SAFE, CLEAN WATER PROGRAM

# FEASIBILITY STUDY REPORT

*Regional Program Projects Module*

| | |
|---|---|
| PROJECT NAME | Metro Orange Line a Water Infiltration and Quality Project |
| PROJECT LEAD(S) | Los Angeles County Metropolitan Transportation Authority |
| SCW WATERSHED AREA | Upper Los Angeles River |
| PRELIMINARY SCORE | 77 |
| TOTAL SCW FUNDING REQUESTED | $ 34,515,458.00 |
| YEAR 1 FUNDING REQUESTED | $ 1,600,000.00 |

**Submitted On: Thursday, October 15, 2020**

**Created By: Curtis Fang, Engineer, Geosyntec Consultants (authorization provided by Melissa Levitt, Senior Environmental Specialist, LA Metro)** (Curtis Fang)

# OVERVIEW

The objective of the Regional Infrastructure Program under the Safe, Clean Water (SCW) Program is to plan, build, and maintain multi-benefit watershed-based projects that improve water quality and increase water supply and/or enhance communities. A Feasibility Study is required before a project can be submitted for consideration and scoring for funding through the Los Angeles Region Safe, Clean Water (SCW) Program's Regional Infrastructure Program. Each Feasibility Study should provide enough information about a potential project to allow the Watershed Area Steering Committee members to make an informed decision for as to which projects should move forward for consideration for funding. The Minimum Feasibility Study Requirements for the Scoring and Consideration of Regional Infrastructure Program Projects is available at: https://portal.safecleanwaterla.org/projects-module/.

This document is based upon an output from the web-based tool called the 'SCW Regional Projects Module' (https://portal.safecleanwaterla.org/projects-module/). This output summarizes the information and data provided to Regional Projects Module, and also provides an initial estimate of project scoring per the SCW Infrastructure Program Project Scoring Criteria.

***IMPORTANT:*** *ALL SCORING ESTIMATES GENERATED BY THE PROJECTS MODULE ARE PRELIMINARY AND SUBJECT TO REVIEW AND REVISION BY THE SCORING COMMITTEE.*

## ORGANIZATIONAL OVERVIEW:

# 1 GENERAL INFORMATION

This section provides general information on the project including location and project description.

## 1.1 Overview

**The following table provides an overview of the project and the Project Developer(s):**

| | |
|---|---|
| Project Name: | Metro Orange Line a Water Infiltration and Quality Project |
| Project Description: | Implement BMPs to improve water quality, recharge groundwater & provide transportation community benefits to disadvantaged communities |
| SCW Watershed Area: | Upper Los Angeles River |
| Call for Projects year: | FY21-22 |
| Total SCW Funding Requested: | $ 34,515,458.00 |
| Phase(s) this application is requesting SCW funding for: | Planning, Design, Construction, O & M |
| Project Weather Type: | Wet |
| Project Lead(s): | Los Angeles County Metropolitan Transportation Authority |
| Additional Project Collaborators: | Los Angeles Department of Water and Power |
| Additional Project Collaborators: | |
| Additional Project Collaborators: | |
| Anticipated IPPD: | Los Angeles County Metropolitan Transportation Authority |
| Is this a non-municipal project? | No |
| Primary Contact (if differs from submitter): | Melissa Levitt, Senior Environmental Specialist, LA Metro |
| Primary Contact Email (if differs from submitter): | LevittM@metro.net |
| Secondary Contact (if differs from submitter): | N/A |
| Secondary Contact Email (if differs from submitter): | N/A |

## 1.2 Project Location

**The following table summarizes the project location:**

| | |
|---|---|
| Latitude: | 34.180319 |
| Longitude: | -118.447016 |
| Street Address: | 6060 Van Nuys Blvd, |
| City: | Los Angeles |
| State: | CA |
| Zip Code: | 91401 |
| Municipality: | Los Angeles |

**Please see the following attachment(s) for a project location map.**

| Attachments for this Section | |
|---|---|
| Attachment Name | Description |
| MOL_Figure1and2_ProjectLoc_DAC_edit.pdf | Figure 1 shows project location and related right-of-way. Figure 2 shows project proximity to DAC |

**Will the project provide benefit to a Disadvantaged Community (DAC)?**

Yes

**If Yes, Distance to nearest DAC.**

0

**If Yes, Describe how the project will provide benefits to a DAC.**

The Project proposes the implementation of infiltration BMPs to mitigate stormwater runoff. As shown in the Figure 2 in the uploaded location map attachment, a majority of the Project drainage area is designated as United States Census Bureau disadvantage communities (DACs). As defined by the California Public Utilities Commission, DACs are disproportionally impacted economically; are more likely to be exposed to environmental hazards, such as air and water pollution; and are more likely to experience health complications, such as asthma and heart disease (California Public Utilities Commission, 2019). The proposed Project will reduce environmental hazards to the community by reducing surface water pollution and will increase the wellbeing of the community by mitigating localized nuisance flooding. In addition, the Project is integrated with the LA Metro Orange Line (MOL) Bus Rapid Transit (BRT) Improvements Project that provides faster and reliable travel and increased ridership to disadvantaged communities, enhances pedestrian safety, and supports the transition to electric bus operation and hence reduces greenhouse gas and air pollutants emissions.

**If Yes, Describe how the project will provide water quality benefits to a DAC.**

As the Project proposes a series of distributed stormwater BMPs, runoff from frequently recurring storms will be captured and infiltrated, thus minimizing untreated discharge to downstream surface water features.

**If Yes, Describe how the project will provide water supply benefits to a DAC.**

The Project also helps to recharge the local groundwater aquifer. Historic over-drafting has depleted this resource, and by promoting recharge, there will be less reliance on imported water.

**If Yes, Describe how the project will provide community investment benefits to a DAC.**

LA Metro will provide approximately $394M in transportation community investments in upgrades to the MOL which will increase bus speeds by 29%, increase ridership by 39%, and improve safety. The electrification of the MOL will eliminate tailpipe emissions of GHGs and criteria air pollutants. The addition of the drywell network to the project will also provide mitigation of localized nuisance flooding resulting from frequently recurring storm events. Additionally, the Project will use a plant palette of California native and locally-adapted drought tolerant vegetation in all landscaping. A detailed plant palette that will be used for the MOL project is uploaded under "Other Feasibility Information" section in this application.

**If Yes, Describe how the project engaged the benefitting DAC(s) to date.**

Several community outreach events have been completed for the MOL BRT Improvements Project in the neighborhood that will benefit from the proposed Project. Two community open house meetings were held on March 26 and 27, 2019. The Project was presented at the San Fernando Valley Service Council Meeting on April 3, 2019. Additionally, pop-up events showcasing the Project were set up at MOL stations throughout 2019.

**Does this project comply with the anti-displacement policies of the Feasibility Study Requirements?**

Yes

**If Yes, Describe how anti-displacement policies were considered.**

As shown in the uploaded location map (Figure 1a through 1g in the upload location maps), a majority of the Project is located within LA Metro owned parcels or right-of-way, and the remaining Project footprint is located within City of Los Angeles Right-of-Way. No impact to residential structures is anticipated. For the construction phase, the Project will lean on experience engaging with small, local contractors to employ a local workforce.

## 1.3 Project Description

| Attachments for this Section | |
|---|---|
| Attachment Name | Description |
| MOL_Factsheet_(2020-10-15).pdf | Project factsheet |

**Which regional water management plan includes the proposed project (SWRP, E/WMP, IRWMP, or other [must identify and justify as equivalent per 18.07.B.1.c.3]):**

The proposed Project is located within the Upper Los Angeles River (ULAR)Watershed. LA Metro has initiated discussion with the ULAR Watershed Management Group (WMG) and has presented the Project concept at the ULAR WMG September monthly meeting, and has demonstrated the proposed Project can achieve the performance target from its drainage area. Detailed discussion on the Project performance can be found under the "Water Quality" section of the application. LA Metro will continue working with the ULAR WMG to incorporate the Project into the ULAR Enhanced Watershed Management Program (EWMP).

**Provide a detailed description and historical background of the project. Please also state which regional water management plan includes the proposed project (SWRP, E/WMP, IRWMP, or other [must identify and justify as equivalent per 18.07.B.1.c.3]):**

The Metro Orange Line (MOL) is an 18-mile Bus Rail Transit (BRT) line that serves the San Fernando Valley from the North Hollywood Red Line station to Chatsworth. Originally opened in 2005 and expanded in 2012, MOL is one of the two LA Metro bus routes that has dedicated lanes on freeways and streets. It is also considered one the busiest BRT lines in the nation with an average of 30,000 passengers every weekday.

In January 2016 the LA Metro Board of Directors (Board) authorized a technical study to assess various improvements to the MOL. In 2017 the Board authorized the MOL BRT Improvements Project, which will improve operating speeds, increase ridership, support the transition to an all-electric bus service, and improve safety, by providing a grade separation structure between Van Nuys to Sepulveda Boulevards, four-quadrant safety gates at at-grade intersections between North Hollywood and Chatsworth Stations, and other improvements. The MOL BRT Improvements Project is expected to be completed by 2025.
Also in 2017, the Board voted to transition to an all-electric bus fleet by 2030. MOL will be one of the first LA Metro routes that will transition to all-electric service by end of 2021.

Recognizing the significant groundwater infiltration and stormwater quality capture potential in the San Fernando Valley, in March 2020, the LA Metro Environmental Compliance & Sustainability Department (ECSD) initiated a feasibility evaluation of LA Metro properties in the area. LA Metro is currently moving forward with the proposed Metro Orange Line Water Infiltration and Quality Project (Project), which will be integrated into and is planned to be constructed as an element of the MOL BRT Improvements Project.

The Project proposes to divert stormwater runoff from existing regional storm drains and from the surface to a network of 168 infiltration drywells across seven locations within Metro properties along the MOL, with pretreatment facilities to capture, treat, and infiltrate stormwater runoff from 2,300 acres, resulting in an estimated groundwater recharge of 890 acre-feet/year into the San Fernando Groundwater Basin. Detailed analysis supporting the groundwater recharge estimate can be in the "Water Supply" section of this application. LA Metro's extensive land holdings and fortuitous siting within the highest value groundwater recharge areas in the region would allow for large-scale infiltration and aquifer recharge. In 2019, LA Metro's total water consumption was 772 acre-feet. The Project has the potential to capture enough stormwater to allow Metro to become net water positive, contributing more water to regional groundwater recharge than it uses to support all of its operations.

The primary objective of the proposed Project is to recharge treated stormwater into the San Fernando Groundwater Basin. Secondary objectives of the proposed Project include improving surface water quality at downstream receiving water (Los Angeles River) and reducing risk of localized flooding by mitigating peak flow rates.

# 2 DESIGN ELEMENTS

This section provides an overview of the project design details.

## 2.1 Configuration

**The following table is a summary of the project configuration:**

| Project Configuration Summary | |
|---|---|
| BMP Type: | Infiltration Well |
| Infiltration Footprint Area: | 0.125 ac |
| Ponding Depth: | 45 ft |
| Media Layer Depth: | 0 ft |
| Media Layer Porosity: | 0 ft |
| Underdrain Layer Depth: | 0 ft |
| Underdrain Layer Porosity: | 0 ft |

| Calculated Storage Volume | |
|---|---|
| Module-generated Storage Volume: | 5.6250 ac-ft |

**Please upload a description and detailed schematic of the project layout including its anticipated footprint and key components such as, but not limited to: inlets, outlets, diversion point, recreational components, nature-based components, pumps, treatment facilities, underdrains, conveyance, above ground improvements, and other project components.**

| Attachments for this Section | |
|---|---|
| Attachment Name | Description |
| MOL_ProjectConfiguration_edit_reduced.pdf | Conceptual drawing of the proposed Project |

## 2.2 Capture Area

**The size and land uses of the capture area upstream of a project plays an important role in its water quality and water supply benefits. The capture area information here is used by the Module for scoring:**

| Capture Area Summary | |
|---|---|
| Capture Area: | 2319 ac |
| Impervious Area: | 1473 ac |
| Pervious Area: | 846 ac |

**The following table is a summary of the land use breakdown for the area that drains to the project:**

| Breakdown of Impervious Acreage in Capture Area | | |
|---|---|---|
| Land Use Type | Percent Impervious | Acres |
| Single Family Residential | 10.1 % | 148.77 |
| Commercial | 8.3 % | 122.26 |

| | | |
|---|---|---|
| Institutional | 51.9 % | 764.49 |
| Multi Family Residential | 5.6 % | 82.49 |
| Secondary Roads and Alleys | 19.5 % | 287.24 |
| Industrial | 3.7 % | 54.5 |
| Urban Open Space | 0.9 % | 13.26 |

**The following table is a breakdown of the municipal jurisdictional areas within the project capture area:**

| Breakdown of the Municipal Jurisdictional Areas within the Project Capture Area | | |
|---|---|---|
| Municipal | Tributary Percent | Acres |
| Los Angeles | 100 % | 2319 |

| Attachments for this Section | |
|---|---|
| Attachment Name | Description |
| MOL_CaptureAreaMap_final.pdf | Map showing project drainage area, landuse and municipal boundary. It also includes a description on how the drainage area is delineated |

**Has a shapefile of the project capture area has been uploaded to the project?**

Yes

## 2.3 Diversion

Diversion Structures generally apply to 'off-line' regional projects where stormwater is diverted from a major water conveyance (e.g., gravity main) and directed to the project at a predetermined maximum rate. Smaller distributed projects, like bioretention, do not normally utilize these devices.

**Does the project have a diversion structure?**

**Yes**

**The following table provides details on the diversion type and maximum diversion rate:**

| Diversion Details | |
|---|---|
| Type of Diversion | Typical Max Diversion Rate (cfs) |
| Pumping | 32 cfs |

**Estimated Average Inflow Captured by Project:**

**19 cfs**

**Description of Diversion:**

Six of the seven proposed BMP clusters (MOL-1, -2, -3, -4, -5 and -7) include active diversion structures (pump stations) where stormwater runoff is diverted and pumped from the storm drain to the infiltration BMPs. The maximum diversion rates range between 10 to 32 cfs to match the maximum capacity of each infiltration BMP cluster. MOL-6 includes a gravity based diversion of stormwater runoff from surface street gutters along Woodman Ave.

When the maximum capacity of each infiltration BMP cluster is reached, the pump station will turn off, allowing stormwater to continue flowing in the storm drain. If a hazardous material spill were to occur upstream, the pump station will be shut down to prevent diverting the spill into the infiltration BMPs.
At a later design stage, the Project may replace the proposed pump stations with gravity driven diversions

pending further hydraulic gradient analysis. The maximum diversion rate and average inflow of the diversion structure will remain unchanged and an equivalent shutoff feature would also be included to prevent potential spills from entering the infiltration BMPs.

## 2.4 Site Conditions & Constraints

**Please provide an upload for each of the attachments below that describes the methods, outcomes and how the information will be incorporated into the project design.:**

Engineering analyses and estimates of existing Project site conditions were performed by reviewing geology maps, topographic data, soil boring logs and Cone Penetration Test (CPT) results collected on-site and nearby, utility mapping, existing condition drainage as-built drawings. Event-based and long-term continuous simulations were performed to characterize the existing hydrologic and water quality condition to assess Project performance. Potential groundwater contaminants were also reviewed by searching for active GeoTracker sites within 0.5 miles of all Project sites and by reviewing relevant EDR reports.

The BMP configuration was developed in accordance with existing drainage as-built, local drainage patterns, and utility mapping. All Project design elements are within LA Metro-owned parcels and public right-of-way (i.e., on and/or underneath the parcel or roadway). Minor alteration to existing storms within Metro right-of-way will be required to construct the BMPs. In addition, six of the BMP clusters require diverting from Los Angeles County-owned storm drains and require active pumping to overcome the hydraulic head and divert stormwater to the BMP clusters. The diversion pipe will cross existing sewer lines at MOL-4 and MOL-7. For these two locations the diversion pipes will be placed deeper than the sewer lines to avoid interference. No other utility conflicts are identified to date. The diversion point may also be adjusted pending additional surveying and potholing investigation during the design stage.

Based on review of available geotechnical data, geophysical constraints that prevent stormwater infiltration are either not present at the project site (e.g. landslide potential, slope instability, expansive soil, surcharge on adjacent structures) or can be mitigated (e.g. liquefaction). Based on review of geologic map, available boring logs and cone penetration test (CPT) results collected on or near the Project site, the infiltration wells at proposed Project sites are expected to perform well and achieve an 0.8 cfs infiltration rate per well on average.

Since the Project consists of seven BMP sites with independent drainage areas, the SCW online module’s built-in modeling tool cannot be utilized. Instead, Los Angeles County’s Watershed Management System 2.0 (WMMS 2.0) was used to characterize annual average runoff quantity and pollutant loading, assess project performance during a 24-hour, 85th percentile storm, and assess the long-term water quality and water supply benefits of the project over a 10-year continuous simulation between 10/1/2008 and 09/30/2018. According to the model output, the proposed Project is estimated to capture 91% runoff volume from a 24-hour, 85th percentile design storm, achieve 65% primary and secondary pollutant load reduction on an annual basis, and recharge 890 ac-feet of runoff into the San Fernando Groundwater Basin on an annual basis.

Based on review of the GeoTracker database and EDR report, there are active remediation efforts on volatile organic compounds and non-petroleum hydrocarbons within 0.5 miles of the proposed BMP sites. No significant contaminant plume was identified beneath the proposed BMP sites. Therefore, the risk of the proposed BMP introducing additional contaminants into the San Fernando Valley Groundwater Basin is low.

Detailed analysis methodology, assumptions, and results supporting the findings above can be found in the uploaded attachments below.

**Does the project involve LACFCD infrastructure, facilities, or right-of-way?**

Yes

**Please see the following attachments for additional details on geotechnical, hydrology, right-of-way and/or LACFCD, and utility conditions.**

| Attachments for this Section | |
|---|---|
| Attachment Name | Description |

| | |
|---|---|
| MOL_Geotechnical_Review_Final_Reduced.pdf | Main geotechnical review report with figures |
| MOL_Geotech_Appendix A.pdf | Geotechnical Review Report Appendix A |
| MOL_Geotech_Appendix B.pdf | Geotechnical Review Report Appendix B |
| MOL_Geotech_Appendix C.pdf | Geotechnical Review Report Appendix C |
| MOL_Geotech_Appendix D.pdf | Geotechnical Review Report Appendix D |
| MOL_Geotech_Appendix E_Reduced.pdf | Geotechnical Review Report Appendix E |
| MOL_Geotech_Appendix F.pdf | Geotechnical Review Report Appendix F |
| MOL_Geotech_Appendix G.pdf | Geotechnical Review Report Appendix G |
| MOL_Geotech_Appendix H_Reduced.pdf | Geotechnical Review Report Appendix H |

| Attachments for this Section | |
|---|---|
| Attachment Name | Description |
| MOL_ExistingHydrology.pdf | Existing hydrology and water quality condition characterization |

| Attachments for this Section | |
|---|---|
| Attachment Name | Description |
| MOL_LACFCD_Confirmation.pdf | Email communication with LACFCD confirming a letter of conceptual approval is under preparation |
| GO.Metro Orange Line- Conceptual Approval1.pdf | Notice of Conceptual Approval from LACFCD |

| Attachments for this Section | |
|---|---|
| Attachment Name | Description |
| MOL_Utility Review_Final.pdf | Summary of utility review findings |

## 2.5 Monitoring

This section provides an overview of monitoring data related to the project.

**Has any monitoring data been compiled related to the project?**

**No**

**Please provide an overview of the monitoring performed to date:**

N/A

**Please upload a monitoring plan to measure the effectiveness of the proposed project once completed, including metrics specific to the identified benefits. Also attach supplemental information on monitoring conducted to date, if applicable.**

| Attachments for this Section | |
|---|---|
| Attachment Name | Description |
| MOL_Monitoring_Plan_Final_Compiled.pdf | Project monitoring plan |

## 2.6 O & M

**Provide an overview of the plan for how operations and maintenance of the Project will be carried out. Identify the responsible party and describe any technical expertise required for O&M.**

O&M of the stormwater BMP is anticipated to begin June 2024. LA Metro will be responsible for the O&M. Project components that require O&M include drywells, pretreatment facilities, and diversion structures/pump stations. O&M activities and associated frequencies and cost are determined based on past experience with similar projects implemented by LA Metro's teaming partners (LADWP, Geosyntec Consultants), and on practical insights provided by drywell, pretreatment facility and pump vendors.

The O&M Plan provided below is commensurate with the Project's current level of detail.

| Attachments for this Section | |
|---|---|
| Attachment Name | Description |
| MOL_O&M_Plan.pdf | Operation and maintenance plan for the proposed Project |

# 3 WATER QUALITY BENEFITS

This section provides an overview of project elements related to water quality benefits, including calculations used for Section A (Water Quality Benefits) of SCW Project Scoring Criteria.

## 3.1 MS4 Compliance

**Please describe in detail how the project will support achievement of compliance with MS4 Permit including applicable TMDLs, role with Watershed Management Program, etc. Please clearly specify if this project is being developed as part of a Time Schedule Order for the MS4 Permit. SCW funds may be used for projects implemented pursuant to a TSO issued by the LA Regional Water Quality Control Board provided that, at the time the TSO is issued, the project is included in an approved watershed management program developed pursuant to the MS4 Permit:**

The proposed Project will support achievement of compliance with the MS4 Permit by contributing to the ULAR EWMP, including contributing to compliance with the following TMDLs:
- Los Angeles River Nutrients TMDL
- Los Angeles River Trash TMDL
- Los Angeles Metals TMDL
- Los Angeles River Bacteria TMDL

In reference to the ULAR EWMP implementation strategy, the proposed Project captures, treats and infiltrates stormwater runoff from the following ULAR EWMP jurisheds: 685949, 686149, 685049, 685649, 684449 and 683949. The annual pollutant target load reduction of these jurisheds range between 7% to 63%, and the cumulative 24-hour runoff management target for all referenced jurisheds is 106.5 acre-feet.

According to the WMMS 2.0 modeling output, the proposed Project can achieve over 65% pollutant load reduction on an annual basis and provide 268 acre-feet of 24-hour runoff management capacity. Therefore, the proposed Project has the potential to significantly contribute to meeting both pollutant target load reduction and 24-hour runoff management capacity targets within its drainage area.

Detailed information supporting the 24-hour stormwater management capacity and pollutant load reduction can be found in the supporting documentations uploaded in “Long-Term Performance” and “24-Hour Storm Capacity” sections below respectively.

The proposed Project was not developed as part of a Time Schedule Order for the MS4 Permit.

## 3.2 24-hour Storm Capacity

**Please enter information below regarding key parameters of the project's capacity. The Module will use those values to estimate the 24-hour capacity:**

| 24-hour Storm Capacity Breakdown | |
|---|---|
| Effective Draw Down Rate: | 0 in/hr |
| Stormwater Use During 24-hr Design Event: | 0 gal |

| Calculated 24-hour Storm Capacity | |
|---|---|
| Module-generated 24-hr Capacity: | 5.6250 ac-ft |
| Use Project Developer estimate instead? | Yes |
| Custom Value specified by User: | 268 ac-ft |
| Please provide a description of methods used to calculate 24-hour capacity, and attach supplemental information with details of the methodology, assumptions and calculations. | The 24-hour capacity is computed as the sum of the static storage capacity provided by all drywells and the 24-hour cumulative infiltration volume through all drywells. Detail calculation is included in the attached PDF. |

| Attachments for this Section | |
|---|---|
| Attachment Name | Description |
| MOL_24-Hour Capacity_Final.pdf | 24-Hour Capacity calculation methodology and result |

## 3.3 Event-based Design Details

n this section, details regarding the project inlets and outlets are provided, along with estimates generated for the project design event. The event-based information is envisioned as basic estimates that would be generated during the project design, and will support review of the project details.

**Estimated Total Inflow Volume during Design Event:**

142 ac-ft

**Describe the event used for project design. Describe the portion of the peak inflow that would be retained by the project through infiltration, capture, diversion, use, or other means. Tooltip for 'Treatment Description' under outlets:**

The 85th percentile, 24-hour storm is used as the design storm.

**Describe whether and how the 85th percentile is being captured/diverted. If not, is there opportunity to do so? If feasible but not incorporated, explain why. If not feasible, explain why.**

According to the event-based hydrologic simulation, the proposed Project, which consists of 168 drywells, can capture 91% of the runoff from the drainage area produced during the 85th-percentile 24-hour design storm. An additional 137 drywells will be needed to fully capture the runoff from the 85th-percentile 24-hour design storm. It is infeasible to accommodate the additional drywells within LA Metro-owned parcels and right-of-way and without interfering with the normal operation of the MOL BRT.

**The following tables detail inflow and outflow from the project during the design event:**

| Inlets | |
|---|---|
| Estimated Max Inflow Rate (cfs) | Total Inflow (ac-ft) |
| 33 cfs | 18 ac-ft |
| 81 cfs | 44 ac-ft |
| 27 cfs | 15 ac-ft |
| 67 cfs | 37 ac-ft |
| 17 cfs | 9 ac-ft |
| 8 cfs | 4 ac-ft |
| 26 cfs | 14 ac-ft |

| **Outlets** | | | |
|---|---|---|---|
| Estimated Max Outflow Rate (cfs) | Treated? | Treatment Description | Percent of Volume Treated (%) |
| 17 cfs | Yes | Infiltrated runoff by Drywell Cluster MOL-1 during the design storm | 94 % |
| 1 cfs | No | N/A | N/A |
| 38 cfs | Yes | Infiltrated runoff by Drywell Cluster MOL-2 during the design storm | 86 % |
| 7 cfs | No | N/A | N/A |
| 13 cfs | Yes | Infiltrated runoff by Drywell Cluster MOL-3 during the design storm | 87 % |
| 2 cfs | No | N/A | N/A |

| | | | |
|---|---|---|---|
| 33 cfs | Yes | Infiltrated runoff by Drywell Cluster MOL-4 during the design storm | 89 % |
| 4 cfs | No | N/A | N/A |
| 9 cfs | Yes | Infiltrated runoff by Drywell Cluster MOL-5 during the design storm | 100 % |
| 0 cfs | No | N/A | N/A |
| 4 cfs | Yes | Infiltrated runoff by Drywell Cluster MOL-6 during the design storm | 100 % |
| 0 cfs | No | N/A | N/A |
| 14 cfs | Yes | Infiltrated runoff by Drywell Cluster MOL-7 during the design storm | 100 % |
| 0 cfs | No | N/A | N/A |

### Describe the methods used to generate estimates:

Inflow and outflow volumes and peak flow rates were estimated using event-based hydrology and BMP routing simulation using WMMS 2.0. Detailed model methodology, assumptions, inputs and outputs can be found in the supporting documentation uploaded below. Location of inlet and outlet can be found in the conceptual drawing uploaded in the "Design Elements – Configuration" section of the application.

| Attachments for this Section | |
|---|---|
| Attachment Name | Description |
| MOL_EventBasedHydrologicModeling.pdf | Supporting documentation for the even-based hydrologic modeling |

## 3.4 Long-term Performance

This section present details of the calculation of long term (10-year) water quality benefit for Section A.1.2 (Water Quality Benefit) of SCW Project Scoring Criteria.  These estimates were either generated by the Module using a 10-year hourly simulation with the Watershed Management Modeling System (WMMS), or generated by the Project Developer.

**The following tables present selected primary and secondary pollutants and calculated reductions for water quality benefit per Section A.1.2 (Water Quality Benefit) of SCW Project Scoring Criteria.**

*Note: these estimates are based on the hourly 10-year WMMS simulation performed by the Module, or as estimated by the Project Developer.*

| Primary Pollutant | |
|---|---|
| Primary Pollutant | Total Zinc |
| Reduction Method used for Scoring | Method 2 (% Load Reduction) |
| Justification for selecting Primary Pollutant | Limiting pollutant identified in the ULAR EWMP |
| Calculated 10-year Pollutant Reduction | 97.9 |
| Use Project Developer estimate instead? | Yes |
| Own Value | 65 % |
| Justification for using own value | Limiting pollutant identified in the ULAR EWMP |
| **Secondary Pollutant** | |
| Secondary Pollutant | Bacteria |
| Reduction Method used for Scoring | Method 2 (% Load Reduction) |
| Justification for selecting Secondary Pollutant | Limiting pollutant identified in the ULAR EWMP |
| Calculated 10-year Pollutant Reduction | 70.9 |
| Use Project Developer estimate instead? | Yes |
| Own Value | 65 % |
| Justification for using own value | Limiting pollutant identified in the ULAR EWMP. Please  refer to the PDF uploaded under "Primary Pollutant" for supporting documentation |

**The following table presents calculated water quality benefit achieved by the project based on the hourly 10-year WMMS simulation performed by the Module, for all the simulated pollutants.**

*Note: this output includes all pollutants and methods, including those not selected as Primary or Secondary for scoring.*

| Pollutant Name | Method 1 (% Concentration Reduction) | Method 2 (% Load Reduction) | Method 3 (% Exceedance Reduction) |
|---|---|---|---|
| Total Zinc | 6.8 % | 6.9 % | N/A |
| Total Copper | 6.5 % | 6.6 % | N/A |
| Total Lead | 4.4 % | 4.5 % | N/A |
| Total Nitrogen | 15.6 % | 15.7 % | N/A |
| Total Phosphorous | 12.2 % | 12.3 % | N/A |
| *E.coli* | 5.3 % | 5.4 % | N/A |
| Toxics | N/A | N/A | N/A |
| Chloride | N/A | N/A | N/A |
| Trash | N/A | N/A | N/A |
| N/A = Modeling results not available from Projects Module, must be manually generated by user | | | |

**The following table presents inflow and outflow details for calculated water quality benefit achieved by the project based on the hourly 10-year WMMS simulation performed by the Module, for all the simulated pollutants.**

*Note: this output includes pollutants not selected as Primary or Secondary for scoring, and reduction methods not selected for scoring.*

| Metric | Runoff from Capture Area | Minimally Treated Outflow from Project | Inflow into Project Inlet | Outflow from Project Outlet | Reduction by Project | % Reduction by Project |
|---|---|---|---|---|---|---|
| Runoff Volume (ac-ft) | 1179.471 | 816.036 | 816.602 | 816.036 | 0.565 | 0.069 % |
| Total Zinc (ug/L) | 298.580 | 260.350 | 279.380 | 260.350 | 19.030 | 6.812 % |
| Total Zinc (lbs) | 957.664 | 577.736 | 620.411 | 577.736 | 42.675 | 6.879 % |
| Total Copper (ug/L) | 65.830 | 58.000 | 62.030 | 58.000 | 4.030 | 6.497 % |
| Total Copper (lbs) | 211.139 | 128.717 | 137.744 | 128.717 | 9.027 | 6.554 % |
| Total Lead (ug/L) | 45.390 | 40.130 | 41.980 | 40.130 | 1.850 | 4.407 % |
| Total Lead (lbs) | 145.584 | 89.053 | 93.217 | 89.053 | 4.164 | 4.467 % |
| Total Nitrogen (mg/L) | 3.478 | 2.994 | 3.548 | 2.994 | 0.554 | 15.617 % |
| Total Nitrogen (lbs) | 11153.808 | 6644.543 | 7879.730 | 6644.543 | 1235.187 | 15.675 % |
| Total Phosphorous (mg/L) | 0.527 | 0.464 | 0.529 | 0.464 | 0.065 | 12.206 % |
| Total Phosphorous (lbs) | 1690.565 | 1030.023 | 1174.034 | 1030.023 | 144.011 | 12.266 % |
| E.coli (#/100mL) | 6.655E+004 | 6.108E+004 | 6.450E+004 | 6.108E+004 | 3.421E+003 | 5.304 % |
| E.coli (#) | 9.681E+014 | 6.147E+014 | 6.496E+014 | 6.147E+014 | 3.488E+013 | 5.370 % |
| Toxics | N/A | N/A | N/A | N/A | N/A | N/A |
| Chloride | N/A | N/A | N/A | N/A | N/A | N/A |
| Trash | N/A | N/A | N/A | N/A | N/A | N/A |
| N/A Modeling results not available from Projects Module, must be manually generated by user | | | | | | |

| Attachments for this Section | |
|---|---|
| Attachment Name | Description |
| MOL_LongTermHydrologicModeling.pdf | Supporting documentation for the long-term hydrologic modeling |

# 4 WATER SUPPLY BENEFITS

This section provides an overview of project elements related to water supply benefits, including calculations used for Section B (Significant Water Supply Benefits) of SCW Project Scoring Criteria.

## 4.1 Water Supply Nexus

**Please describe and clearly justify the nexus between water supply and the stormwater and/or urban runoff that is captured/infiltrated/diverted by the Project:**

The benefit claimed will result from increasing water supply as infiltrated water reaches the San Fernando Valley Basin groundwater aquifer. The project does not directly offset potable demand.

**Does this project capture water for onsite irrigation use?**

No

**Description of onsite use by the project:**

N/A

**Does this project capture water used for water recycling by a wastewater treatment facility?**

No

**Description of water recycling by the project:**

N/A

**Is the project connected to a managed water supply aquifer?**

Yes

**If Yes, managed Aquifer Name:**

San Fernando Valley Groundwater Basin

**If this project is augmenting groundwater supply, please provide confirmation that the agency managing the groundwater basin concurs with the added benefit.**

| Attachments for this Section | |
|---|---|
| Attachment Name | Description |
| scanner@ladwp.com_20201015_142907.pdf | Letter of acknowledgement from LADWP. In addition, LA Metro has also initiated discussion with ULARA Watermaster for conceptual approval. |
| LID Review Letter - Metro Orange Line Project.pdf | LID Review letter from ULARA Watermaster confirming no objection to the proposed project |

## 4.2 Benefit Magnitude

Project Scoring Criteria Section B is based upon estimates of annual average water supply benefit. Water supply benefit can include, but is not limited to, water diverted to a separate groundwater recharge facility, into a water treatment plant, to a sanitary sewer to be converted into recycled water, etc. This section provides documentation of estimates of annual average water supply benefit.

**Average dry weather inflow to project:**

0.1 cfs

**Describe the methods used to estimate average dry weather inflow to the project:**

The annual average recharge volume and inflow rate were estimated based on the continuous hydrologic and BMP routing simulation using WMMS 2.0. Detailed model methodology, assumptions, inputs and outputs can be found in the supporting documentation for the long-term hydrologic modeling (Uploaded under "Water Quality -> Long-Term Performance" section of this application)

**The following tables present calculated annual inflow the project.**

*Note these estimates are based on an hourly 20-year hourly WMMS simulation performed by the Module, or as estimated by the Project Developer.*

| Module-generated annual average inflow to project: | 816.602 ac-ft |
|---|---|
| Use Project Developer estimate instead? | Yes |
| Custom Value specified by User: | 1350 ac-ft |

| | |
|---|---|
| Please provide a description of methods used to calculate water supply inflow values | The Project's annual average inflow/capture volume is computed as the sum of the average annual runoff captured by all BMP sites. The estimate is based on the modeling output using a continuous hydrology and BMP routing simulation using WMMS 2.0. Detailed model methodology, assumptions, inputs and outputs can be found in the supporting documentation for the long-term hydrologic modeling (Uploaded under "Water Quality - Long-Term Performance" section of this application) |
| Supporting PDF | See attached PDF if applicable. |

**The following tables present calculated annual average capture by the project, which is used for the Section B2 scoring calculation (Benefit Magnitude of SCW Scoring Criteria).**

*Note these estimates are based on an hourly 20-year hourly WMMS simulation performed by the Module, or as estimated by the Project Developer.*

| Module-generated annual average capture for water supply: | 0.565 ac-ft |
|---|---|
| Use Project Developer estimate instead? | Yes |
| Custom Value specified by User: | 890 ac-ft |

| | |
|---|---|
| Please provide a description of methods used to calculate water supply benefit | The Project's annual average inflow/capture volume is computed as the sum of the average annual runoff captured by all BMP sites. The estimate is based on the modeling output using a continuous hydrology and BMP routing simulation using WMMS 2.0. Detailed model methodology, assumptions, inputs and outputs can be found in the supporting documentation for the long-term hydrologic modeling (Uploaded under "Water Quality -> Long-Term Performance" section of this application) |
| Supporting PDF | See attached PDF if applicable. |

## 4.3 Cost Effectiveness

Project Scoring Criteria Section B2 incorporates life-cycle costs. The cost-effectiveness for water supply benefit is calculated from other sections in the Module. The calculation for B2 scoring is based on a numerator of life-cycle cost (from Design Elements > Cost) and a denominator of annual average benefit magnitude (from Water Supply > Benefit Magnitude).

| Module-generated water supply cost-effectiveness: | $ 2,742.28 per ac-ft |
|---|---|
| Use Project Developer estimate instead? | Yes |
| Custom Value specified by User: | $ 2219 ac-ft |

|  |  |
|---|---|
| Justification | We propose to consider the additional benefit on the secured cost-share we have brought into the project in assessing the project’s cost effectiveness and computing the cost effectiveness based on the life cycle cost that is calculated by excluding the committed cost share. Additional information on the estimated value is uploaded below. |
| Supporting PDF | See attached PDF if applicable. |

| Attachments for this Section | |
|---|---|
| Attachment Name | Description |
| MOL_CostEstimate&CostEffectiveness.pdf | Supporting documentation on the cost effectiveness calculation |

# 5 COMMUNITY INVESTMENT & LOCAL SUPPORT BENEFITS

## 5.1 Community Investment

This section provides an overview of project elements related to community investment benefits, which are used in calculations for Section C (Community Investment Benefits) of SCW Project Scoring Criteria.

**The following table details the project's community investment benefits:**

| Community Investment | | |
|---|---|---|
| Investment Type | Applicable? | Detailed Description |
| Does this project improve flood management, flood conveyance, or flood risk mitigation? | Yes | The Project proposes to divert a significant portion of stormwater runoff from six regional storm drains and from a major road intersection that has local flooding issues (Woodman Ave.). The proposed Project can help reduce overall peak flows and the risk of potential localized flooding, and restores capacity to the drainage system downstream. Additional documentation supporting the Project's flood risk mitigation benefit is uploaded below. |
| Does this project create, enhance, or restore park space, habitat, or wetland space? | No | N/A |
| Does this project improve public access to waterways? | Yes | The Project is part of the MOL BRT Improvements Project, which provides an improved, safer pedestrian and bike path, increased bus speeds, and improved ridership and capacity that will provide multi-modal access for local communities in San Fernando Valley to Los Angeles River and other waterways in Los Angeles County. Additional information on the project' impact on improving public access to waterways is included in the community open house meeting presentation below. |
| Does this project create or enhance new recreational opportunities? | Yes | The Project is part of the MOL BRT Improvements, which includes grade separation and gating throughout the Metro Orange Line to enhance the safety of bicyclists and pedestrians who utilize the Orange Line bike path for recreational uses. Additional information on the project' impact on improving public access to waterways is included in the community open house meeting presentation below. |
| Does this project create or enhance green spaces at school? | No | N/A |
| Does this project reduce heat local island effect and increase shade? | No | N/A |

| | | |
|---|---|---|
| Does this project increase shade or the number of trees or other vegetation at the site location? | No | N/A |

## 5.2 Local Support

**Please describe any prior outreach and engagement conducted for this project:**

The MOL BRT Improvements Project held a series of project kick-off open houses in late November and early December 2017, which served as the first round of public involvement. In March 2018, in partnership with the San Fernando Valley Council of Governments, Metro hosted a half-day tour of the Metro Expo Line for approximately 30 elected and city staff, as well as local transit advocates. In June 2018, Metro held community open houses in Van Nuys and North Hollywood to provide stakeholders with an update on Metro projects in the San Fernando Valley. Two community open house meetings were held on March 26 and 27, 2019 in Canoga Park and North Hollywood to present an update on the project, including details on the pilot gate, grade separations, and traffic/noise analysis. The Project was presented at the San Fernando Valley Service Council Meeting on April 3, 2019. Additionally, pop-up events showcasing the Project were set up at MOL stations throughout 2019.

In 2020 LA Metro engaged several key stakeholders in the development of the MOL Water Infiltration and Quality Project. This included targeted discussions with agencies such as LADWP, LA Sanitation, and StreetsLA and community organizations, such as Climate Resolve, Council for Watershed Health, and the NRDC.

**Please describe the Outreach Plan for this project moving forward:**

Additional community outreach events will be held during the Project planning and design phases to increase Project awareness within the local community and provide opportunities for input. Educational information and signage will be developed to educate the public on the infiltration system and water supply and quality benefits provided to the community.

**Does this demonstrate strong local, community-based support?**

Yes

**The following table details the support by local, community-based organizations for the project** (also see attachments)**:**

| Local Support | | |
|---|---|---|
| Organization Name | Description | PDF |

| | | |
|---|---|---|
| Climate Resolve, Council for Watershed Health | The project has a high level of interest and support from the local communities, City and County of Los Angeles, and local non-government organizations. Two letters of support from NGOs (Climate Resolve, Council for Watershed Health) are provided in support of this application. Additional community meeting contents and minutes for the prior outreach described above are also included in support of this application. The Project generated a high level of interest from local community supports because it promotes safer and more reliable traveling using MOL, MOL bike paths and MOL pedestrian paths, and supports the transition to fully electrifying the MOL bus fleet with zero emission electric buses. | MOL_LetterOfSupport_Final_Reduced.pdf |
| Natural Resources Defense Council (NRDC) | Support Letter from NRDC | NRDC MOL letter of support.pdf |

# 6 NATURE-BASED SOLUTIONS

This section provides an overview of project elements that leverage nature-based solutions, which are used in calculations for Section D (Nature-Based Solutions) of SCW Project Scoring Criteria.

**Does this project implement natural processes?**

Yes

**Natural Processes Description:**

Prior to development, stormwater would infiltrate into the ground as it flowed across permeable surfaces. In general, the typical response at a given watershed outfall is a slow, shallow curve.

In the existing post-development condition, stormwater flows across impermeable surfaces until it is collected into “grey” stormwater infrastructure (i.e. storm drains) and transported to an outfall – in this case, the Los Angeles River, which is also largely impervious. The flow at a given watershed outfall therefore responds to precipitation in a fast and sharp curve. This increase of impervious surface results in localized flooding, as well as losing the benefit of groundwater recharge.

In the proposed Project, stormwater will be infiltrated as it is collected in drywells. The precipitation-runoff response curve will be a corrected toward the natural, pre-development condition.

**Does this project utilize natural materials?**

Yes

**Natural Materials Description:**

The infiltration BMPs use natural material such as gravels for natural filtration of the captured stormwater. In addition, landscape areas that are disturbed by the construction of the MOL BRT Improvement Project will be restored with California native, drought-tolerant shrubs and trees such as Blue Palo Verde, California Walnut, Coast Live Oak, Mexican Palo Verde, Valley Oak, Western Cottonwood and Western Sycamore.

**Description of how nature-based solutions are utilized to the maximum extent feasible. If nature-based solutions are not used, include a description of what options where considered and why they were not included.**

Drywells use the natural process of infiltration to shift the area’s precipitation-runoff response curve closer to the natural, pre-development condition.

Drywells allow for small pockets of very high infiltration, enabling the area to mimic a natural stormwater response in a space-effective way without needing to remove large amounts of existing impervious surface. Drywells were also sited to not overlap with other existing or proposed infiltration projects. As a result, the extent of the Project is unique and intentional, as it provides geographic connectivity with the tributary watershed areas for those other projects.

**The following table details the impermeable area removed by the project:**

| Removed Impermeable Area by Project | |
|---|---|
| Pre-Project Impervious Area: | Post-Project Impervious Area: |
| 1473 ac | 1473 ac |

# 7 COST & SCHEDULE

This section provides an overview of the project's funding and community support, which are used in calculations for Section E (Leverage Funds and Community Support) of SCW Project Scoring Criteria.

## 7.1 Cost & Schedule

**The following tables provide details on the project's phase and annualized costs:**

| Phase Costs | | | |
|---|---|---|---|
| Phase | Description | Cost | Completion Date |
| Planning | Planning includes early concept design, site investigations, and CEQA and other environmental impact studies and permitting | $ 241,000.00 | 05/2021 |
| Design | Design includes, pre-project monitoring, site investigations, formal project design, intermediate and final project completion audits. | $ 2,153,000.00 | 06/2022 |
| Construction | Construction cost includes the cost of labor, equipment, material, plus overhead and contingencies. In addition, it includes the present value of 2-years post-construction monitoring. | $ 27,829,000.00 | 06/2025 |
| Total Funding: | | $ 30,223,000.00 | |

| Annual Cost Breakdown | |
|---|---|
| Annual Maintenance Cost: | $ 741,000.00 |
| Annual Operation Cost: | $ 82,000.00 |
| Annual Monitoring Cost: | $ 0.00 |
| Project Life Span: | 30 years |

**The following table provide details on calculated life-cycle costs for the project** (either calculated the Module, or estimated by the Project Developer)**.**

*Note: these life-cycle costs are used in Section 4.3 of this output for Water Supply Benefit scoring.*

| | |
|---|---|
| Module-generated Life-Cycle Cost for Project* | $ 45,599,521.35 |
| Module-generated Annualized Cost for Project* | $ 2,440,630.44 |
| Use Project Developer estimate instead? | No |
| Custom Value specified by User: | N/A |
| Please provide a description of methods used to calculate Life Cycle costs, and attach supplemental information with details of the methodology, assumptions and calculations: | N/A |
| Supporting PDF | See attachment if applicable. |

*Applies an annual discount rate as a static rate equal to 3.375%. The only costs not included in total life-cycle cost are the dismantling and replacement costs at the end of life.

## 7.2 Cost Share

**Is additional funding being provided as a Cost Share for this project?**

Yes

**The following is a summary of what other sources of funding were explored and/or why funding could not be secured through these other sources:**

LA Metro acknowledges that eligible expenditures for this project are only incurred after November 7, 2018.

LA Metro has secured a funding from LADWP via cost-share agreement. Although no other funding is secured prior to the application deadline, LA Metro will continue exploring additional funding opportunities, including Proposition 1 and Measure A.

**The following table details the additional funding attained for the project:**

| Additional Funding | | | | |
|---|---|---|---|---|
| Type of Cost Share | Sub-Phase Description | Funding Amount | Funding Status | PDF |
| Agreements | LA Metro has secured a funding from LADWP via cost-share agreement. If the Project is approved by Measure W, LA Metro will work with LADWP to produce a fund transfer agreement, which will includes details on fund transfer schedule and timeline. | $ 11,088,000.00 | Commitment Received | scanner@ladwp.com_20201015_142907.pdf |
| Total Funding: | | $ 11,088,000.00 | | |

## 7.3 Funding Request

**Total funding requested**

$ 34,515,458.00

**The following table shows the requested schedule of funding (by Year and Phase) to create a summary table. A breakdown for the first five years must be provided. The schedule of funding must also match the Requested Funding. In most cases, the entries will not add up to the estimated Life-Cycle cost, as Applicants are discouraged from including long-term O&M costs beyond five years in the funding request.**

| Funding Requested by Year & Phase | | | |
|---|---|---|---|
| Year | SCW Funding Requested | Phase | Efforts during Phase and Year |
| Year 1 | $ 241,000.00 | Planning | Early concept design, site investigations, and CEQA and other environmental impact studies |
| Year 1 | $ 1,359,000.00 | Design | Pre-project monitoring, site investigations, formal project design, intermediate and final project completion audits, CEQA and other environmental impact studies, and permitting |
| Total Year 1 | $ 1,600,000.00 | | |
| Year 2 | $ 5,070,400.00 | Construction | Project construction |
| Total Year 2 | $ 5,070,400.00 | | |
| Year 3 | $ 6,000,000.00 | Construction | Project construction |
| Total Year 3 | $ 6,000,000.00 | | |
| Year 4 | $ 6,464,800.00 | Construction | Project construction |
| Year 4 | $ 823,200.00 | O & M | Operation and maintenance of pump stations, drywells, and pretreatment facilities |
| Total Year 4 | $ 7,288,000.00 | | |
| Year 5 | $ 823,200.00 | O & M | Operation and maintenance of pump stations, drywells, and pretreatment facilities |
| Total Year 5 | $ 823,200.00 | | |

| | | | |
|---|---|---|---|
| Funding requested beyond 5 years | $ 13,733,858.00 | O & M | Present values of 28-years of operation and maintenance of pump stations, drywells, and pretreatment facilities |
| Total Funding requested beyond 5 years | $ 13,733,858.00 | | |
| Total Funding: | $ 34,515,458.00 | | |

# 8 ADDITIONAL FEASIBILITY INFORMATION

This section presents additional information regarding project feasibility and technical details gathered during project design and feasibility assessment.

## 8.1 Environmental Documents and Permits

**Environmental Documentation:**

1. **Identify the lead agency for the Project per CEQA.**
2. **Identify environmental documentation (e.g. EIR, MND, ND, Exemption) that has been completed or will be prepared for the Project.**
3. **Discuss the current status and schedule for preparation and notification of environmental documentation.**
4. **State if NEPA is required and identify the lead agency under NEPA, and environmental document (e.g. EIS, FONSI, Categorical Exclusion) that has been completed or will be prepared for the Project.**

The anticipated level of CEQA environmental document is a Mitigated Negative Declaration. LA Metro will be the lead agency for the Project.
Potential environmental impacts have been assessed and are summarized in attached PDF below.

Environmental documentation will begin after the project secures Safe, Clean Water Program funding.

NEPA is not required, as there are no federal funds.

**Permitting:**

- **Describe all permit requirements including for the Flood Control permit. Discuss anticipated challenges associated with obtaining permits ie. time and cost. A Flood Control Permit (obtained through epicla.lacounty.gov) is required for any project affecting LACFCD right-of-way and/or facility.**
- **If a Flood Control Permit is required:**
  - **Describe how the project will affect LACFCD right-of-way and/or facility.**
  - **Provide a planning-level schedule showing the time allotted for permit review and issuance in the context of the overall project planning and delivery process**.

A permit will be needed from LACFCD to connect to the six County-operated storm drains. The Project will not negatively affect the County storm drain, as the Project will not introduce additional runoff into the storm drains. A detailed hydraulic analysis will be performed to demonstrate the proposed diversion structures will not affect the storm drain conveyance capacity upon permit application.
The current estimated cost of the environmental document and permitting is percentage-based, at 10% of the Planning and Design Capital.

LACFCD permit application is expected to begin in conjunction with the design phase (May 2021). The permit will be obtained prior to the construction starting June 2022.

| Attachments for this Section | |
|---|---|
| Attachment Name | Description |
| MOL_CEQA_Environmental_Checklist.pdf | CEQA Checklist for the Proposed Project |

## 8.2 Vector Minimization

This following provides details on vector minimization strategies.

**Does the project have vector minimization plan?**

Yes

**Provide a description of the vector minimization plan.**

Control of mosquitos and other vectors in stormwater management BMPs is critical for protecting public health. The State of California Health and Human Services Agency's Checklist for Minimizing Vector Production in Stormwater Management Structures was used to evaluate opportunities to minimize the proliferation of vectors.

The proposed Project is completely underground and is designed to drain fully in 48 hours (i.e. no standing water 48 hours after rainfall). Proper O&M Plan implementation is expected to mitigate many of the risks for vector proliferation.

**Please see an attachment with proposed vector minimization plan.**

| Attachments for this Section | |
|---|---|
| Attachment Name | Description |
| MOL_Vector Minimization Plan_Final.pdf | Vector Minimization Plan for the proposed Project |

## 8.3 Alternatives Studied

**Describe alternatives that were considered and evaluated as part of the Project development:**

The main objectives of the project are to improve surface water quality, enhance water supply through capture and infiltration, and reduce localized flooding. Drywells were selected as the primary Project design element to achieve these goals in a fully developed, highly urbanized area.

Other types of stormwater capture devices or green infrastructure, such as bioretention biofiltration or large infiltration galleries, require substantial amounts of land area. As the proposed Project is required to minimize above-surface features in LA Metro-owned parcels and right-of-way in order minimize conflicts with existing land uses, surface features like these are therefore not feasible for this project.

The locations of the proposed drywells were carefully evaluated for compatibility with existing streetscapes, storm drain infrastructure, utilities, surface flow patterns, and known localized flooding patterns.

## 8.4 Effectiveness

**Describe the effectiveness of similar types of projects already constructed if applicable:**

A nearby directly comparable project is the Van Nuys Green Streets Project, completed in January 2019, which installed 21 drywells and 20 porous gutters to treat 100 acres of drainage area for a budget of $3.4 million. According to the post-construction monitoring report, the drywells can effectively capture and infiltrate stormwater runoff up to its design infiltration capacity during the monitored rainfall events, and can recharge 50 ac-ft stormwater runoff in an average year. Given the similarities in the design, the proposed project would be expected to have a similar level of performance.

## 8.5 Legal Requirements and Obligations

**Describe any legal requirements or obligations that may arise as a result of constructing the Project and how these requirements will be satisfied:**

As discussed under "Environmental Documents and Permits",  a Mitigated Negative Declaration level CEQA documentation is expected for the Project. In addition, the Project is also required to obtain permit from LACFCD prior to construction. No additional legal requirements and obligations are anticipated for the Project. Projects of similar scope have been installed at project proximity with no dispute.

## 8.6 Technical Reports

**Please upload additional technical reports related to this project not provided above.**

## 8.7 Other

**Provide any additional information related to the Project as necessary:**

A sample of LA Metro's local drought-tolerant plant palette is provided to illustrate trees and shrubs that will be planted along the MOL bike and pedestrian paths following Project completion

| Attachments for this Section | |
|---|---|
| Attachment Name | Description |
| Plant Palette Drought Tolerant.pdf | Local drought-tolerant plants that will be planted along the MOL bike path upon project completion |

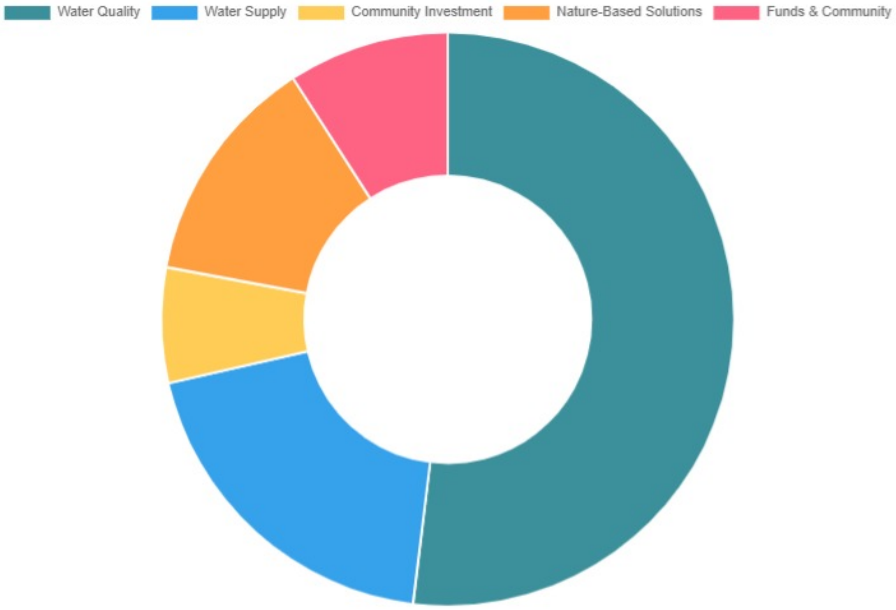
# 9 SCORING

This section summarizes scoring calculations generated by the Module. All Regional Program Projects must meet the Threshold Score of 60 points or more using the following Project Scoring Criteria to be eligible for consideration.

*Note: all scoring estimates are considered preliminary and subject to review and revision by the Scoring Committee.*

| Preliminary Estimated Project Score: |
|---|
| **77 points** |

The following graphics summarize the project scoring. The first graphic shows the components of the project score, based on the different scoring sections. The second graphic shows the percent of maximum score achieved by the project within each scoring section.


Water Quality
Water Supply
Community Investment
Nature-Based Solutions
Funds & Community


% of maximum score achieved
Water Quality
100
90
80
70
60
50
40
30
20
10
Water Supply
Community Investment
Nature-Based Solutions
Funds & Community

The following table details the scoring calculated for the project, along with the scoring thresholds from the SCW Project Scoring Criteria:

| Scoring Section | Project Score | Max Score | Scoring Criteria Thresholds |
|---|---|---|---|
| **Water Quality Wet + Dry Weather**<br>**Part 1** | 20 | 20 | Cost Effectiveness = (24-hour BMP Capacity) / (Construction Cost in $Millions)<br>• <0.4 = 0 points<br>• 0.4-0.6 = 7 points<br>• 0.6-0.8) = 11 points<br>• 0.8-1.0 = 14 points<br>• >1.0 = 20 points |
| **Water Quality Wet + Dry Weather**<br>**Part 2** | 20 | 30 | Primary Pollutant Reduction:<br>• >50% = 15 points<br>• >80% = 20 points<br>Secondary Pollutant Reduction:<br>• >50% = 5 points<br>• >80% = 10 points |
| **Water Quality Dry Weather Only**<br>**Part 1** | N/A | 20 | For dry weather BMPs only, Projects must be designed to capture, infiltrate, or divert 100% (unless infeasible or prohibited for habitat, etc.) of all tributary dry weather flows. |
| **Water Quality Dry Weather Only**<br>**Part 2** | N/A | 20 | For Dry Weather BMPs Only. Tributary Size of the Dry Weather BMP:<br>• <200 Acres = 10 points<br>• >200 Acres = 20 points |
| **Water Supply Part 1** | 3 | 13 | • >$2500/ac-ft = 0 points<br>• $2,000–2,500/ac-ft = 3 points<br>• $1500-2,000/ac-ft = 6 points<br>• $1000–1500/ac-ft = 10 points<br>• <$1000/ac-ft = 13 points |
| **Water Supply Part 2** | 12 | 12 | • <25 ac-ft/year = 0 points<br>• 25 - 100 ac-ft/year = 2 points<br>• 100 - 200 ac-ft/year = 5 points<br>• 200 - 300 ac-ft/year = 9 points<br>• >300 ac-ft/year = 12 points |
| **Community Investment** | 5 | 10 | • One Benefit = 2 points<br>• Three Benefits = 5 points<br>• Six Benefits = 10 points |
| **Nature Based Solutions** | 10 | 15 | • Implements natural processes or mimics natural processes to slow, detain, capture, and absorb/infiltrate water in a manner that protects, enhances and/or restores habitat, green space and/or usable open space = 5 points<br>• Utilizes natural materials such as soils and vegetation with a preference for native vegetation = 5 points<br>• Removes Impermeable Area from Project (1 point per 20% paved area removed) = 5 points |

| | | | |
|---|---|---|---|
| **Leveraging Funds Part 1** | 3 | 6 | • >25% Funding Matched = 3 points<br>• >50% Funding Matched = 6 points |
| **Leveraging Funds Part 2** | 4 | 4 | The Project demonstrates strong local, community-based support and/or has been developed as part of a partnership with local NGOs/CBOs. |
| **Total** | **77** | 110 / 100 | |

# 10 ATTACHMENTS

Attachments are bundled and organized in the following pages, with cover pages between each subsection.

**Please note –** at a minimum, a feasibility study must attach the following:

- A Location Map
- A Schematic with Proposed Footprint and Key Components
- A Map of the Capture Area (Tributary Map)
- Technical Reports (e.g. soil report, hydrology report, hydraulic study, utility search, survey, PEIR, EIR, monitoring data, etc.)

# ATTACHMENTS FOR SECTION 1.3:

## PROJECT SUMMARY

# Metro Orange Line Water Infiltration and Quality Project – Project Summary

Metro

Geosyntec consultants

engineers | scientists | innovators

## Project Overview

The project proposes to implement 168 drywells with pretreatment facilities along the Metro Orange Line (MOL) right-of-way in San Fernando Valley to capture, treat, and infiltrate stormwater runoff from 2,319 acres drainage area. It takes advantage of highly fortuitous siting as it intersects primary drainages in the region. Utilizing existing LACFCD infrastructure, the project intercepts, treats and infiltrates stormwater prior to discharge to the LA River. Furthermore, the infiltration occurs in the highest-value groundwater recharge areas within the City of Los Angeles. Use of existing LA Metro property avoids potential complications associated with land acquisition, and project siting can be conducted adding a largely subsurface beneficial use, without disrupting primary transportation functions. The Project catchment areas do not overlap with those from other existing or proposed infiltration projects.

The Project will be integrated into the MOL Bus Rail Transit (BRT) Improvements Project, which is a capital improvement project that will provide community benefits such as creating fast and reliable ridership, and enhancing pedestrian safety in disadvantaged communities and neighborhoods with significant unmet needs. Integrating the project with MOL BRT Improvement Project will also save construction cost and expedite project implementation process.

## Project Highlights

- The Project can provide an annual groundwater recharge yield between **780 and 1,050 acre-feet/year** into the San Fernando Groundwater Basin.
- The Project will remove 65% of the zinc and bacteria pollutant load on an annual average basis
- The Project will make **LA Metro net water positive**, allowing Metro to contribute more to regional groundwater infiltration than it uses to support all of its operations.
- The estimated capital cost of the project is $32 million (planning, design, construction). The estimated annual operation and maintenance cost is approximately $0.8 million per year. Los Angeles Department of Water and Power (LADWP) has agreed to fund 39% of the Project capital cost.
- LA Metro has engaged several key stakeholders in the development of the Project. This included targeted discussions with agencies such as LADWP, LA Sanitation, and StreetsLA and community organizations, such as Climate Resolve, Council for Watershed Health, and the NRDC. To date the Project has received three letters of support from the stakeholders.

## Project Location

🟥 Project Location

— Los Angeles River

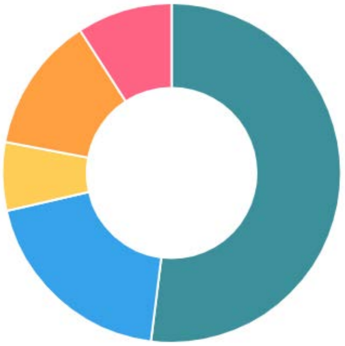
🟦 Los Angeles River Watershed

⬛ City of Los Angeles

## SCW Score Summary

Estimated Score:

77 points



🟦 Water Quality

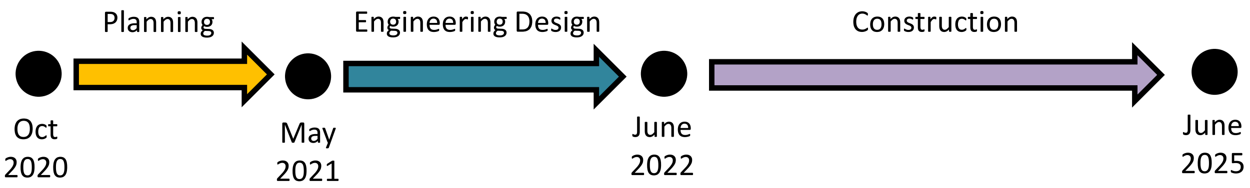
🟧 Nature-Based Solutions

🟦 Water Supply

🟥 Funds & Community

🟨 Community Investment

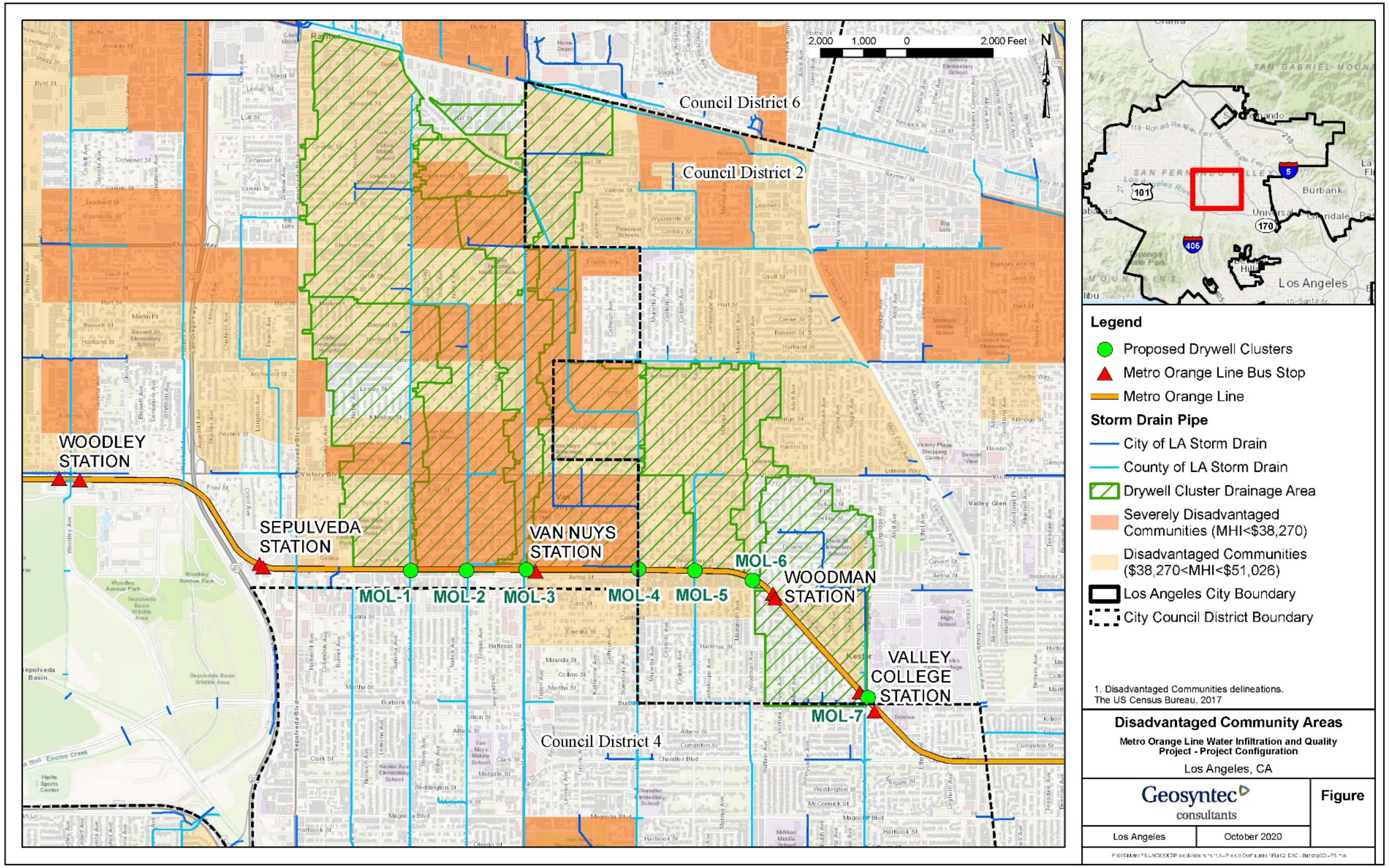
## Project Schedule



# Metro Orange Line Water Infiltration and Quality Project – SCW Score Details

| Scoring Section | Project Score | Max Possible Points | Project Score Description |
|---|---|---|---|
| **Water Quality Wet + Dry Weather Part 1** | 20 | 20 | Cost Effectiveness<br>>1.0 acre-feet capacity / $ million |
| **Water Quality Wet + Dry Weather Part 2** | 20 | 30 | Long-Term Pollutant Load Reduction<br>Primary Class of Pollutants: >50%<br>Second Class of Pollutants: >50% |
| **Water Supply Part 1** | 3 | 13 | Cost Effectiveness<br>$2,000–2,500/ac-ft |
| **Water Supply Part 2** | 12 | 12 | Annual Average Wet Weather Capture for Water Supply<br>>300 ac-ft/year |
| **Community Investment** | 5 | 10 | Three distinct Community Investment Benefits |
| **Nature-Based Solutions** | 10 | 15 | Implements natural processes or mimics natural processes to slow, detain, capture, and absorb/infiltrate water in a manner that protects, enhances and/or restores habitat, green space and/or usable open space<br>Utilizes natural materials such as soils and vegetation with a preference for native vegetation |
| **Leveraging Funds Part 1** | 3 | 6 | >25% Funding Matched |
| **Leveraging Funds Part 2** | 4 | 4 | The Project demonstrates strong local, community-based support and/or has been developed as part of a partnership with local NGOs/CBOs. |
| **Totals** | **77** | **110** | |

# Metro Orange Line Water Infiltration and Quality Project – Drainage Area Overview



1. Disadvantaged Communities delineations. The US Census Bureau, 2017

**Disadvantaged Community Areas**

**Metro Orange Line Water Infiltration and Quality Project - Project Configuration**

Los Angeles, CA

Geosyntec consultants

Los Angeles | October 2020 | Figure

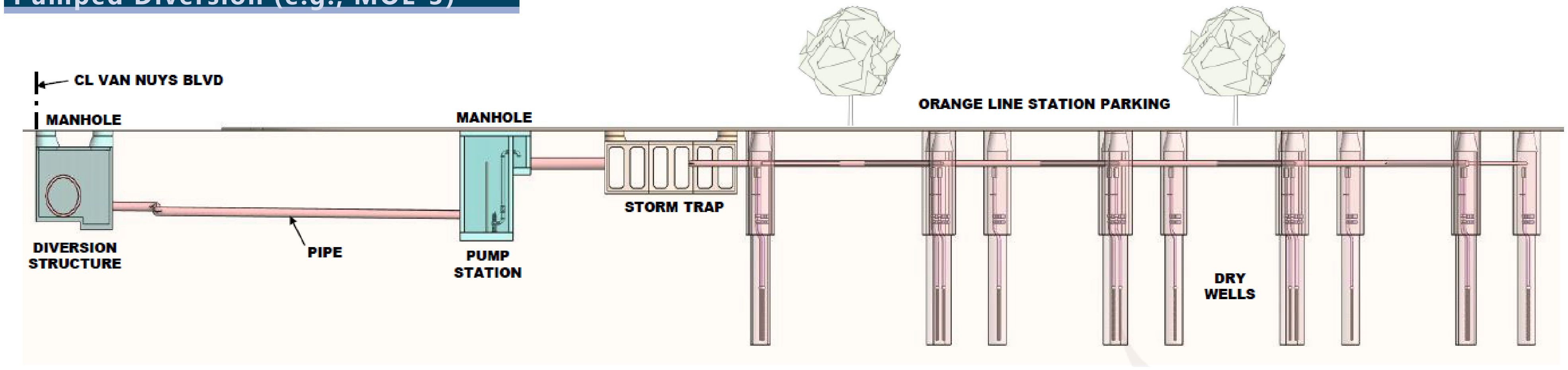
| Drywell Cluster ID | Drainage Area (ac) | Number of Drywells Proposed | Annual Groundwater Recharge Range (acre-feet) |
|---|---|---|---|
| MOL-1 | 308 | 24 | 100 - 140 |
| MOL-2 | 683 | 40 | 210 - 290 |
| MOL-3 | 197 | 14 | 80 - 110 |
| MOL-4 | 579 | 39 | 200 - 280 |
| MOL-5 | 193 | 13 | 50 - 70 |
| MOL-6 | 67 | 10 | 40 - 40 |
| MOL-7 | 292 | 28 | 100 - 120 |
| **Total** | **2,319** | **168** | **780 – 1,050** |

# Metro Orange Line Water Infiltration and Quality Project – Example Design Schematic

Metro

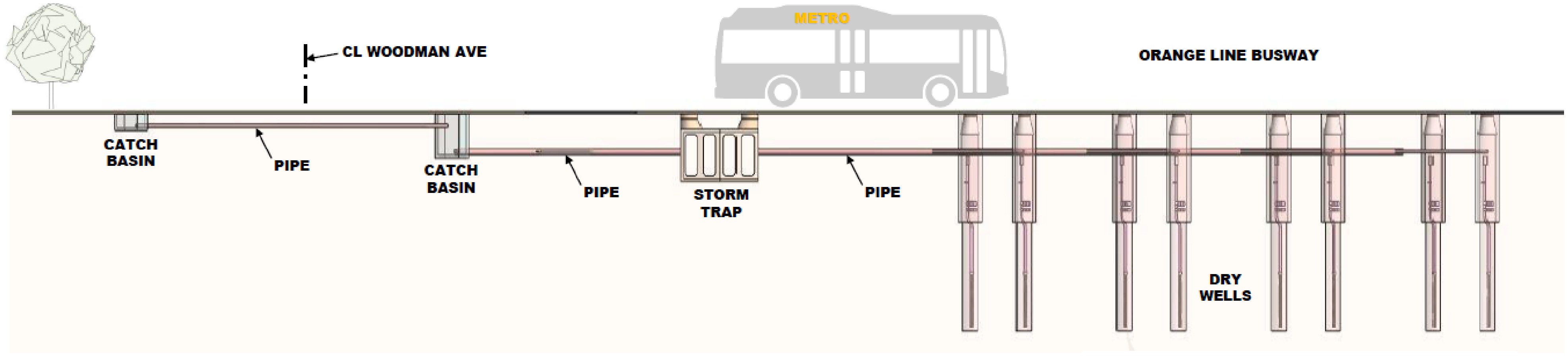
Geosyntec consultants
engineers | scientists | innovators

## Pumped Diversion (e.g., MOL-3)

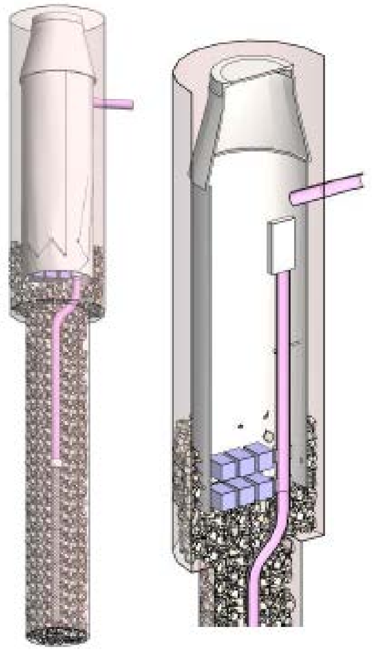


**ELEVATION**
(LOOKING NORTH)
NOT TO SCALE

## Gravity Diversion (e.g., MOL-6)



**ELEVATION**
(LOOKING NORTH-EAST)
NOT TO SCALE



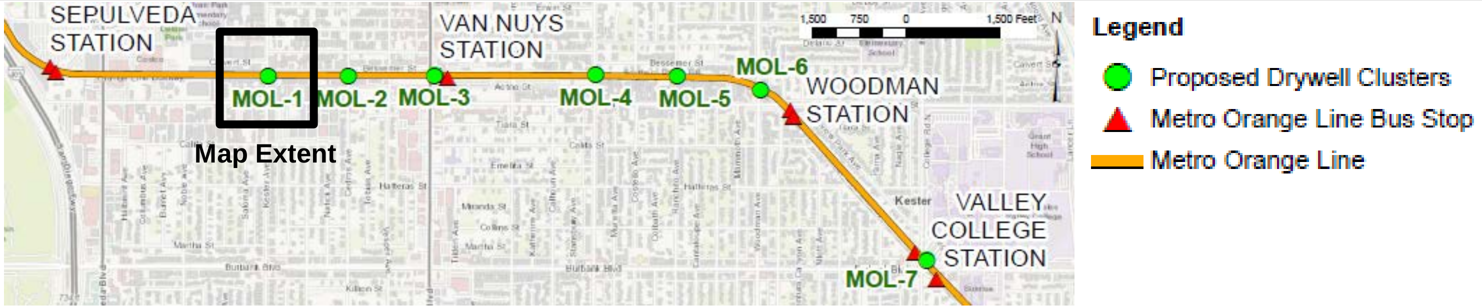
**DRY WELL DETAILS**

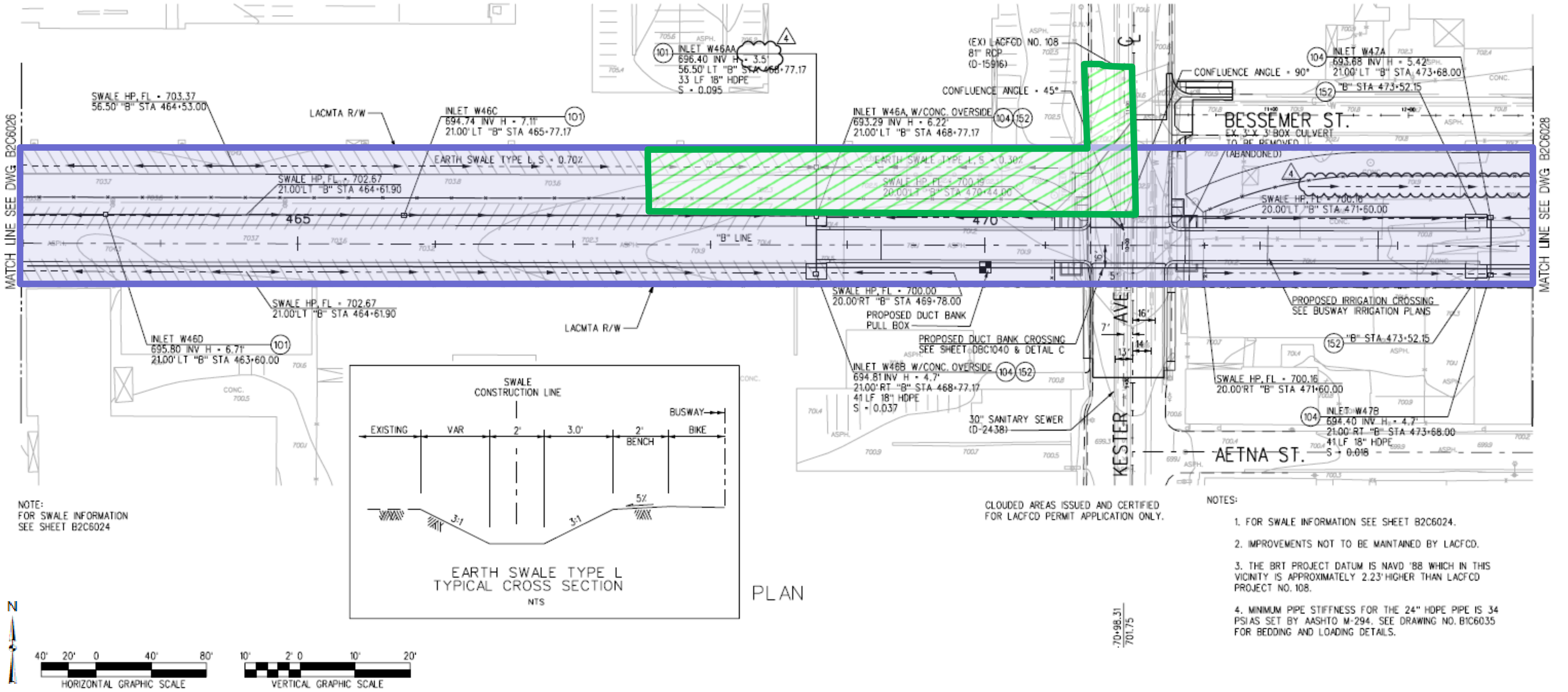
# ATTACHMENTS FOR SECTION 1.1:

## OVERVIEW

# ATTACHMENTS FOR SECTION 1.2:

## PROJECT LOCATION





## Legend

▭ LA Metro Right-of-Way

▨ Approximate Subsurface BMP Site Location

A minor subsurface component of the proposed Project (diversion structure and piping) is located underneath City of Los Angeles Right-of-Way. Proper easement will be obtained from the City at later Project planning stage.

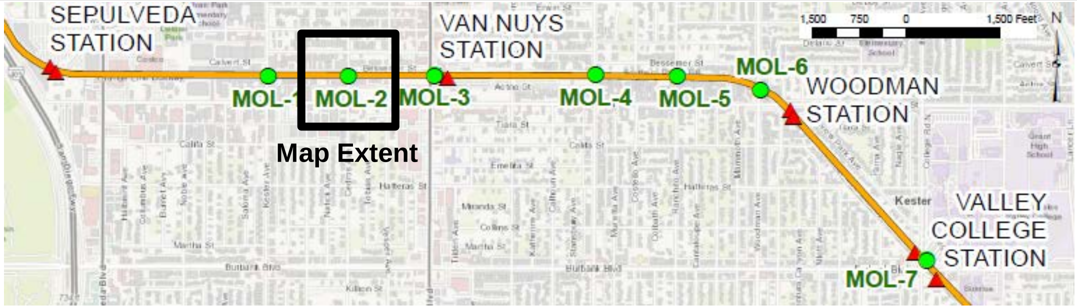
**Project Land Ownership and Rights-of-Way at MOL-1**

**Metro Orange Line Water Quality and Infiltration Project**
Los Angeles, CA

Geosyntec consultants

**Figure**
**1a**

Los Angeles
October 2020

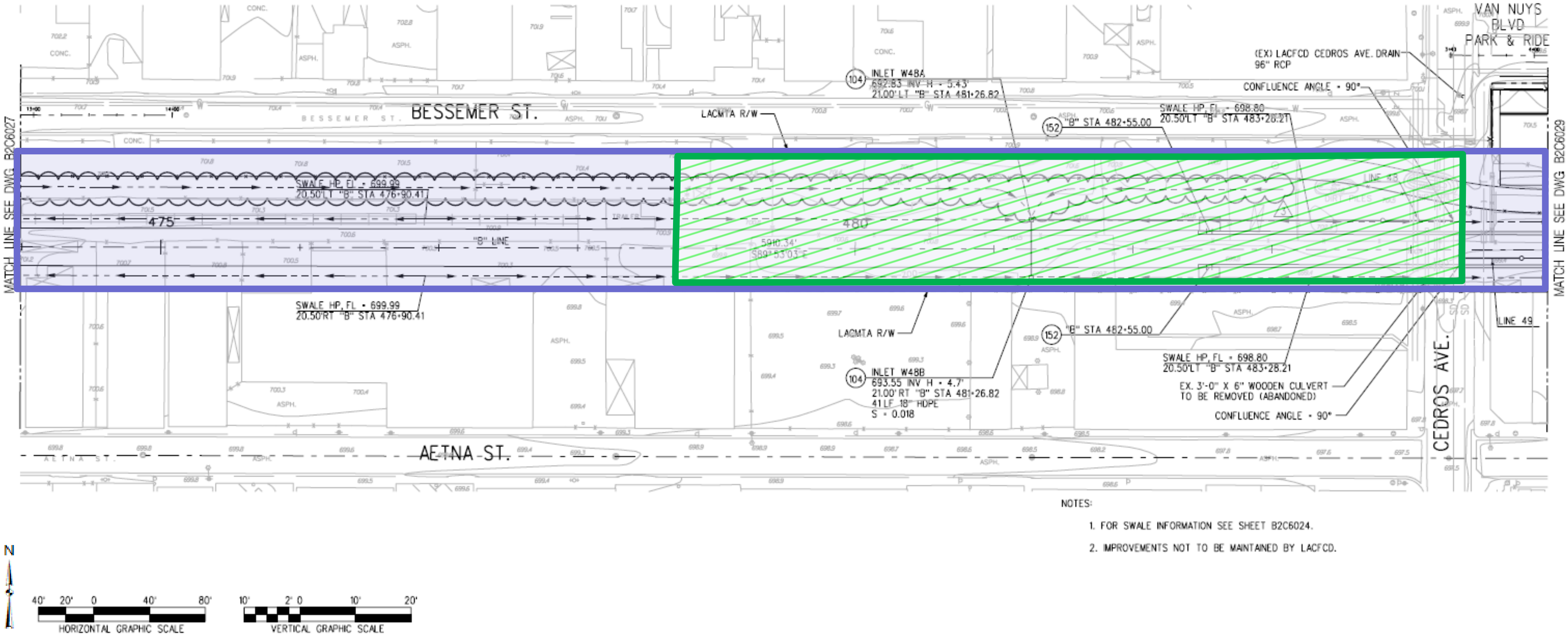


**Legend**

● Proposed Drywell Clusters

▲ Metro Orange Line Bus Stop

🟧 Metro Orange Line



NOTES:

1. FOR SWALE INFORMATION SEE SHEET B2C6024.
2. IMPROVEMENTS NOT TO BE MAINTAINED BY LACFCD.

**Legend**

🟪 LA Metro Right-of-Way

▨ Approximate Subsurface BMP Site Location

**Project Land Ownership and Rights-of-Way at MOL-2**

**Metro Orange Line Water Quality and Infiltration Project**

Los Angeles, CA

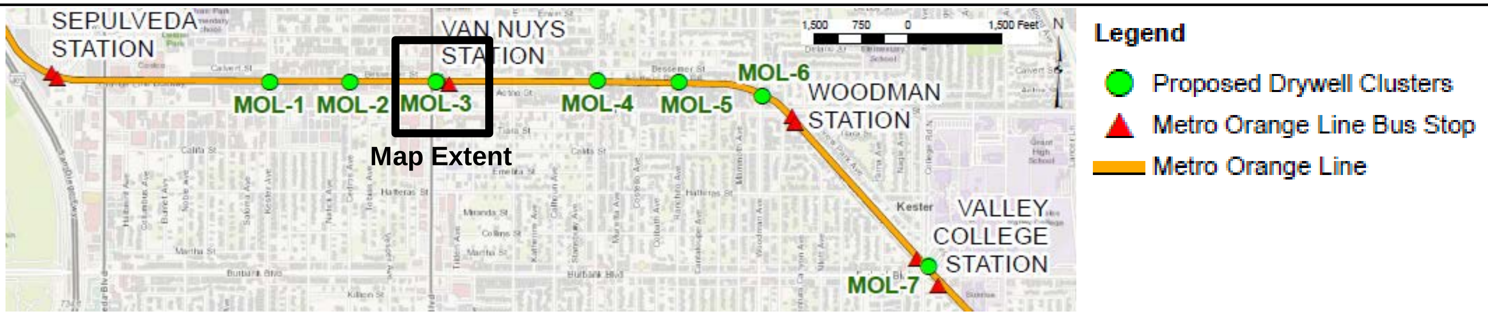
Geosyntec consultants

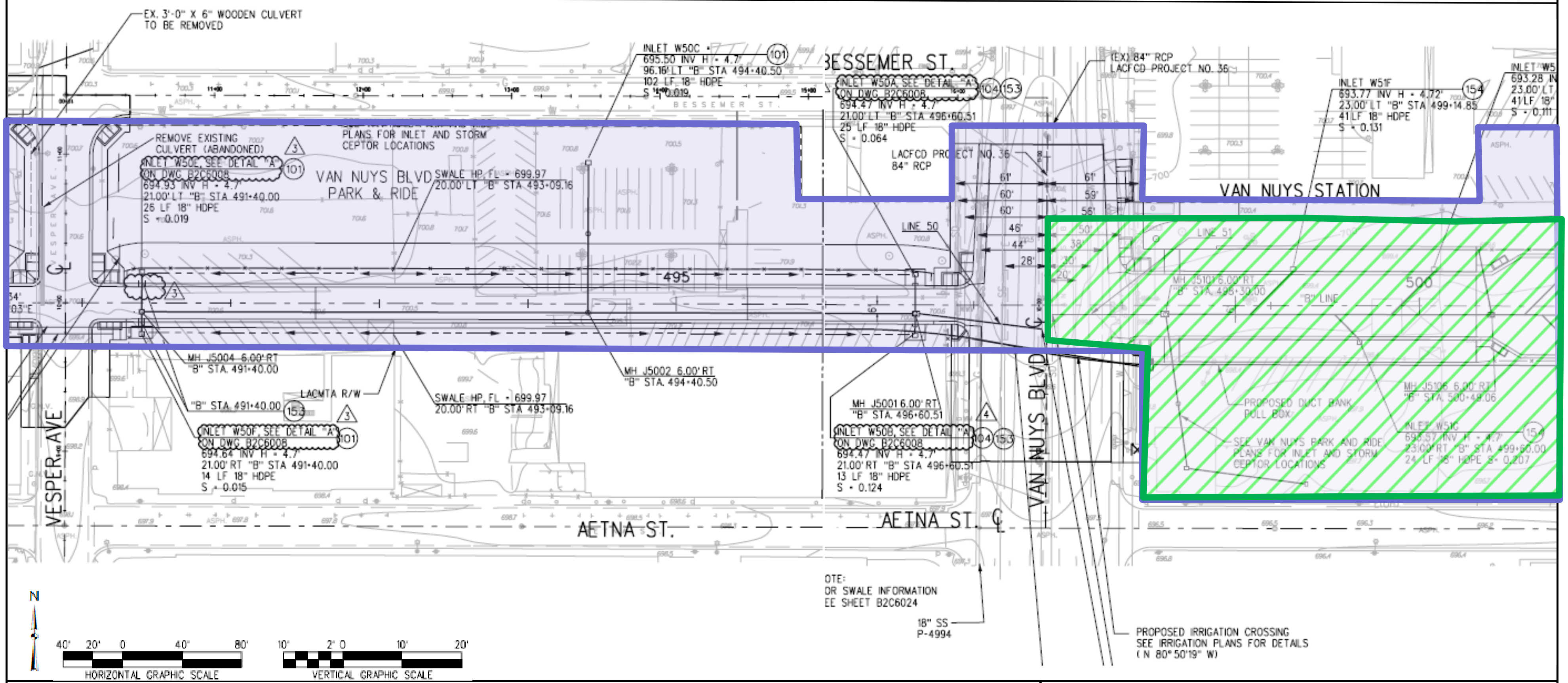
**Figure**

**1b**

Los Angeles

October 2020





**Legend**

▭ LA Metro Right-of-Way

▨ Approximate Subsurface BMP Site Location

**Project Land Ownership and Rights-of-Way at MOL-3**

**Metro Orange Line Water Quality and Infiltration Project**

Los Angeles, CA

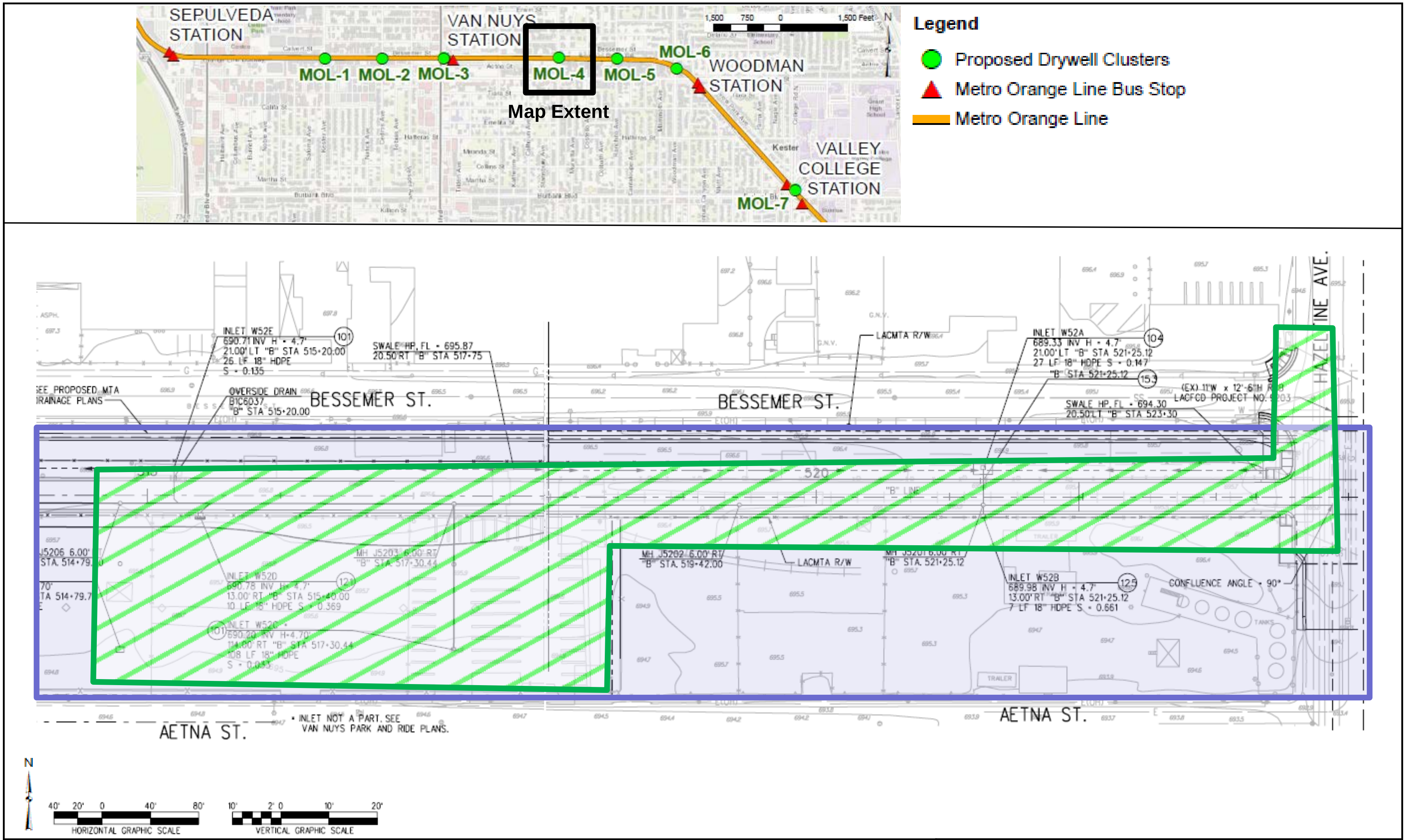
Geosyntec consultants

Los Angeles

October 2020

**Figure**

**1c**



**Legend**

▭ LA Metro Right-of-Way

▨ Approximate Subsurface BMP Site Location

A minor subsurface component of the proposed Project (diversion structure and piping) is located underneath City of Los Angeles Right-of-Way. Proper easement will be obtained from the City at later Project planning stage.

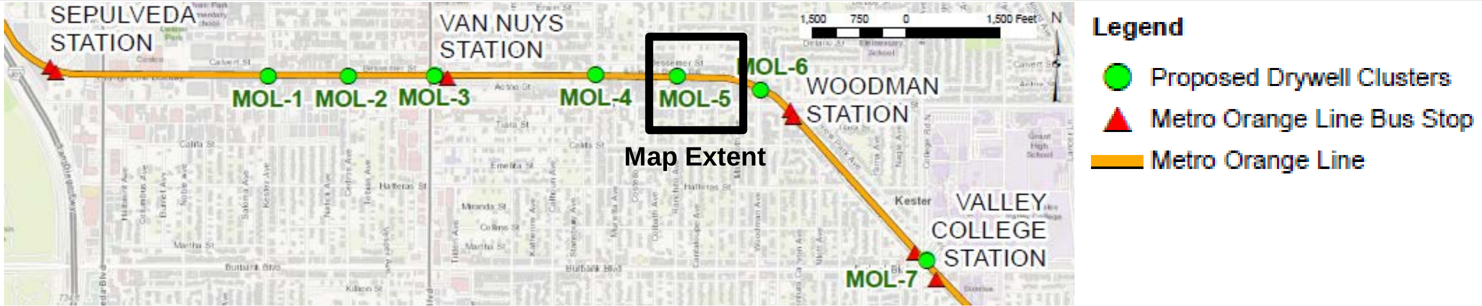
**Project Land Ownership and Rights-of-Way at MOL-4**

**Metro Orange Line Water Quality and Infiltration Project**
Los Angeles, CA

Geosyntec consultants

Los Angeles | October 2020

**Figure 1d**



## Legend

▭ LA Metro Right-of-Way

▨ Approximate Subsurface BMP Site Location

A minor subsurface component of the proposed Project (diversion structure and piping) is located underneath City of Los Angeles Right-of-Way. Proper easement will be obtained from the City at later Project planning stage.

**Project Land Ownership and Rights-of-Way at MOL-5**

**Metro Orange Line Water Quality and Infiltration Project**

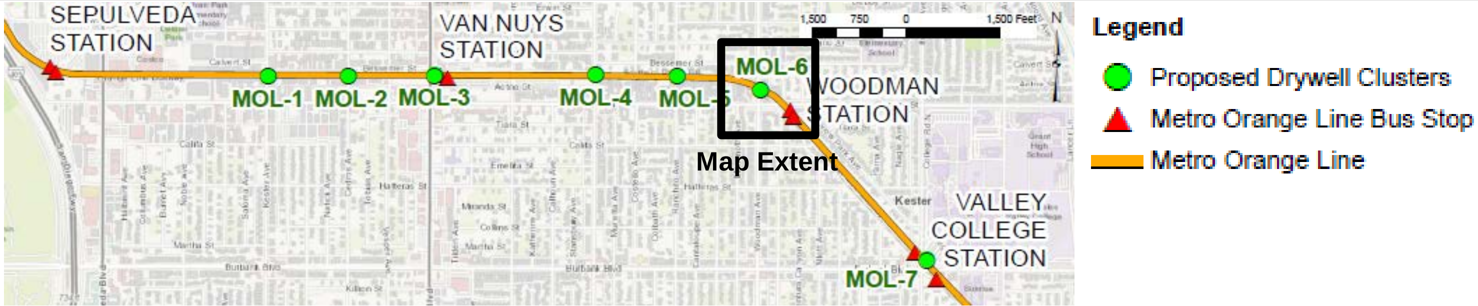
Los Angeles, CA

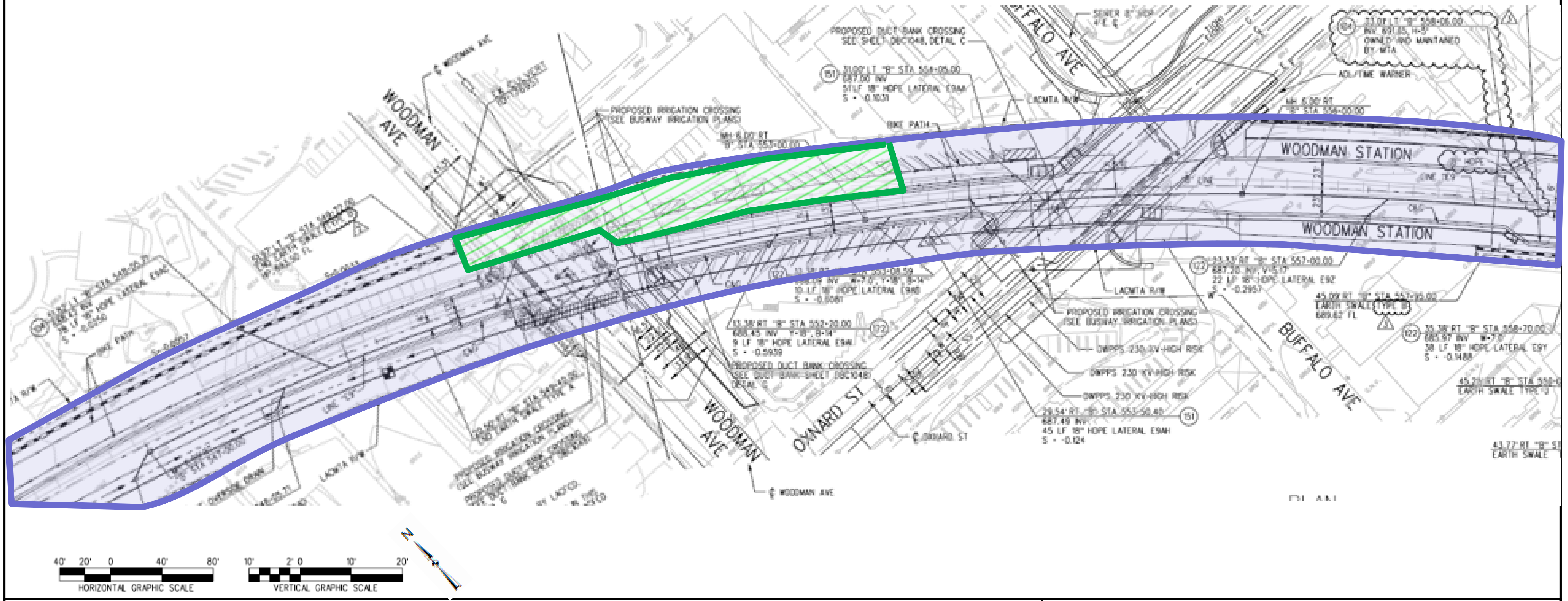
Geosyntec consultants

Los Angeles | October 2020

**Figure**

**1e**





## Legend

▭ LA Metro Right-of-Way

▨ Approximate Subsurface BMP Site Location

**Project Land Ownership and Rights-of-Way at MOL-6**

**Metro Orange Line Water Quality and Infiltration Project**
Los Angeles, CA

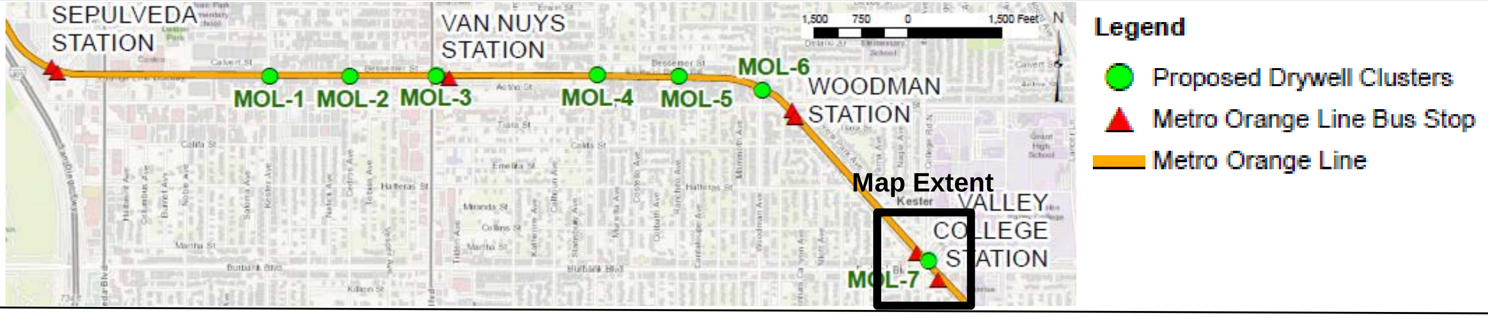
Geosyntec
consultants

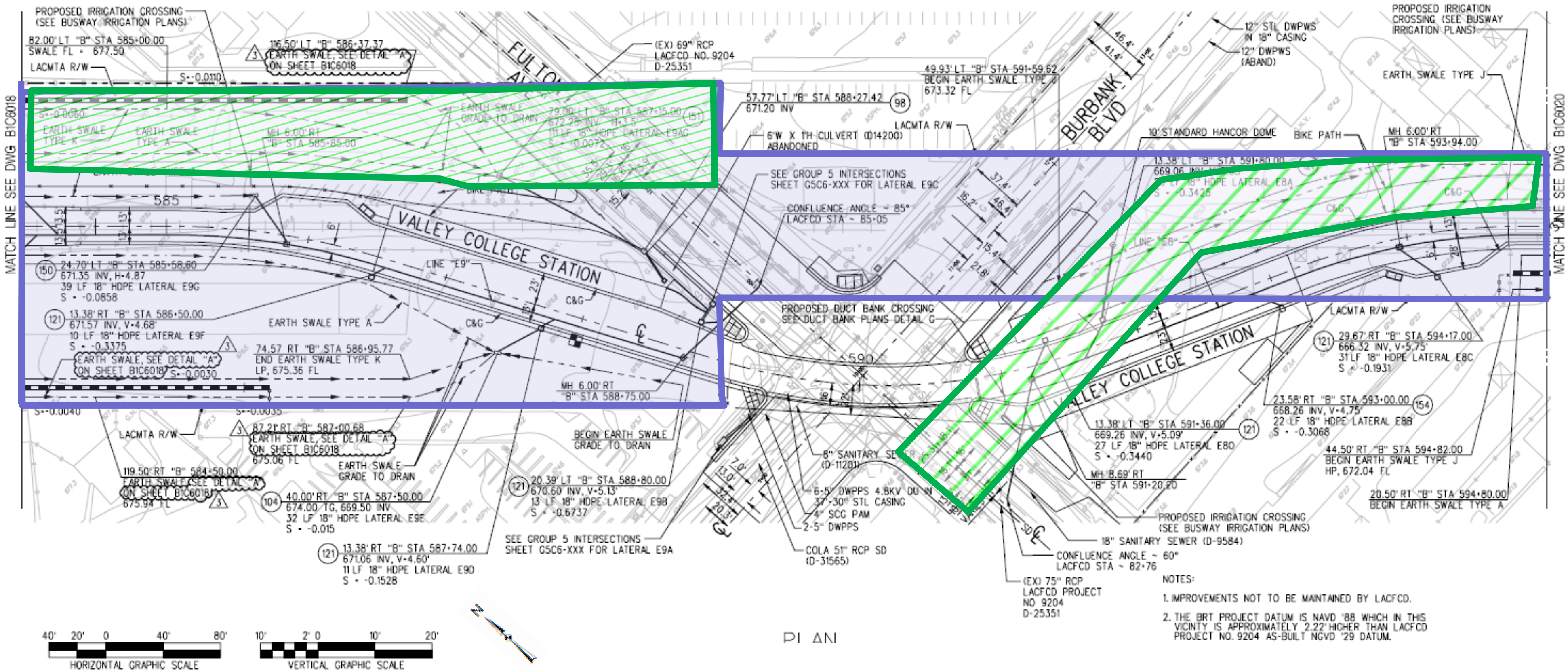
**Figure**

**1f**

Los Angeles

October 2020





NOTES:

1. IMPROVEMENTS NOT TO BE MAINTAINED BY LACFCD.
2. THE BRT PROJECT DATUM IS NAVD '88 WHICH IN THIS VICINITY IS APPROXIMATELY 2.22' HIGHER THAN LACFCD PROJECT NO. 9204 AS-BUILT NGVD '29 DATUM.

## Legend

▭ LA Metro Rights-of-Way

▨ Approximate Subsurface BMP Site Location

A minor subsurface component of the proposed Project (diversion structure and piping) is located underneath City of Los Angeles Right-of-Way. Proper easement will be obtained from the City at later Project planning stage.

**Project Land Ownership and Rights-of-Way at MOL-7**

**Metro Orange Line Water Quality and Infiltration Project**

Los Angeles, CA

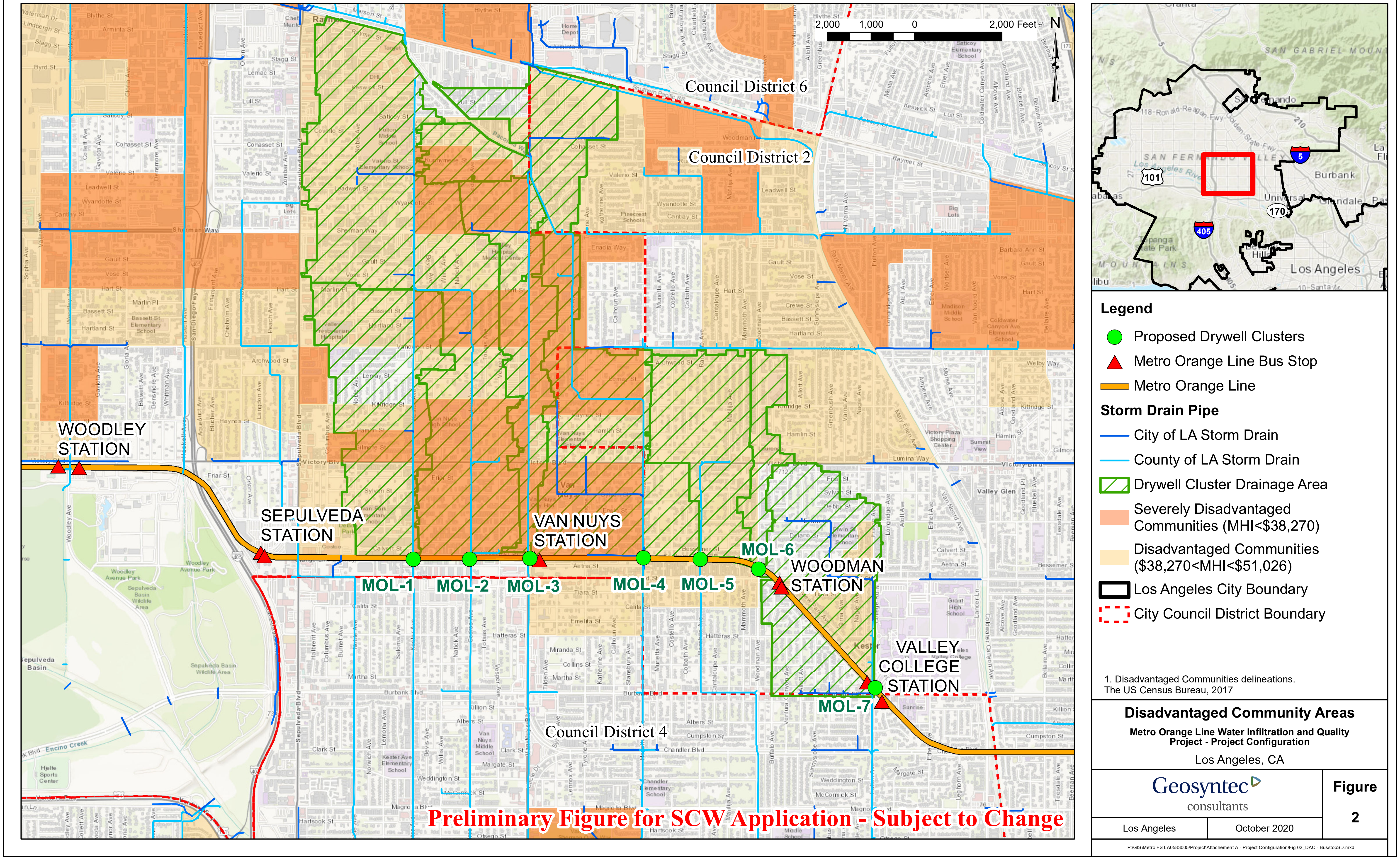
Geosyntec consultants

Los Angeles

October 2020

**Figure**

**1g**



**Preliminary Figure for SCW Application - Subject to Change**

1. Disadvantaged Communities delineations.
The US Census Bureau, 2017

## Disadvantaged Community Areas

**Metro Orange Line Water Infiltration and Quality Project - Project Configuration**

Los Angeles, CA

Geosyntec consultants

Figure 2

Los Angeles | October 2020

P:\GIS\Metro FS LA0583005\Project\Attachement A - Project Configuration\Fig 02_DAC - BusstopSD.mxd

# ATTACHMENTS FOR SECTION 2.1:

## CONFIGURATION

Geosyntec consultants

engineers | scientists | innovators

Metro

# Project Configuration

## Metro Orange Line Water Infiltration and Quality Project

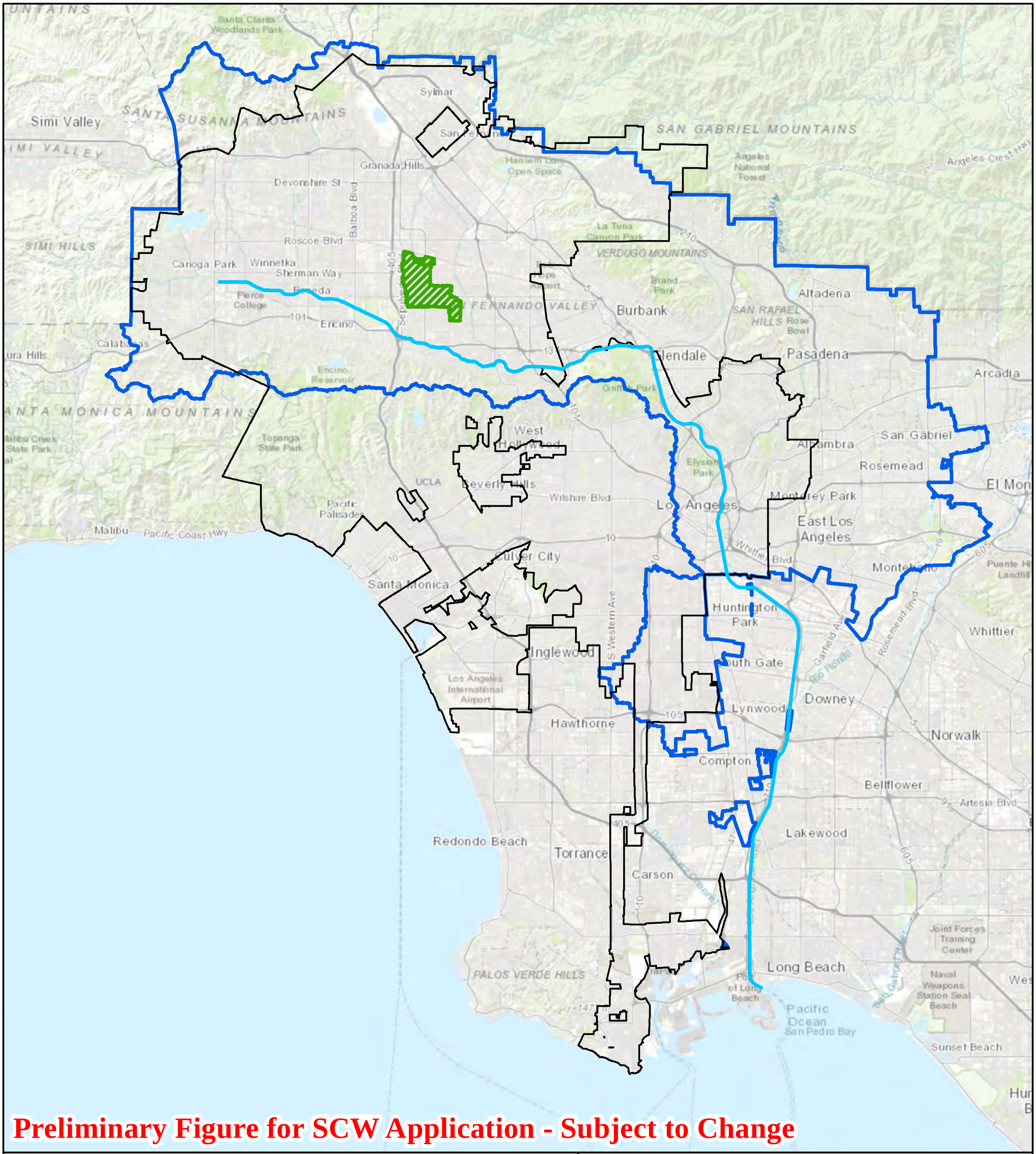
The Metro Orange Line Water Infiltration and Quality Project (Project) proposes to design and implement infiltration best management practices (BMPs) within LA Metro parcels and right-of-way (ROW) in the San Fernando Valley area within the City of Los Angeles.

As shown in Figure 1, the Project is located within the Upper Los Angeles River (ULAR) Watershed, in the San Fernando Valley area of the City of Los Angeles. The Project aims to achieve the following objectives:

- Primary Objective: Achieve water supply benefits through capture and infiltration;
- Secondary Objectives: Improve surface water quality downstream of the Project area, and reduce the risk of potential localized flooding by alleviating peak flow rate.

To meet these objectives, 168 drywells are proposed, as well as underground pretreatment facilities, separated into seven geographic clusters. All drywells are proposed to be installed fully subsurface without surface-level pretreatment, minimizing any potential disruption to the Metro Orange Line operation. Since the Project relies on diverting stormwater runoff from the Los Angeles County Flood Control District (LACFCD) storm drains, an LACFCD connection permit will be obtained. No other Project components are proposed within other public owned property or right-of-way. Preliminary BMP configuration and typical design details are included in Appendix A.

# FIGURES



Preliminary Figure for SCW Application - Subject to Change

**Legend**

▨ Metro Stormwater Drainage Area

— Los Angeles River

☐ Upper LA River Watershed (ULAR)

☐ Los Angeles City Boundary

# Project Location and ULAR Watershed

**Metro Orange Line Water Infiltration and Quality Project - Project Configuration**

Los Angeles, CA

Geosyntec consultants

Los Angeles | October 2020

**Figure**

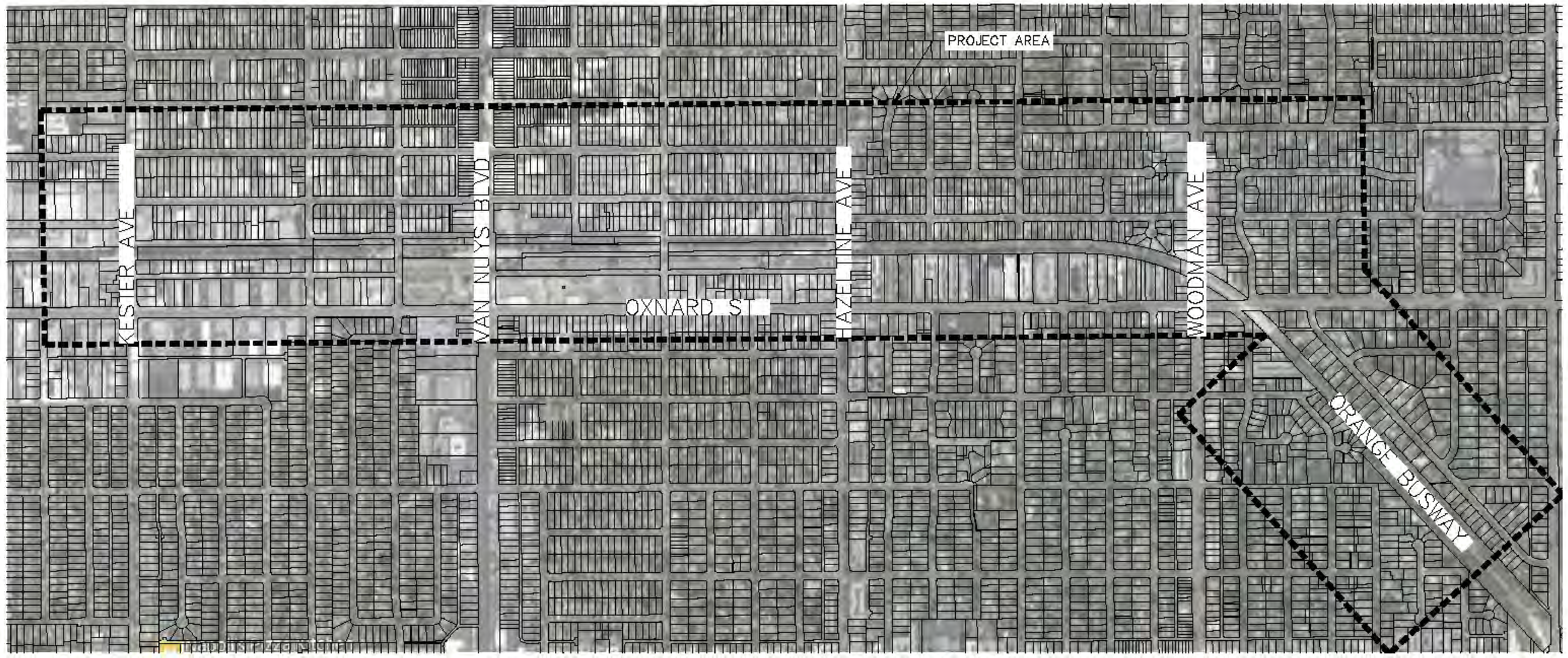
**1**

# Appendix A

## Preliminary Drawing

# LOS ANGELES COUNTY
# METROPOLITAN TRANSPORTATION AUTHORITY

## Metro Orange Line Stormwater
## Capture and Recharge



( THOMAS GUIDE PAGE 532, GRID G-5 )

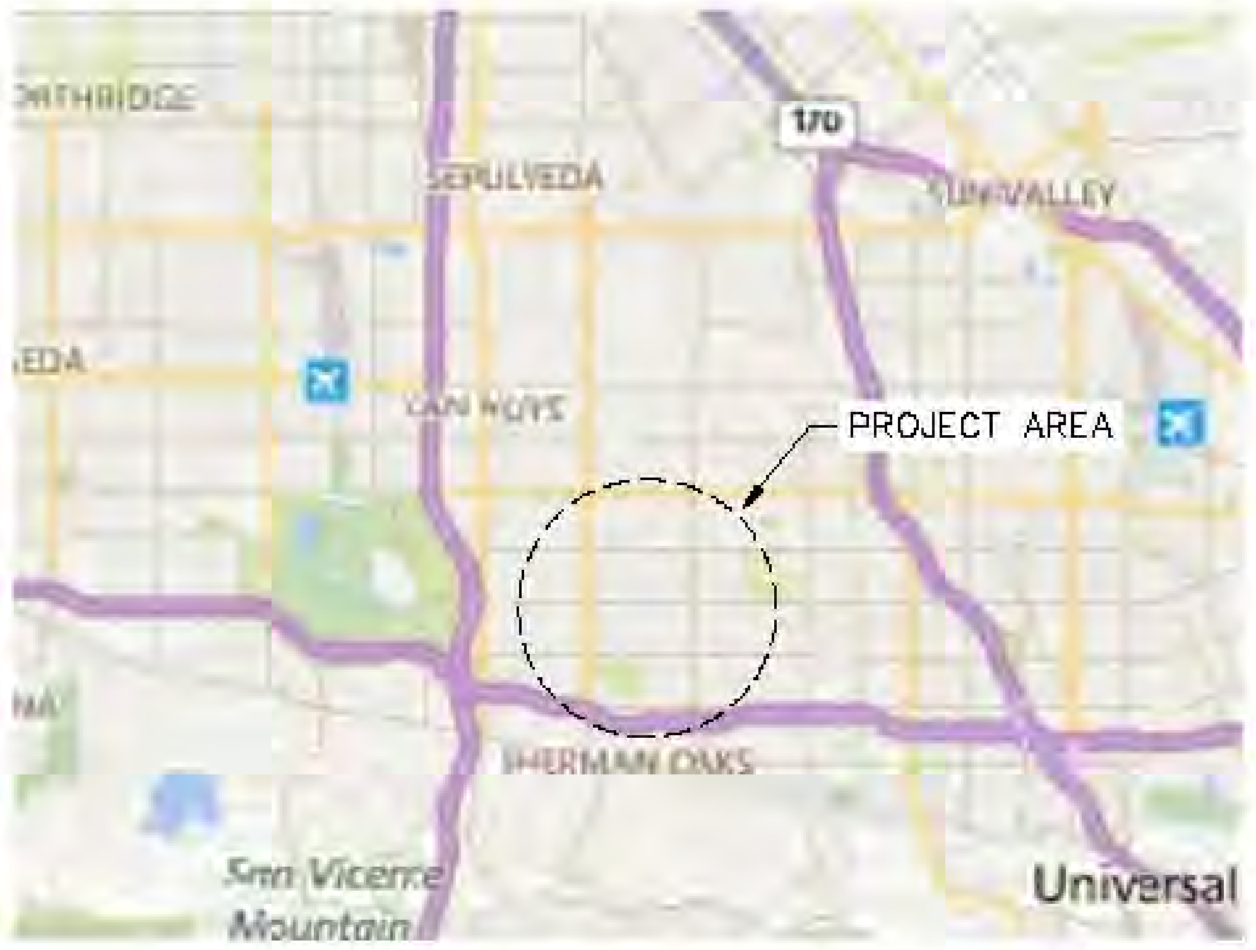
VICINITY MAP

NOT TO SCALE

FOR SAFE CLEAN WATER
PROGRAM APPLICATION
NOT FOR CONSTRUCTION

### SHEET INDEX

| SHEET NO. | SHEET TITLE | SHEET NO. | SHEET TITLE |
|---|---|---|---|
| 1 | TITLE SHEET | 13 | PRETREATMENT DETAIL & SECTION |
| 2 | NOTES, ABBREVIATIONS & SYMBOLS | 14 | PRETREATMENT DETAILS |
| 3 | MOL 1 | 15 | DIVISION STRUCTURE DETAILS |
| 4 | MOL 2 | 16 | PUMP STATION DETAILS |
| 5 | MOL 3 | 17 | DRYWELL & TRENCH DETAILS |
| 6 | MOL 4 SHEET 1 OF 2 | 18 | CATCH BASIN DETAILS |
| 7 | MOL 4 SHEET 2 OF 2 | | |
| 8 | MOL 5 | | |
| 9 | MOL 6 | | |
| 10 | MOL 7 SHEET 1 OF 2 | | |
| 11 | MOL 7 SHEET 2 OF 2 | | |
| 12 | PRETREATMENT DETAIL & PLAN | | |



LOCATION MAP

NOT TO SCALE

DRP

Geosyntec consultants
engineers | scientists | innovators

448 S. HILL ST.
SUITE 1008
LOS ANGELES, CA 90013
TEL (310) 957-6100
www.geosyntec.com

LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY

Metro

V NO. | REVISIONS: | DATE: | BY:

WORK ACCEPTED

SERIAL NO.

STRUCTURE NO.

INDEX NO.

ENRIQUE C. ZALDIVAR, P.E. DIRECTOR & GENERAL MANAGER

ACCEPTED BY :

DIRECTOR AND GENERAL MANAGER ______ DATE

WATERSHED PROTECTION PROGRAM MANAGER ______ DATE

ASSISTANT DIVISION MANAGER ______ DATE

VERTICAL CONTROL: N/A
HORIZONTAL CONTROL: N/A

SHEET TITLE: TITLE SHEET

PROJECT: METRO ORANGE LINE IMPROVEMENT

ADDRESS: VAN NUYS, CA

WORK ORDER NO.
XXXXXXXX

DRAWING NO.

SHEET 1 OF 17 SHEETS

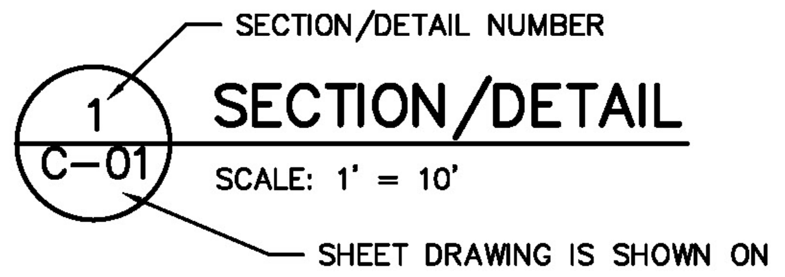
THE CITY OF LOS ANGELES OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

REVISION DATES (DESIGN STAGE ONLY)

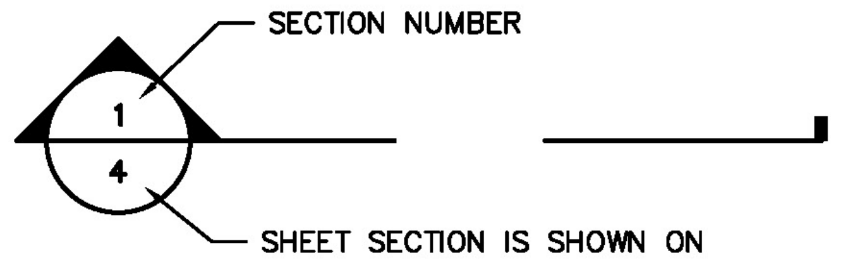
Sheet Version 3.0

## SYMBOLS:

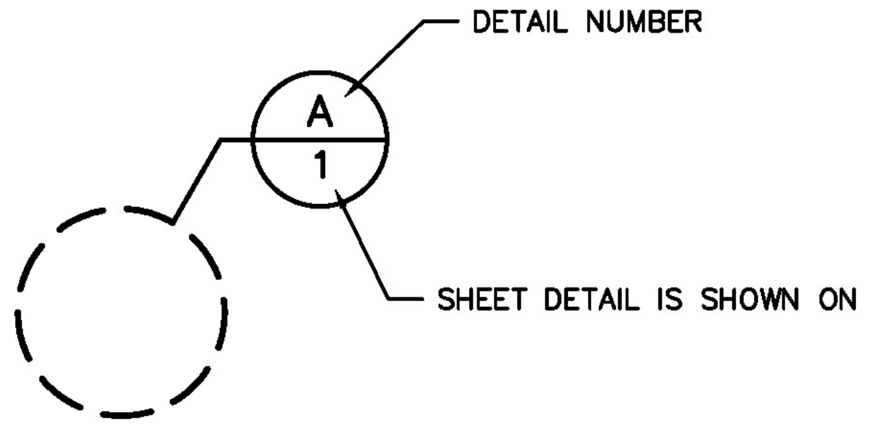
### TITLE MARKERS



### SECTION MARKERS



### DETAIL MARKERS



## LEGEND:

| | |
|---|---|
| ——— | PARCEL LINE |
| ——— - ——— | STREET CENTERLINE |
| ——— SD ——— | EX STORM DRAIN |
| ——— SS ——— | EX SANITARY SEWER |
| ——— G ——— | EX WATER LINE |
| ——— W ——— | EX WATER LINE |
| ——— FO ——— | EX FIBER OPTICS LINE |
| ——— OH ——— | EX OVERHEAD LINES |

## NOTICE TO CONTRACTORS:

1. THIS IMPROVEMENT CONSISTS OF WORK CALLED FOR ONLY ON THIS PLAN.
2. INSPECTION: ALL WORK AND MATERIALS SHALL BE INSPECTED BY THE INSPECTOR OF PUBLIC WORKS DURING CONSTRUCTION PURSUANT TO LATEST EDITION OF "STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION" (GREENBOOK) AS AMENDED BY THE CITY OF LOS ANGELES DEPARTMENT OF PUBLIC WORKS "BROWN BOOK", AND THE STANDARD PLANS FOR PUBLIC WORKS CONSTRUCTION AS APPLICABLE. CALL INSPECTION DISPATCH AT (213) 485-5080 BEFORE NOON OF THE WORKING DAY BEFORE THE FIRST SCHEDULED DAY OF CONSTRUCTION.

   PRIOR TO THE START OF ANY CONSTRUCTION, DEMOLITION, REMOVALS, SAWCUTING, OR INSTALLATION OF TRAFFIC CONTROL, THE CONTRACTOR SHALL MEET WITH THE INSPECTOR TO DISCUSS SAFETY, TRAFFIC CONTROL REQUIREMENTS, PUBLIC ACCESS, CONSTRUCTION IMPACT MITIGATION, REMOVAL LIMITS, AND CONTRACTOR'S PLANNED SEQUENCING OF OPERATIONS.

   PRIOR TO OR AT THE PROJECT PRECONSTRUCTION MEETING THE CONTRACTOR SHALL PROVIDE THE INSPECTOR TWO (2) SETS OF FULL-SIZE PLANS AND MAINTAIN ONE (1) SET OF FULL-SIZE PLANS AT THE SITE DURING CONSTRUCTION.
3. IN CONFORMANCE WITH LOS ANGELES CITY ORDINANCE NO. 150,478 POTHOLE EXISTING SUBSURFACE INSTALLATIONS CARRYING UNSTABLE SUBSTANCES TO DETERMINE THEIR LOCATIONS AND ELEVATIONS BEFORE COMMENCING EXCAVATION.
4. UNDERGROUND SERVICE ALERT: BEFORE COMMENCING ANY EXCAVATION, OBTAIN AN UNDERGROUND SERVICE ALERT (USA) INQUIRY I.D. NUMBER BY CALLING 811 OR (800) 422-4133. TWO WORKING DAYS SHALL BE ALLOWED AFTER THE I.D. NUMBER IS OBTAINED AND BEFORE THE CONTRACTOR STARTS THE EXCAVATION WORK SO THAT UTILITY OWNERS CAN BE NOTIFIED. IF THE UTILTIY OWNER IS THE CITY OF LOS ANGELES, A CONFIRMATION NUMBER INDICATING THE CITY HAS BEEN NOTITIED SHALL BE OBTAINED BY USA AND/OR THE CONTRACTOR FROM THE APPROPRIATE CITY DEPARTMENT. THE I.D. NUMBER TOGETHER WITH THE DATE ACQUIRED SHALL BE REPORTED TO THE BUREAU OF CONTRACT ADMINISTRATION WHEN CALLING FOR INSPECTION. I.D. NUMBERS WILL NOT BE GIVEN MORE THAN TEN (10) DAYS BEFORE STARTING EXCAVATION WORK.
5. AT LEAST THIRTY (30) DAYS BEFORE THE START OF CONSTRUCTION CONTACT THE BUREAU OF STREET SERVICES, COORDINATING SECTION AT (213) 847-3200 TO VERIFY THAT THERE IS NO PROPOSED PROJECT IN THIS AREA.
6. NOTIFICATION: AT LEAST TEN (10) DAYS BEFORE THE START OF CONSTRUCTION, NOTIFY, IN WRITING, ABUTTING PROPERTY OCCUPANTS OF THE PROPOSED CONSTRUCTION START DATE. A COPY OF SAID WRITTEN NOTIFICATION SHALL BE PROVIDED TO THE PUBLIC WORKS INSPECTOR FOR APPROVAL BEFORE THEY ARE DISTRIBUTED TO THE OCCUPANTS OF THE ABUTTING PROPERTY.
7. PROVIDE TRAFFIC CONTROL PER THE LATEST EDITION OF THE WORK AREA TRAFFIC CONTROL HANDBOOK (WATCH) MANUAL ADOPTED BY THE CITY OF LOS ANGELES BOARD OF PUBLIC WORKS.
8. PROTECTION OF EXISTING FACILITIES: UNLESS OTHERWISE SPECIFICALLY STATED IN THESE DRAWINGS, PROTECT ALL EXISTING IMPROVEMENTS INCLUDING UTILITIES. FACILITIES DISTURBED OR DAMAGED BY THE CONTRACTOR ARE TO BE RESTORED WITH MATERIALS EQUAL OR BETTER THAN THE ORIGINAL AT THE CONTRACTOR'S EXPENSE.

## GENERAL NOTES:

1. PRIOR TO START OF CONSTRUCTION, VERIFY ALL EXISTING CONDITIONS REQUIRED TO PERFORM WORK. IF CONDITIONS DIFFER FROM THOSE SHOWN ON THE DRAWINGS, NOTIFY THE ENGINEER IMMEDIATELY AND STOP WORK UNTIL DIFFERING CONDITIONS HAVE BEEN EVALUATED.
2. SHOULD CONFLICTING INFORMATION BE FOUND ON THE PLANS, NOTIFY THE ENGINEER BEFORE PROCEEDING WITH THE WORK IN QUESTION.
3. MINIMUM SAFETY STANDARDS: COMPLY WITH ALL APPLICABLE STATE OF CALIFORNIA, DEPARTMENT OF INDUSTRIAL RELATIONS, AND DIVISION OF OCCUPATIONAL SAFETY AND HEALTH (CAL/OSHA) SAFETY STANDARDS.
4. TEMPORARY FACILITIES: CONTRACTOR IS RESPONSIBLE FOR ALL TEMPORARY FACILITIES INCLUDING POWER, WATER, AND SANITARY FACILITIES NEEDED FOR CONSTRUCTION.

## EROSION & SEDIMENT CONTROL NOTES:

1. ALL CONSTRUCTION/DEMOLITION, GRADING, AND STORAGE OF BULK MATERIALS MUST COMPLY WITH THE SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT (SCAQMD) RULE 403 FOR FUGITIVE DUST.
2. ALL DEBRIS SHALL BE CLEANED UP DAILY AND SECURED AT THE END OF THE DAY.
3. PROTECT DOWNSTREAM CATCH BASIN AND SURFACE WATERS FROM CONVEYANCE OF CONSTRUCTION POLLUTANTS. MAINTAIN AND MODIFY AS NEEDED DURING CONSTRUCTION.

## SPECIFICATIONS:

1. GENERAL:
   - 1.1. ALL WORK SHALL CONFORM TO THE LATEST EDITION AND SUPPLEMENTS OF "STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION" (GREENBOOK), AND CORRESPONDING "ADDITIONS AND AMENDMENTS TO THE LATEST EDITION OF THE STANDARD SPECIFICATIONS FOR PUBLIC WORK CONSTRUCTION" (BROWN BOOK).
   - 1.2. INSTALL MATERIALS AND EQUIPMENT IN ACCORDANCE WITH MANUFACTURER GUIDELINES UNLESS OTHERWISE NOTED ON DRAWINGS AND SPECIFICATIONS.
   - 1.3. EQUAL PRODUCTS: CONTRACTOR CAN PROVIDE "EQUAL" PRODUCTS FOR ALL MATERIALS SPECIFIED. IF EQUAL PRODUCTS ARE PRUPOSED, IT IS THE CONTRACTOR'S RESPONSIBILITY TO DEMONSTRATE THAT THE PROPOSED PRODUCTS ARE EQUAL TO THE SPECIFIED PRODUCT. PRE-APPROVED MATERIALS ARE NOTED IN PARENTHESIS.
2. EARTHWORK:
   - 2.1. NO FILL TO BE PLACED UNTIL EXCAVATION BOTTOM HAS BEEN INSPECTED AND APPROVED BY THE ENGINEER.
   - 2.2. SUBGRADE PREPARATION: SCARIFY AND RE-COMPACT TOP 6 INCHES OF LOOSE OR DISTURBED SUBGRADE UNLESS OTHERWISE DIRECTED BY THE ENGINEER. FILL MAY BE PLACED DIRECTLY ON TOP OF THE UNDISTURBED NATIVE MATERIALS AS DETERMINED BY THE ENGINEER.
   - 2.3. FILL MATERIAL: SCREENED NATIVE MATERIALS ARE SUITABLE FOR USE AS FILL MATERIAL. SCREENED NATIVE MATERIALS SHALL BE FREE OF ORGANIC MATTER, DELETERIOUS MATERIALS, AND ROCKS OR OTHER OBJECTS LARGER THAN 2 INCHES.
   - 2.4. ALL FILL SHALL BE COMPACTED TO THE FOLLOWING MINIMUM RELATIVE COMPACTION CRITERIA:
     - 2.4.1. BASE MATERIAL UNDER ROADWAYS, CURB, AND GUTTER: 95 PERCENT
     - 2.4.2. BASE MATERIAL UNDER CATCH BASINS AND MAINTENANCE HOLES: 95 PERCENT
     - 2.4.3. BASE MATERIAL UNDER NON-TRAFFIC AREAS: 90 PERCENT
     - 2.4.4. SOIL BACKFILL: 90 PERCENT
     - 2.4.5. DISTURBED SUBGRADE: 90 PERCENT
3. PIPE AND FITTINGS:
   - 3.1. PIPE AND FITTINGS:
     - 3.1.1. PIPE BETWEEN PRETREATMENT CHAMBER AND DRYWELL: PVC SCH 40
     - 3.1.2. SUBDRAINS: PVC SCH 40 PERFORATED WITH 1/2-INCH DIAMETER PERFORATIONS; 2 ROWS AT 120 DEGREES APART AND 5 INCHES ON CENTER; PLACE PERFORATIONS FACING DOWN
     - 3.1.3. ALL OTHER PIPE AND FITTINGS: PVC SDR-35 UNLESS OTHERWISE SHOWN ON DRAWINGS
     - 3.1.4. PROVIDE FITTINGS AND ADAPTERS AS NECESSARY TO COMPLETE WORK
   - 3.2. PROVIDE MINIMUM SLOPE OF 1 PERCENT UNLESS OTHERWISE SHOWN ON DRAWINGS
   - 3.3. PIPE BEDDING, WHERE REQUIRED, SHALL BE ONE OF THE FOLLOWING:
     - 3.3.1. SAND
     - 3.3.2. GREENBOOK SECTION 200-1.2.1 1/2-INCH CRUSHED ROCK
     - 3.3.3. UNDISTURBED NATIVE FREE DRAINING MATERIAL
4. DRAINAGE STRUCTURES:
   - 4.1. PRETREATMENT CHAMBER AND/OR DRYWELL SYSTEM: "TORRENT RESOURCES MAXWELL DRAINAGE SYSTEM"
   - 4.2. CLEANOUT ACCESS FRAME AND COVER: CAST IRON ROUND (LONG BEACH IRON WORKS 1241/X-510B)
   - 4.3. PIPE SCREEN: 304 STAINLESS STEEL OR GALVANIZED STEEL, 16 GAGE MINIMUM THICKNESS, WITH 5 MILLIMETER PERFORATIONS AND 51% OPEN SPACE (BIO CLEAN CONNECTOR PIPE SCREEN U-3.7); ANCHOR WITH 304 OR 316 STAINLESS STEEL CONCRETE ANCHORS
5. ROCK MATERIALS:
   - 5.1. BASE: GREENBOOK SECTION 200-2.2 CRUSHED AGGREGATE BASE
   - 5.2. GRAVEL DRAINAGE LAYER: GREENBOOK SECTION 200-1.2 1-INCH" CRUSHED ROCK
6. GEOTEXTILE/GEOMEMBRANE:
   - 6.1. NON-WOVEN GEOTEXTILE: GREENBOOK SECTION 213-5 NON-WOVEN TYPE 90N (TENCATE MIRAFI 140N)
7. CONCRETE MATERIALS:
   - 7.1. CONCRETE CURB, GUTTER, AND SIDEWALK: GREENBOOK SECTION 201-1 CLASS 520-C-2500
   - 7.2. OTHER CAST-IN-PLACE OR PRECAST DRAINAGE STRUCTURES: GREENBOOK SECTION 201-1 CLASS 560-C-3250
   - 7.3. NON-SHRINK GROUT: GREENBOOK SECTION 201-7.3
   - 7.4. MORTAR: GREENBOOK SECTION 201-5 CLASS C
   - 7.5. CONCRETE SLURRY:
     - 7.5.1. DRYWELL BACKFILL: TWO-SACK SLURRY
     - 7.5.2. ALL OTHER APPLICATIONS: GREENBOOK SECTION 201-1 CLASS 100-E-100
   - 7.6. CONCRETE JOINTS: GREENBOOK SECTION 303-5.4
   - 7.7. PREMOLDED JOINT FILLER: GREENBOOK SECTION 201-3.2 NONEXTRUDING AND RESILIENT FILLER (BITUMINOUS)
   - 7.8. CONCRETE FINISH: GREENBOOK SECTION 303-5.5
   - 7.9. CONCRETE CURING: GREENBOOK SECTION 201-4.1 TYPE 1-D MEMBRANE CURING COMPOUND
   - 7.10. EPOXY ADHESIVE ANCHOR: HILTI HIT-RE 100
8. BITUMINOUS MATERIALS:
   - 8.1. SURFACE ASPHALT CONCRETE COURSE: GREENBOOK/BROWNBOOK SECTION 203-6.4 CLASS D2-PG-64-10
   - 8.2. BASE ASPHALT CONCRETE COURSE: GREENBOOK/BROWNBOOK SECTION 203-6.4 CLASS B-PG-64-10
9. LADNSCAPE MATERIALS:
   - 9.1. PLANTING SOIL SHALL BE ONE OF THE FOLLOWING UNLESS OTHERWISE SPECIFIED:
     - 9.1.1. 50-50 MIX OF SELECT ON-SITE SOIL APPROVED BY THE ENGINEER WITH ORGANIC COMPOST MATERIAL
     - 9.1.2. 50-50 MIX OF SSPWC SECTION 800-1.1 CLASS "A" TOPSOIL WITH ORGANIC COMPOST MATERIAL
   - 9.2. COMPACT PLANTING SOIL TO 80 PERCENT RELATIVE COMPACTION MINIMUM
   - 9.3. DECORATIVE GRAVEL MULCH: 1/2-INCH LIGHT COLORED CRUSHED GRAVEL (DECORATIVE STONE SOLUTIONS "KETTLE", "CROWN GRANITE", OR "SANTA ROSA")

## ABBREVIATIONS

| | |
|---|---|
| ACP | ASPHALT CONCRETE PAVEMENT |
| ASTM | AMERICAN SOCIETY FOR TESTING AND MATERIALS |
| AVE | AVENUE |
| BLVD | BOULEVARD |
| BMP | BEST MANAGEMENT PRACTICE |
| BGS | BELOW GROUND SURFACE |
| CF | CURB FACE |
| CI | CAST IRON |
| CL | CENTERLINE |
| DG | DISINTEGRATED GRANITE |
| DTL | DETAIL |
| DWP | LOS ANGELES DEPARTMENT OF WATER AND POWER |
| E | EAST |
| EL | ELEVATION |
| EW | EACH WAY |
| GTE | GENERAL TELEPHONE AND ELECTRONICS CORPORATION |
| HDPE | HIGH-DENSITY POLYETHYLENE |
| ID | INSIDE DIAMETER |
| LACFCD | LOS ANGELES COUNTY FLOOD CONTROL DISTRICT |
| LADWP | LOS ANGELES DEPARTMENT OF WATER AND POWER |
| LASAN | LOS ANGELES SANITATION AND ENVIRONMENT |
| LF | LINEAR FEET |
| MAX | MAXIMUM |
| MH | MAINTENANCE HOLE |
| MOL | METRO ORANGE LINE |
| MIN | MINIMUM |
| MWD | METROPOLITAN WATER DISTRICT OF SOUTHERN CALIFORNIA |
| N | NORTH |
| NTS | NOT TO SCALE |
| OC | ON CENTER |
| OD | OUTER DIAMETER |
| PSI | POUNDS PER SQUARE INCH |
| PVC | POLYVINYL CHLORIDE |
| S | SOUTH |
| SCG | SOUTHERN CALIFORNIA GAS COMPANY |
| SCH | SCHEDULE |
| ST | STREET |
| TBD | TO BE DETERMINED |
| TYP | TYPICAL |
| W | WEST |

FOR SAFE CLEAN WATER
PROGRAM APPLICATION
NOT FOR CONSTRUCTION

THE PREPARATION OF THIS DRAWING HAS BEEN FINANCED IN PART THROUGH A GRANT FROM THE U.S. DEPARTMENT OF TRANSPORTATION, FEDERAL TRANSIT ADMINISTRATION (FTA), UNDER THE FEDERAL TRANSIT ACT OF 1964, AS AMENDED, AND IN PART BY THE TAXES OF THE CITIZENS OF LOS ANGELES COUNTY AND OF THE STATE OF CALIFORNIA.

| REV | DATE | BY | APP | REG. NO. | EXPIRES | SEAL HOLDER | DESCRIPTION |
|---|---|---|---|---|---|---|---|
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |

DESIGNED BY XXXXXXXX
DRAWN BY XXXXXXXX
CHECK BY XXXXXXXX
IN CHARGE XXXXXXXX
DATE XX/XX/XXXX

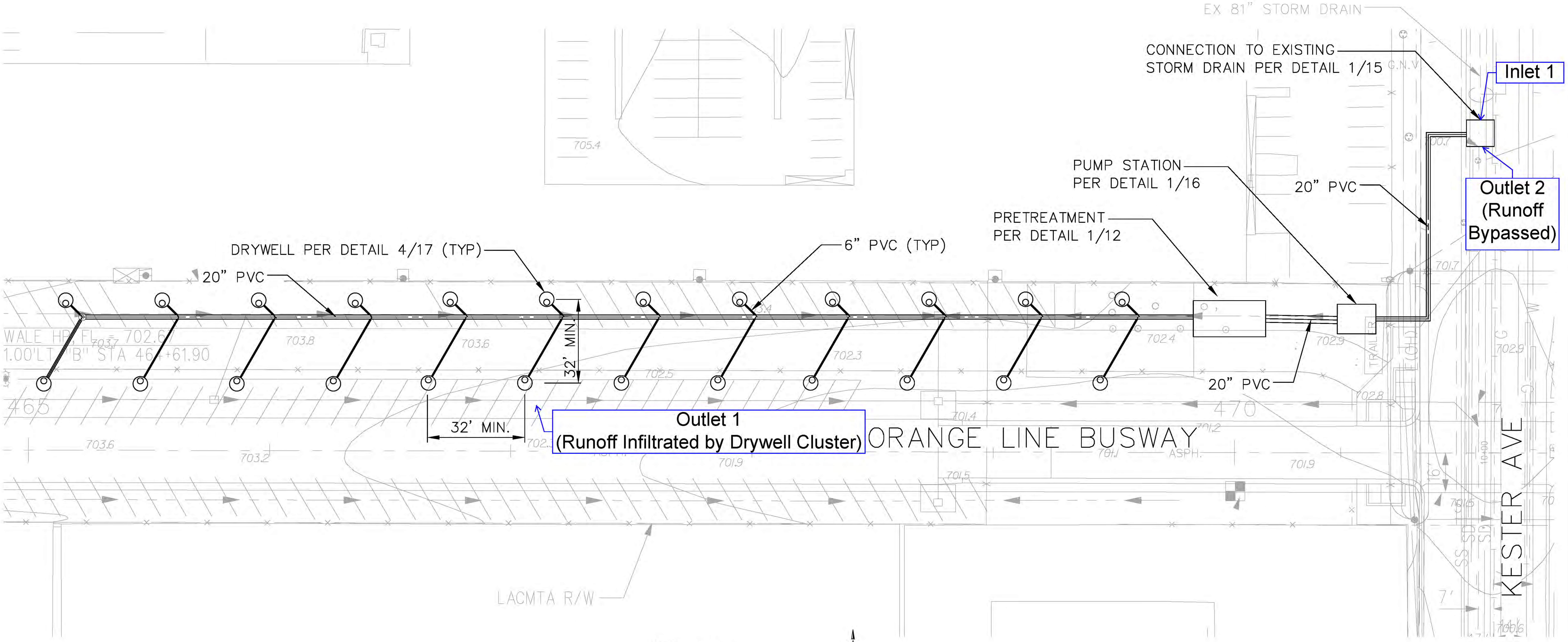
FOR
REVIEW
ONLY
NOT FOR
CONSTRUCTION

Metro
LOS ANGELES COUNTY
METROPOLITAN TRANSPORTATION AUTHORITY

METRO ORANGE LINE STORM WATER
CAPTURE AND RECHARGE
NOTES, ABBREVIATIONS & SYMBOLS

CONTRACT NO XXXXX
DRAWING NO XX-X-XXX
REV 0
SCALE NTS
SHEET NO 2 OF 18

Preliminary Figure for SCW Application - Subject to Change



1 PLAN
SCALE: 1"=20'

FOR SAFE CLEAN WATER
PROGRAM APPLICATION
NOT FOR CONSTRUCTION

THE PREPARATION OF THIS DRAWING HAS BEEN FINANCED IN PART THROUGH A GRANT FROM THE U.S. DEPARTMENT OF TRANSPORTATION, FEDERAL TRANSIT ADMINISTRATION (FTA), UNDER THE FEDERAL TRANSIT ACT OF 1964, AS AMENDED, AND IN PART BY THE TAXES OF THE CITIZENS OF LOS ANGELES COUNTY AND OF THE STATE OF CALIFORNIA.

| REV | DATE | BY | APP | REG. NO. | EXPIRES | SEAL HOLDER | DESCRIPTION |
|---|---|---|---|---|---|---|---|

DESIGNED BY XXXXXXXX
DRAWN BY XXXXXXXX
CHECK BY XXXXXXXX
IN CHARGE XXXXXXXX
DATE XX/XX/XXXX

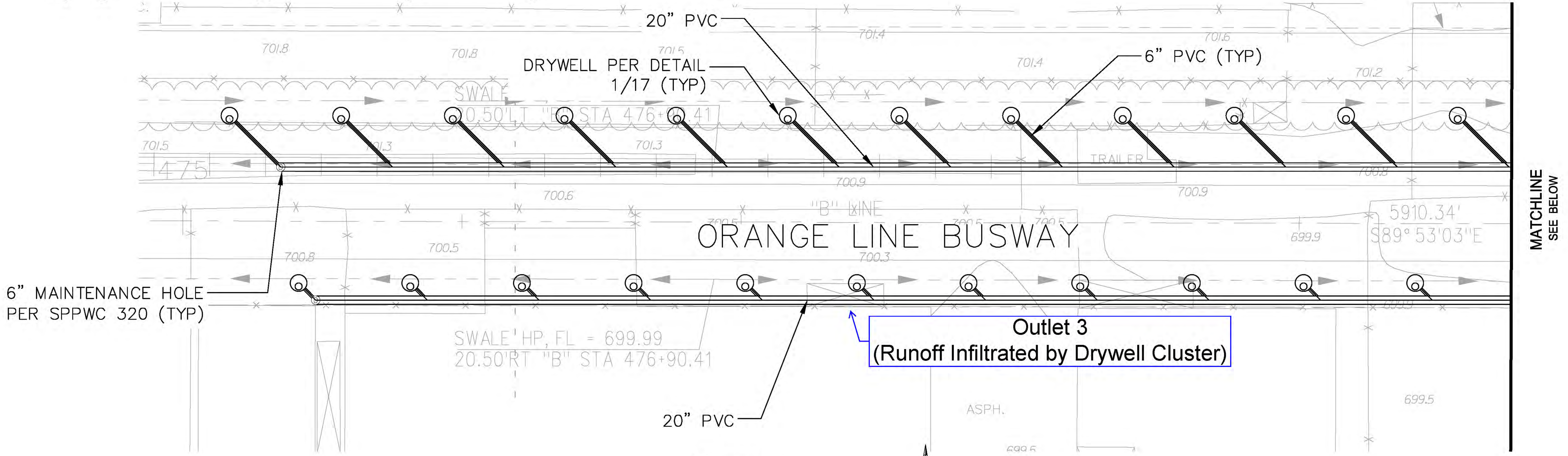
FOR
REVIEW
ONLY
NOT FOR
CONSTRUCTION

Metro
LOS ANGELES COUNTY
METROPOLITAN TRANSPORTATION AUTHORITY

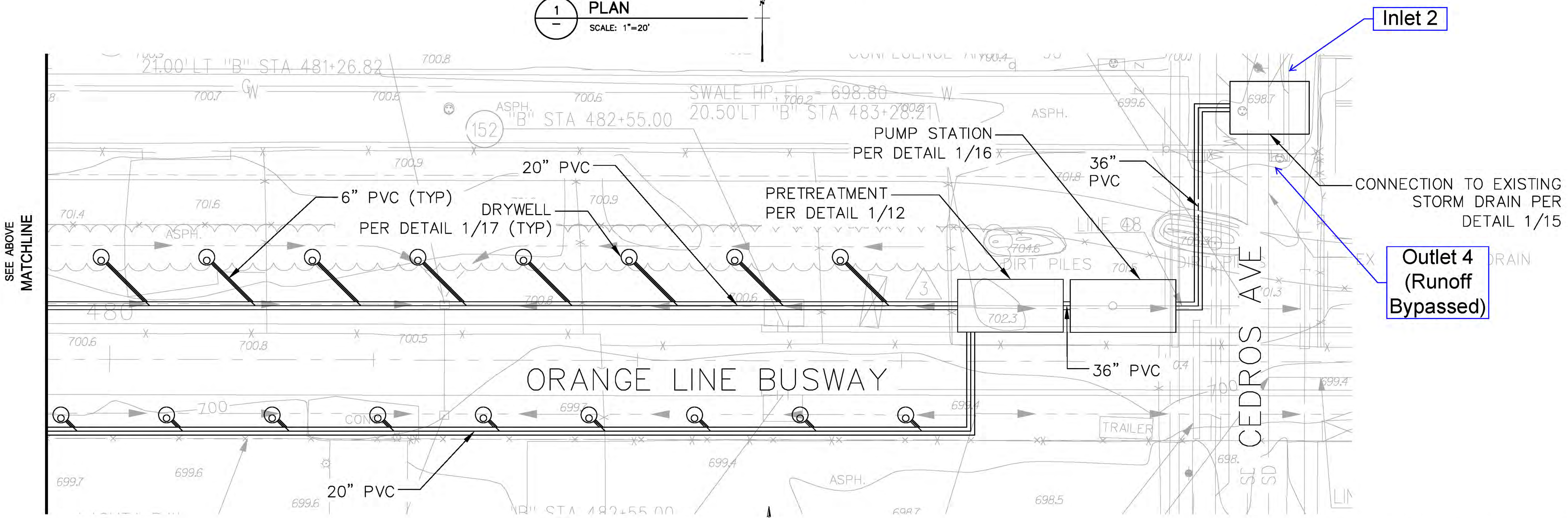
METRO ORANGE LINE STORM WATER
CAPTURE AND RECHARGE
MOL 1

CONTRACT NO XXXXX
DRAWING NO XX-X-XXX
REV 0
SCALE SCALE: 1"=20'
SHEET NO 3 OF 18

Preliminary Figure for SCW Application - Subject to Change



1 PLAN
SCALE: 1"=20'



1 PLAN
SCALE: 1"=20'

FOR SAFE CLEAN WATER
PROGRAM APPLICATION
NOT FOR CONSTRUCTION

THE PREPARATION OF THIS DRAWING HAS BEEN FINANCED IN PART THROUGH A GRANT FROM THE U.S. DEPARTMENT OF TRANSPORTATION, FEDERAL TRANSIT ADMINISTRATION (FTA), UNDER THE FEDERAL TRANSIT ACT OF 1964, AS AMENDED, AND IN PART BY THE TAXES OF THE CITIZENS OF LOS ANGELES COUNTY AND OF THE STATE OF CALIFORNIA.

| REV | DATE | BY | APP | REG. NO. | EXPIRES | SEAL HOLDER | DESCRIPTION |
|---|---|---|---|---|---|---|---|

DESIGNED BY XXXXXXXX
DRAWN BY XXXXXXXX
CHECK BY XXXXXXXX
IN CHARGE XXXXXXXX
DATE XX/XX/XXXX

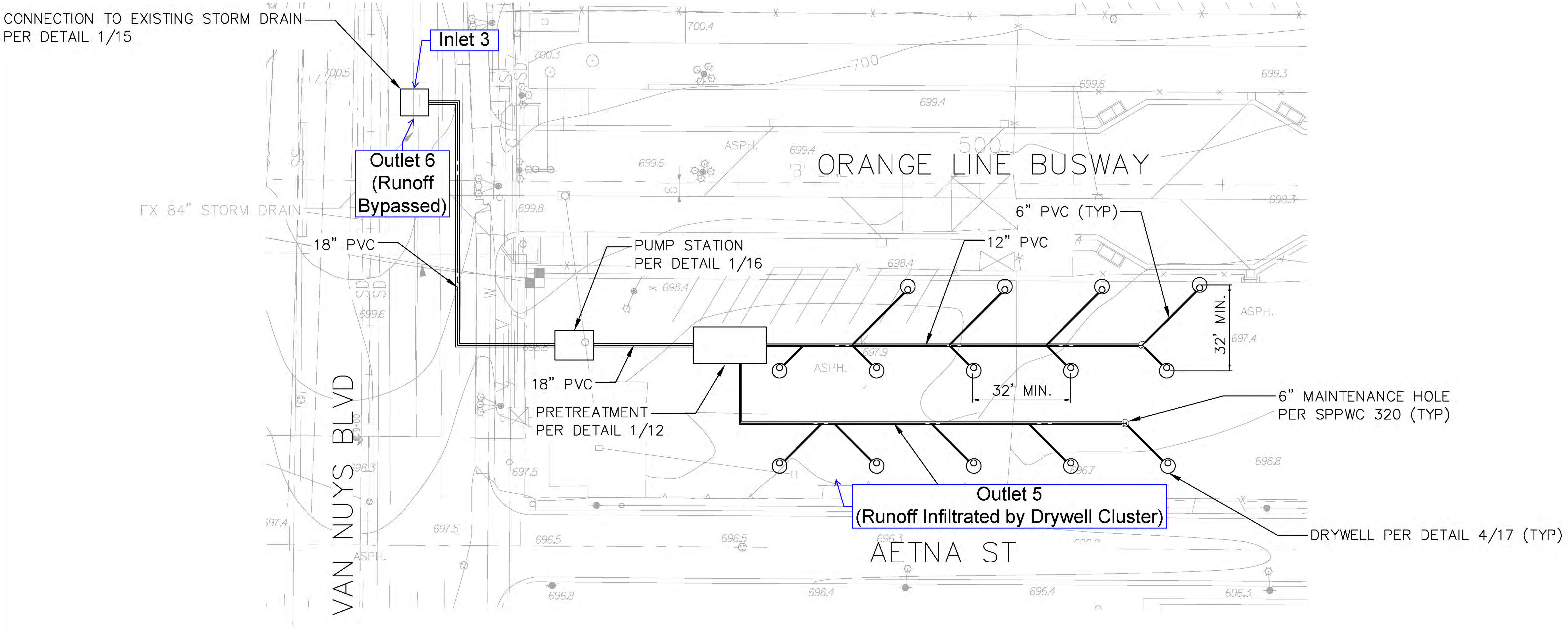
FOR
REVIEW
ONLY
NOT FOR
CONSTRUCTION

Metro
LOS ANGELES COUNTY
METROPOLITAN TRANSPORTATION AUTHORITY

METRO ORANGE LINE STORM WATER
CAPTURE AND RECHARGE
MOL 2

CONTRACT NO XXXXX
DRAWING NO XX-X-XXX
REV 0
SCALE SCALE: 1"=20'
SHEET NO 4 OF 18

Preliminary Figure for SCW Application - Subject to Change



1 PLAN
SCALE: 1"=20'

FOR SAFE CLEAN WATER
PROGRAM APPLICATION
NOT FOR CONSTRUCTION

THE PREPARATION OF THIS DRAWING HAS BEEN FINANCED IN PART THROUGH A GRANT FROM THE U.S. DEPARTMENT OF TRANSPORTATION, FEDERAL TRANSIT ADMINISTRATION (FTA), UNDER THE FEDERAL TRANSIT ACT OF 1964, AS AMENDED, AND IN PART BY THE TAXES OF THE CITIZENS OF LOS ANGELES COUNTY AND OF THE STATE OF CALIFORNIA.

| REV | DATE | BY | APP | REG. NO. | EXPIRES | SEAL HOLDER | DESCRIPTION |
|---|---|---|---|---|---|---|---|

DESIGNED BY XXXXXXXX
DRAWN BY XXXXXXXX
CHECK BY XXXXXXXX
IN CHARGE XXXXXXXX
DATE XX/XX/XXXX

FOR
REVIEW
ONLY
NOT FOR
CONSTRUCTION

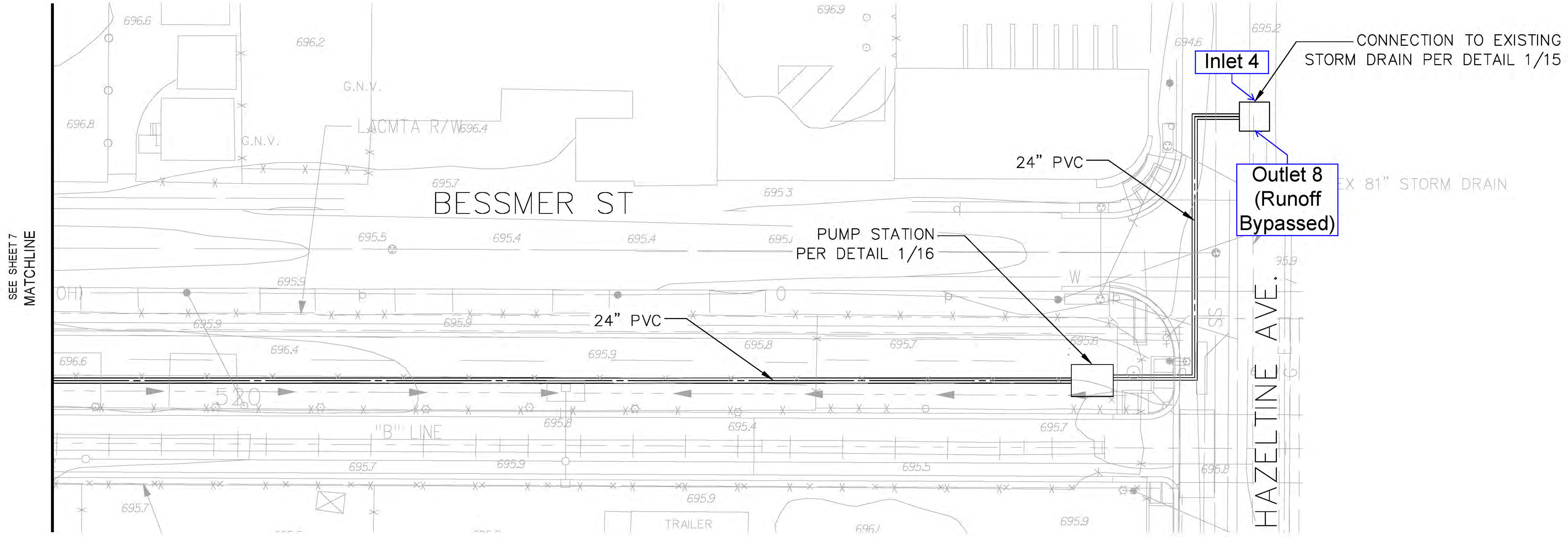
Metro

LOS ANGELES COUNTY
METROPOLITAN TRANSPORTATION AUTHORITY

METRO ORANGE LINE STORM WATER
CAPTURE AND RECHARGE
MOL 3

CONTRACT NO XXXXX
DRAWING NO XX-X-XXX
REV 0
SCALE SCALE: 1"=20'
SHEET NO 5 OF 18

Preliminary Figure for SCW Application - Subject to Change



1 PLAN
SCALE: 1"=20'

FOR SAFE CLEAN WATER
PROGRAM APPLICATION
NOT FOR CONSTRUCTION

THE PREPARATION OF THIS DRAWING HAS BEEN FINANCED IN PART THROUGH A GRANT FROM THE U.S. DEPARTMENT OF TRANSPORTATION, FEDERAL TRANSIT ADMINISTRATION (FTA), UNDER THE FEDERAL TRANSIT ACT OF 1964, AS AMENDED, AND IN PART BY THE TAXES OF THE CITIZENS OF LOS ANGELES COUNTY AND OF THE STATE OF CALIFORNIA.

| REV | DATE | BY | APP | REG. NO. | EXPIRES | SEAL HOLDER | DESCRIPTION |
|---|---|---|---|---|---|---|---|

DESIGNED BY XXXXXXXX
DRAWN BY XXXXXXXX
CHECK BY XXXXXXXX
IN CHARGE XXXXXXXX
DATE XX/XX/XXXX

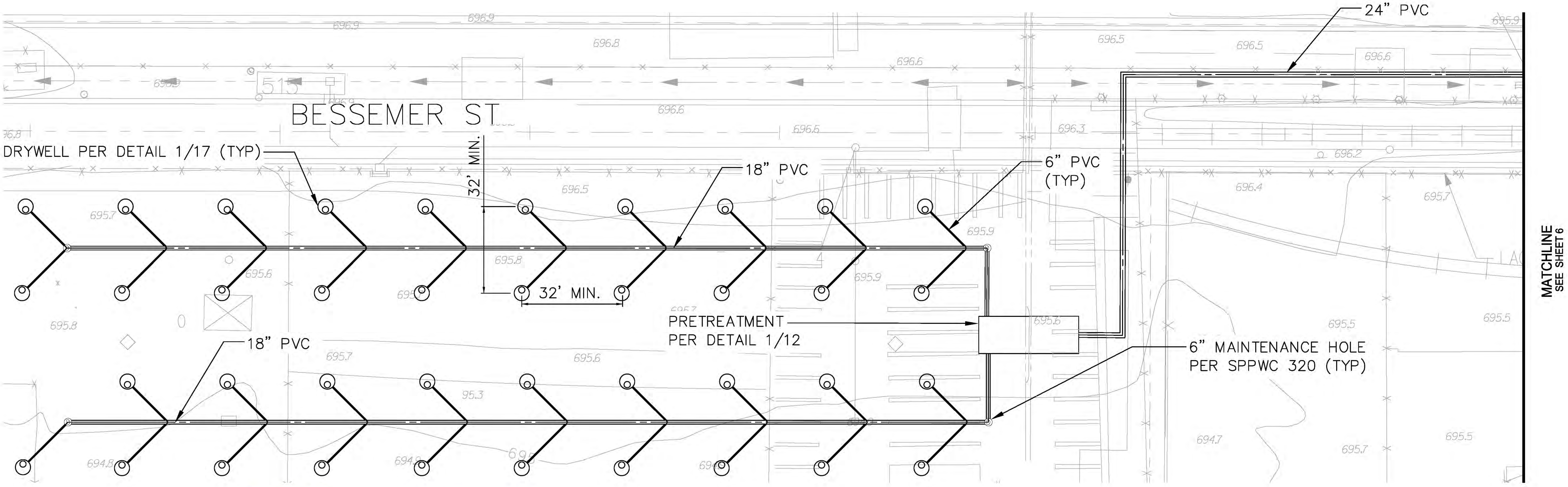
FOR
REVIEW
ONLY
NOT FOR
CONSTRUCTION

Metro
LOS ANGELES COUNTY
METROPOLITAN TRANSPORTATION AUTHORITY

METRO ORANGE LINE STORM WATER
CAPTURE AND RECHARGE
MOL 4
SHEET 1 OF 2

CONTRACT NO XXXXX
DRAWING NO XX-X-XXX
REV 0
SCALE SCALE: 1"=20'
SHEET NO 6 OF 18

Preliminary Figure for SCW Application - Subject to Change



Outlet 7
(Runoff infiltrated by Drywell Cluster)

1 PLAN
SCALE: 1"=20'

FOR SAFE CLEAN WATER
PROGRAM APPLICATION
NOT FOR CONSTRUCTION

THE PREPARATION OF THIS DRAWING HAS BEEN FINANCED IN PART THROUGH A GRANT FROM THE U.S. DEPARTMENT OF TRANSPORTATION, FEDERAL TRANSIT ADMINISTRATION (FTA), UNDER THE FEDERAL TRANSIT ACT OF 1964, AS AMENDED, AND IN PART BY THE TAXES OF THE CITIZENS OF LOS ANGELES COUNTY AND OF THE STATE OF CALIFORNIA.

| REV | DATE | BY | APP | REG. NO. | EXPIRES | SEAL HOLDER | DESCRIPTION |
|---|---|---|---|---|---|---|---|

DESIGNED BY XXXXXXXX
DRAWN BY XXXXXXXX
CHECK BY XXXXXXXX
IN CHARGE XXXXXXXX
DATE XX/XX/XXXX

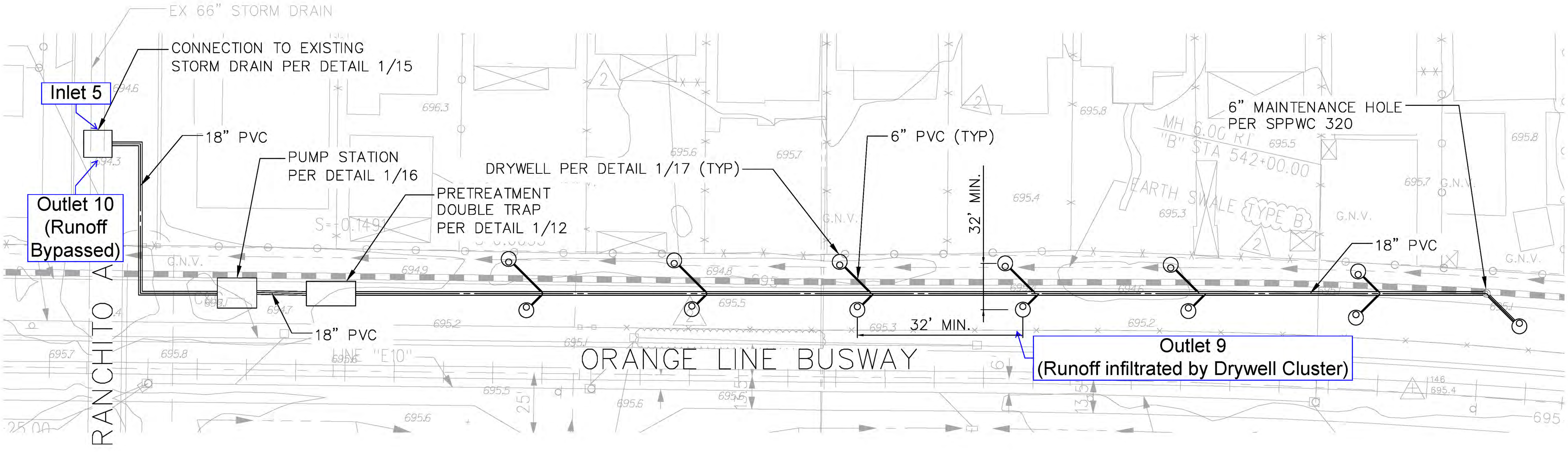
FOR
REVIEW
ONLY
NOT FOR
CONSTRUCTION

Metro
LOS ANGELES COUNTY
METROPOLITAN TRANSPORTATION AUTHORITY

METRO ORANGE LINE STORM WATER
CAPTURE AND RECHARGE
MOL 4
SHEET 2 OF 2

CONTRACT NO XXXXX
DRAWING NO XX-X-XXX
REV 0
SCALE
SHEET NO 7 OF 18

Preliminary Figure for SCW Application - Subject to Change



1 PLAN
SCALE: 1"=20'

FOR SAFE CLEAN WATER
PROGRAM APPLICATION
NOT FOR CONSTRUCTION

THE PREPARATION OF THIS DRAWING HAS BEEN FINANCED IN PART THROUGH A GRANT FROM THE U.S. DEPARTMENT OF TRANSPORTATION, FEDERAL TRANSIT ADMINISTRATION (FTA), UNDER THE FEDERAL TRANSIT ACT OF 1964, AS AMENDED, AND IN PART BY THE TAXES OF THE CITIZENS OF LOS ANGELES COUNTY AND OF THE STATE OF CALIFORNIA.

| REV | DATE | BY | APP | REG. NO. | EXPIRES | SEAL HOLDER | DESCRIPTION |
|---|---|---|---|---|---|---|---|

DESIGNED BY XXXXXXXX
DRAWN BY XXXXXXXX
CHECK BY XXXXXXXX
IN CHARGE XXXXXXXX
DATE XX/XX/XXXX

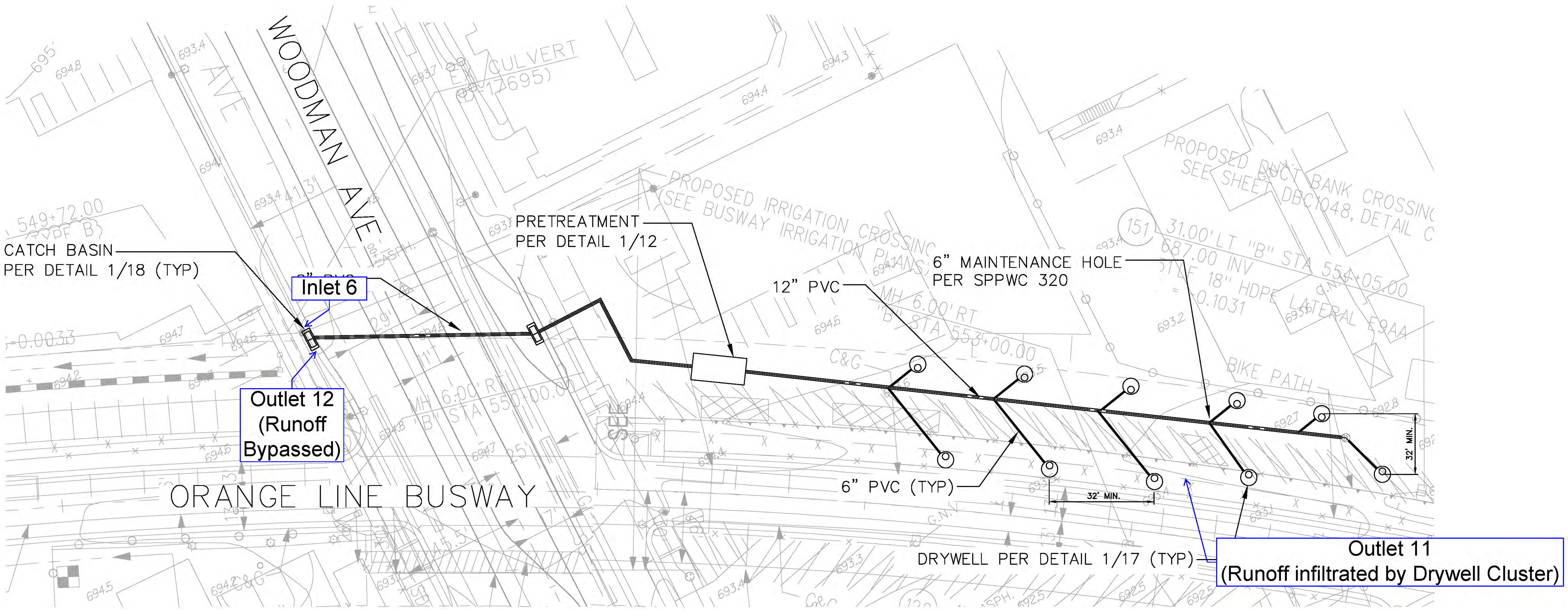
FOR
REVIEW
ONLY
NOT FOR
CONSTRUCTION

Metro
LOS ANGELES COUNTY
METROPOLITAN TRANSPORTATION AUTHORITY

METRO ORANGE LINE STORM WATER
CAPTURE AND RECHARGE
MOL 5

CONTRACT NO XXXXX
DRAWING NO XX-X-XXX
REV 0
SCALE SCALE: 1"=20'
SHEET NO 8 OF 18

Preliminary Figure for SCW Application - Subject to Change



1 PLAN
SCALE: 1"=20'

FOR SAFE CLEAN WATER
PROGRAM APPLICATION
NOT FOR CONSTRUCTION

THE PREPARATION OF THIS DRAWING HAS BEEN FINANCED IN PART THROUGH A GRANT FROM THE U.S. DEPARTMENT OF TRANSPORTATION, FEDERAL TRANSIT ADMINISTRATION (FTA), UNDER THE FEDERAL TRANSIT ACT OF 1964, AS AMENDED, AND IN PART BY THE TAXES OF THE CITIZENS OF LOS ANGELES COUNTY AND OF THE STATE OF CALIFORNIA.

| REV | DATE | BY | APP | REG. NO. | EXPIRES | SEAL HOLDER | DESCRIPTION |
|---|---|---|---|---|---|---|---|

DESIGNED BY XXXXXXXX
DRAWN BY XXXXXXXX
CHECK BY XXXXXXXX
IN CHARGE XXXXXXXX
DATE XX/XX/XXXX

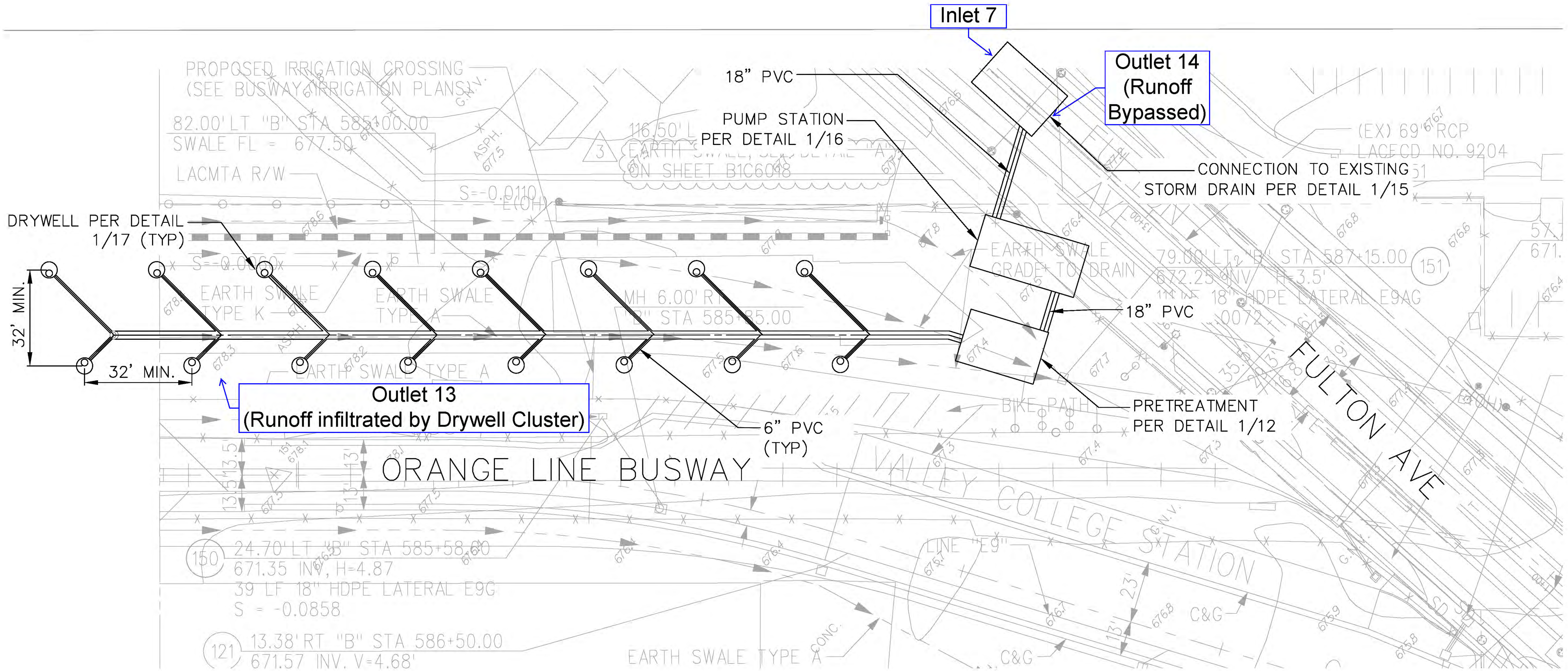
FOR REVIEW ONLY NOT FOR CONSTRUCTION

Metro
LOS ANGELES COUNTY
METROPOLITAN TRANSPORTATION AUTHORITY

METRO ORANGE LINE STORM WATER
CAPTURE AND RECHARGE
MOL 6

CONTRACT NO XXXXX
DRAWING NO XX-X-XXX
REV 0
SCALE SCALE: 1"=20'
SHEET NO 9 OF 18

Preliminary Figure for SCW Application - Subject to Change



1 PLAN
SCALE: 1"=20'

FOR SAFE CLEAN WATER
PROGRAM APPLICATION
NOT FOR CONSTRUCTION

THE PREPARATION OF THIS DRAWING HAS BEEN FINANCED IN PART THROUGH A GRANT FROM THE U.S. DEPARTMENT OF TRANSPORTATION, FEDERAL TRANSIT ADMINISTRATION (FTA), UNDER THE FEDERAL TRANSIT ACT OF 1964, AS AMENDED, AND IN PART BY THE TAXES OF THE CITIZENS OF LOS ANGELES COUNTY AND OF THE STATE OF CALIFORNIA.

| REV | DATE | BY | APP | REG. NO. | EXPIRES | SEAL HOLDER | DESCRIPTION |
|---|---|---|---|---|---|---|---|

DESIGNED BY XXXXXXXX
DRAWN BY XXXXXXXX
CHECK BY XXXXXXXX
IN CHARGE XXXXXXXX
DATE XX/XX/XXXX

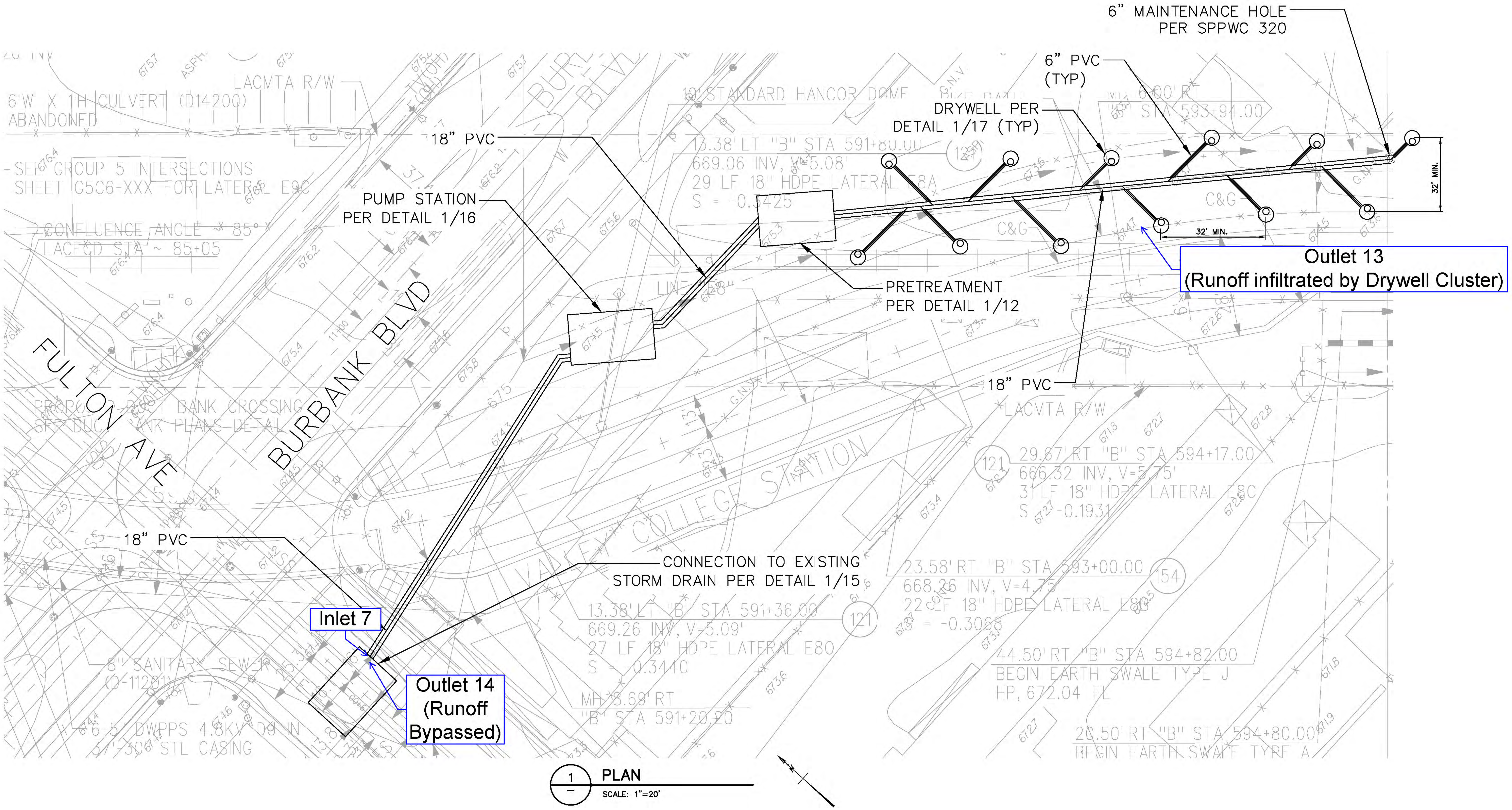
FOR
REVIEW
ONLY
NOT FOR
CONSTRUCTION

Metro
LOS ANGELES COUNTY
METROPOLITAN TRANSPORTATION AUTHORITY

METRO ORANGE LINE STORM WATER
CAPTURE AND RECHARGE
MOL 7
SHEET 1 OF 2

CONTRACT NO XXXXX
DRAWING NO XX-X-XXX
REV 0
SCALE SCALE: 1"=20'
SHEET NO 10 OF 18

Preliminary Figure for SCW Application - Subject to Change



**PLAN** ①

SCALE: 1"=20'

FOR SAFE CLEAN WATER
PROGRAM APPLICATION
NOT FOR CONSTRUCTION

| REV | DATE | BY | APP | REG. NO. | EXPIRES | SEAL HOLDER | DESCRIPTION |
|---|---|---|---|---|---|---|---|

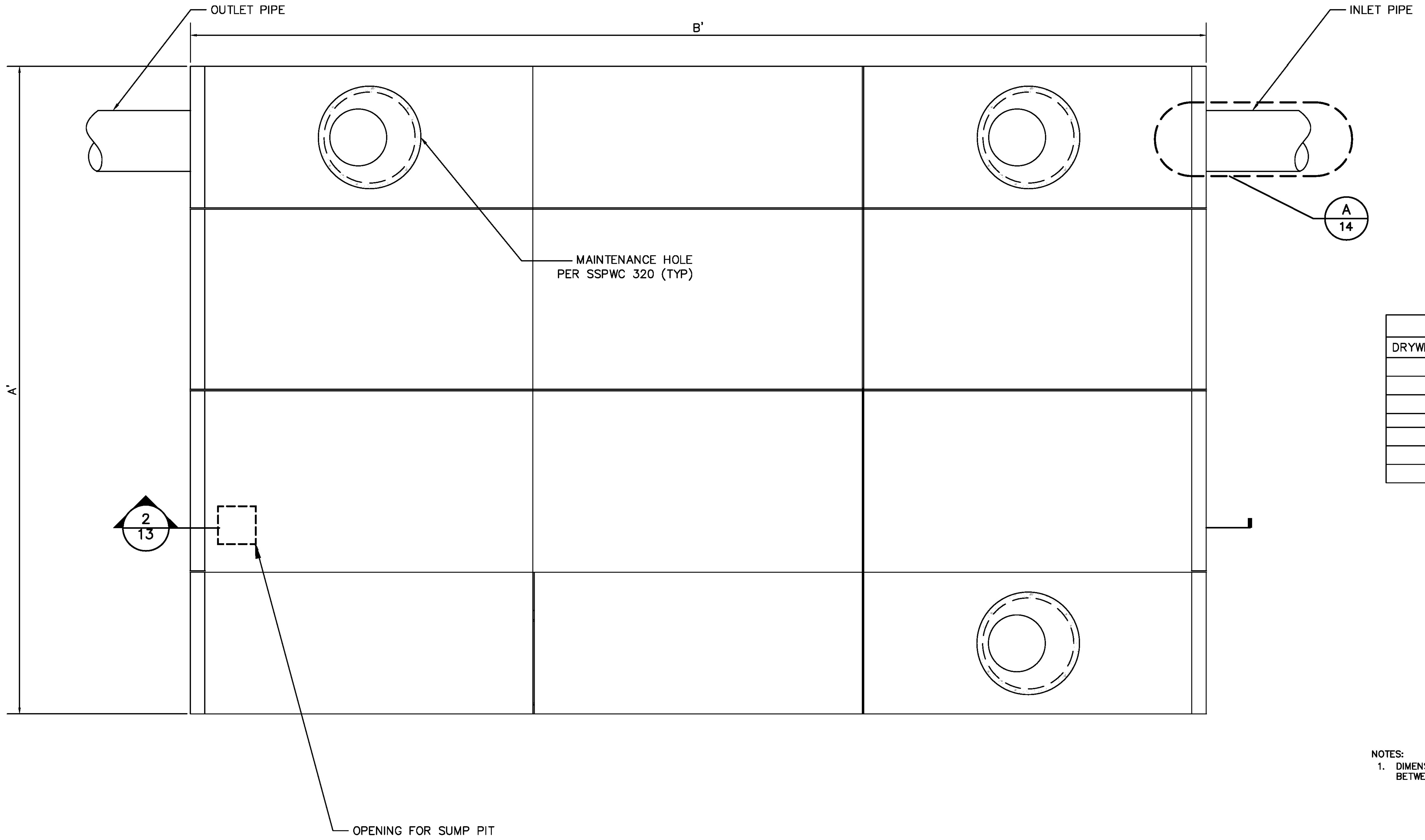
DESIGNED BY XXXXXXXX
DRAWN BY XXXXXXXX
CHECK BY XXXXXXXX
IN CHARGE XXXXXXXX
DATE XX/XX/XXXX

FOR
REVIEW
ONLY
NOT FOR
CONSTRUCTION

Metro
LOS ANGELES COUNTY
METROPOLITAN TRANSPORTATION AUTHORITY

METRO ORANGE LINE STORM WATER
CAPTURE AND RECHARGE
MOL 7
SHEET 2 OF 2

CONTRACT NO XXXXX
DRAWING NO XX-X-XXX
REV 0
SCALE
SHEET NO 11 OF 18



## 1 PLAN
NOT TO SCALE

| DIMENSIONS | | |
|---|---|---|
| DRYWELL CLUSTER ID | A | B |
| MOL1 | 15 | 30 |
| MOL2 | 20 | 30 |
| MOL3 | 10 | 30 |
| MOL4 | 15 | 40 |
| MOL5 | 10 | 20 |
| MOL6 | 10 | 20 |
| MOL7 | 10 | 25 |

NOTES:
1. DIMENSIONING OF STORMTRAP SYSTEM SHOW BELOW ALLOW FOR A $\frac{3}{4}$" GAP BETWEEN EACH MODULE.

FOR SAFE CLEAN WATER
PROGRAM APPLICATION
NOT FOR CONSTRUCTION

THE PREPARATION OF THIS DRAWING HAS BEEN FINANCED IN PART THROUGH A GRANT FROM THE U.S. DEPARTMENT OF TRANSPORTATION, FEDERAL TRANSIT ADMINISTRATION (FTA), UNDER THE FEDERAL TRANSIT ACT OF 1964, AS AMENDED, AND IN PART BY THE TAXES OF THE CITIZENS OF LOS ANGELES COUNTY AND OF THE STATE OF CALIFORNIA.

| REV | DATE | BY | APP | REG. NO. | EXPIRES | SEAL HOLDER | DESCRIPTION |
|---|---|---|---|---|---|---|---|

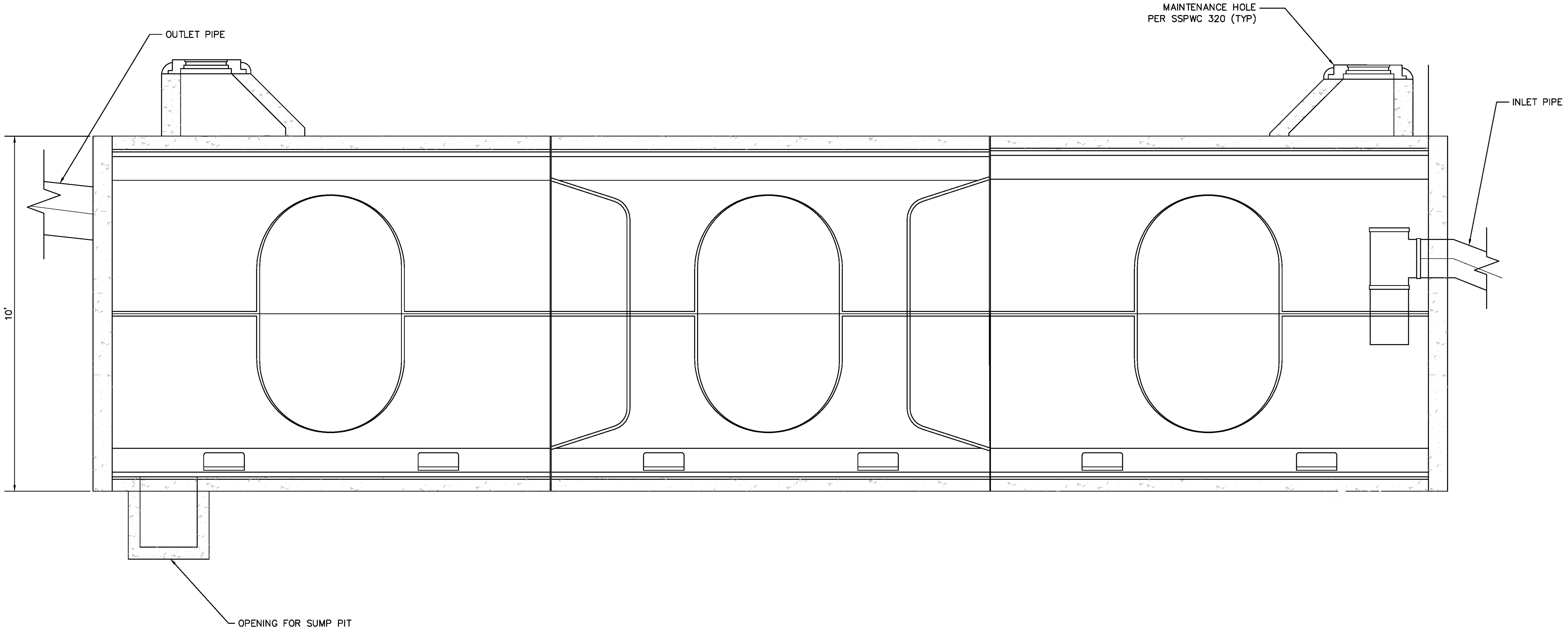
DESIGNED BY
XXXXXXXX
DRAWN BY
XXXXXXXX
CHECK BY
XXXXXXXX
IN CHARGE
XXXXXXXX
DATE
XX/XX/XXXX

FOR
REVIEW
ONLY
NOT FOR
CONSTRUCTION

Metro
LOS ANGELES COUNTY
METROPOLITAN TRANSPORTATION AUTHORITY

METRO ORANGE LINE STORM WATER
CAPTURE AND RECHARGE
PRETREATMENT DETAIL

CONTRACT NO
XXXXX
DRAWING NO
REV
0
SCALE
NTS
SHEET NO
12 OF 18



2
12
**SECTION**
NOT TO SCALE

FOR SAFE CLEAN WATER
PROGRAM APPLICATION
NOT FOR CONSTRUCTION

THE PREPARATION OF THIS DRAWING HAS BEEN FINANCED IN PART THROUGH A GRANT FROM THE U.S. DEPARTMENT OF TRANSPORTATION, FEDERAL TRANSIT ADMINISTRATION (FTA), UNDER THE FEDERAL TRANSIT ACT OF 1964, AS AMENDED, AND IN PART BY THE TAXES OF THE CITIZENS OF LOS ANGELES COUNTY AND OF THE STATE OF CALIFORNIA.

| REV | DATE | BY | APP | REG. NO. | EXPIRES | SEAL HOLDER | DESCRIPTION |
|---|---|---|---|---|---|---|---|

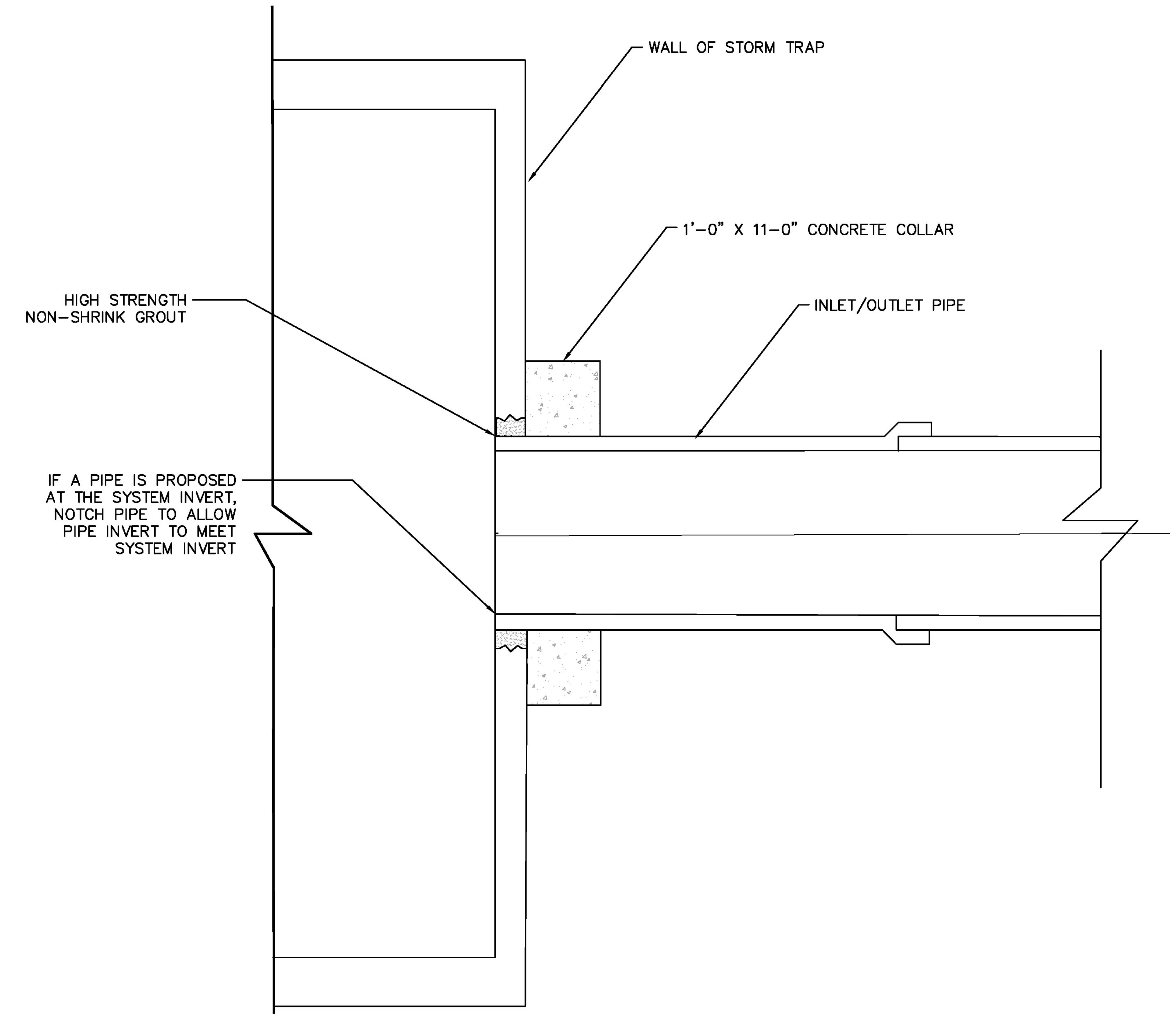
DESIGNED BY XXXXXXXX
DRAWN BY XXXXXXXX
CHECK BY XXXXXXXX
IN CHARGE XXXXXXXX
DATE XX/XX/XXXX

FOR
REVIEW
ONLY
NOT FOR
CONSTRUCTION

Metro
LOS ANGELES COUNTY
METROPOLITAN TRANSPORTATION AUTHORITY

METRO ORANGE LINE STORM WATER
CAPTURE AND RECHARGE
PRETREATMENT DETAIL
SECTION

CONTRACT NO XXXXX
DRAWING NO
REV 0
SCALE NTS
SHEET NO 13 OF 18



B
–

## PIPE CONNECTION DETAIL

NOT TO SCALE

FOR SAFE CLEAN WATER
PROGRAM APPLICATION
NOT FOR CONSTRUCTION

THE PREPARATION OF THIS DRAWING HAS BEEN FINANCED IN PART THROUGH A GRANT FROM THE U.S. DEPARTMENT OF TRANSPORTATION, FEDERAL TRANSIT ADMINISTRATION (FTA), UNDER THE FEDERAL TRANSIT ACT OF 1964, AS AMENDED, AND IN PART BY THE TAXES OF THE CITIZENS OF LOS ANGELES COUNTY AND OF THE STATE OF CALIFORNIA.

| REV | DATE | BY | APP | REG. NO. | EXPIRES | SEAL HOLDER | DESCRIPTION |
|---|---|---|---|---|---|---|---|
|  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |

DESIGNED BY
XXXXXXXX
DRAWN BY
XXXXXXXX
CHECK BY
XXXXXXXX
IN CHARGE
XXXXXXXX
DATE
XX/XX/XXXX

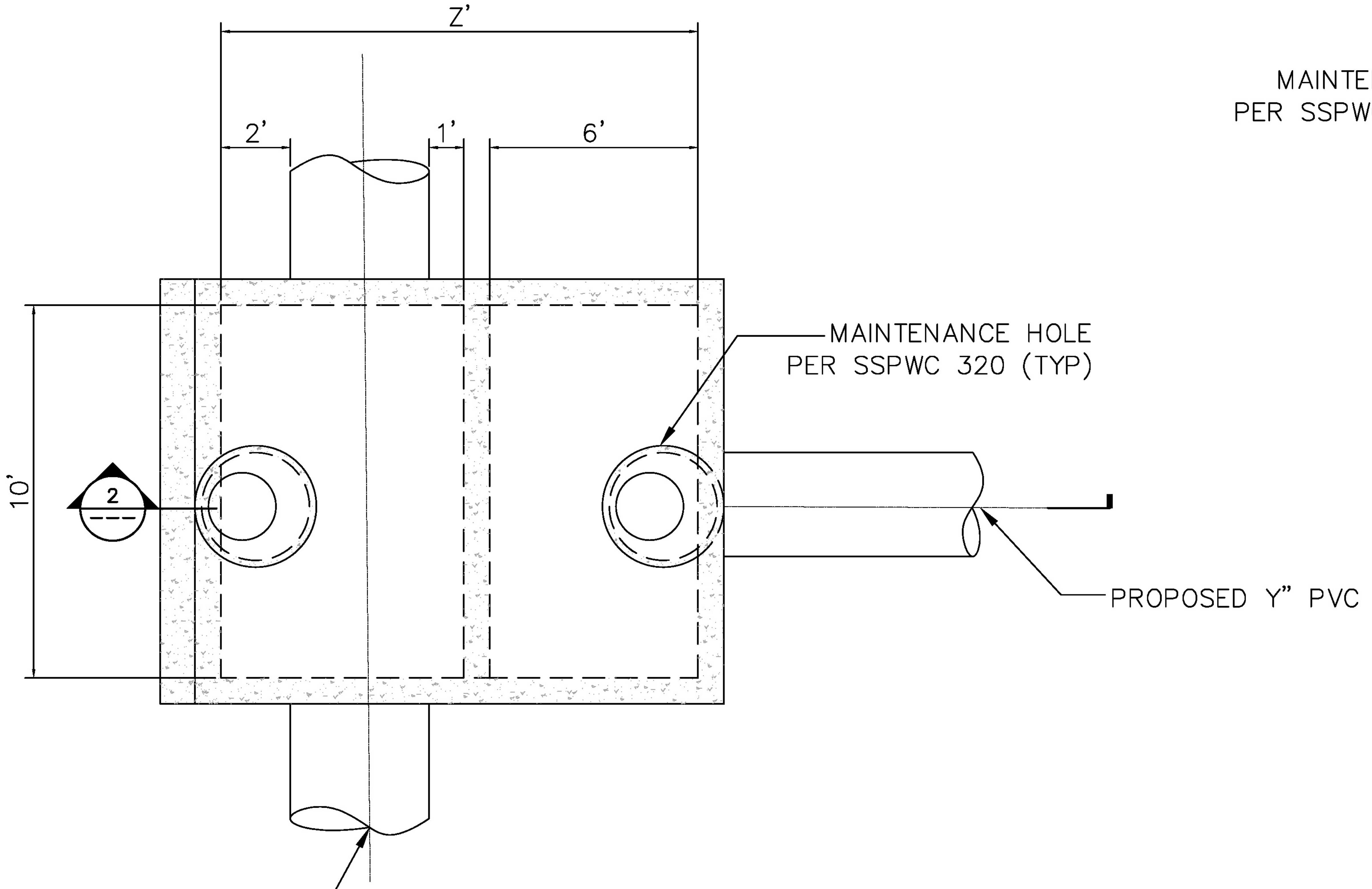
FOR
REVIEW
ONLY
NOT FOR
CONSTRUCTION

Metro

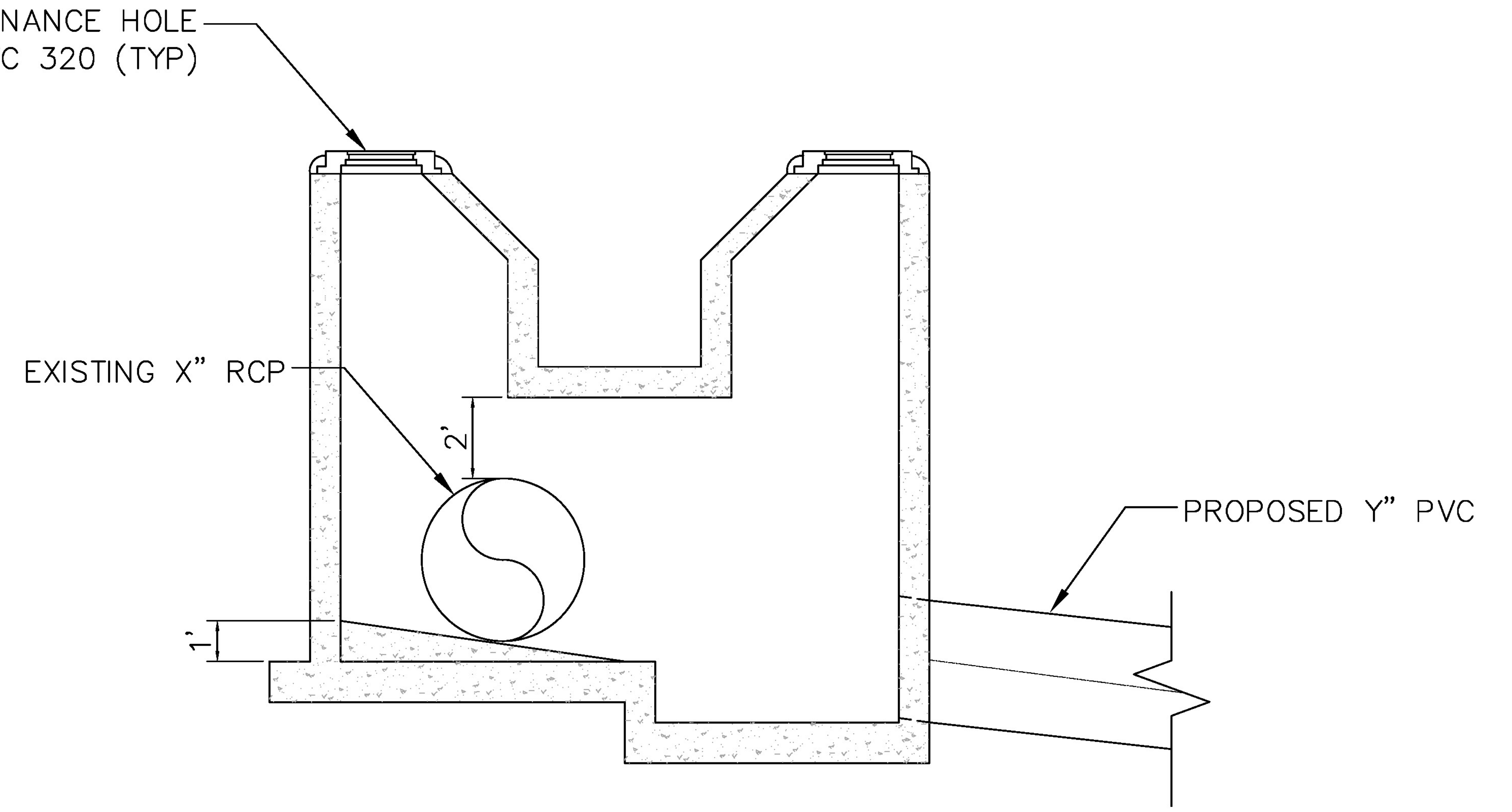
**LOS ANGELES COUNTY**
**METROPOLITAN TRANSPORTATION AUTHORITY**

METRO ORANGE LINE STORM WATER
CAPTURE AND RECHARGE
PRETREATMENT DETAIL

CONTRACT NO
XXXXX
DRAWING NO
REV
0
SCALE
NTS
SHEET NO
14 OF 18



2 – **PLAN**
NOT TO SCALE



2 – **SECTION**
NOT TO SCALE

| DRYWELL CLUSTER ID | INVERT ELEVATION OF STORM DRAIN PIPE | DIMENSIONS | | |
|---|---|---|---|---|
| | | X | Y | Z |
| MOL1 | 11.00' | 81 | 20 | 10.5 |
| MOL2 | 26.12' | 96 | 20 | 10.5 |
| MOL3 | 15.96' | 84 | 18 | 10.5 |
| MOL4 | 12.91' | 78 | 24 | 10.5 |
| MOL5 | 21.11' | 66 | 18 | 10.5 |
| MOL7 | 25.06' | 75 | 20 | 10.5 |

FOR SAFE CLEAN WATER
PROGRAM APPLICATION
NOT FOR CONSTRUCTION

THE PREPARATION OF THIS DRAWING HAS BEEN FINANCED IN PART THROUGH A GRANT FROM THE U.S. DEPARTMENT OF TRANSPORTATION, FEDERAL TRANSIT ADMINISTRATION (FTA), UNDER THE FEDERAL TRANSIT ACT OF 1964, AS AMENDED, AND IN PART BY THE TAXES OF THE CITIZENS OF LOS ANGELES COUNTY AND OF THE STATE OF CALIFORNIA.

| REV | DATE | BY | APP | REG. NO. | EXPIRES | SEAL HOLDER | DESCRIPTION |
|---|---|---|---|---|---|---|---|
| | | | | | | | |

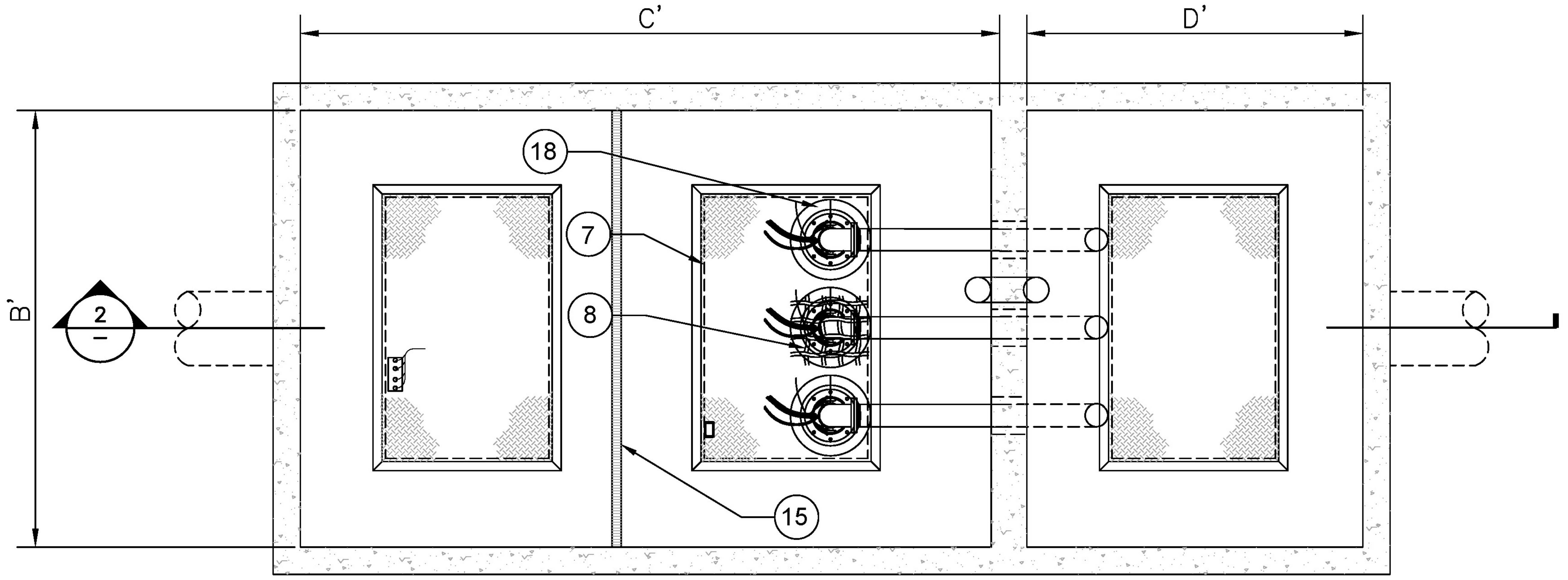
DESIGNED BY XXXXXXXX
DRAWN BY XXXXXXXX
CHECK BY XXXXXXXX
IN CHARGE XXXXXXXX
DATE XX/XX/XXXX

FOR
REVIEW
ONLY
NOT FOR
CONSTRUCTION

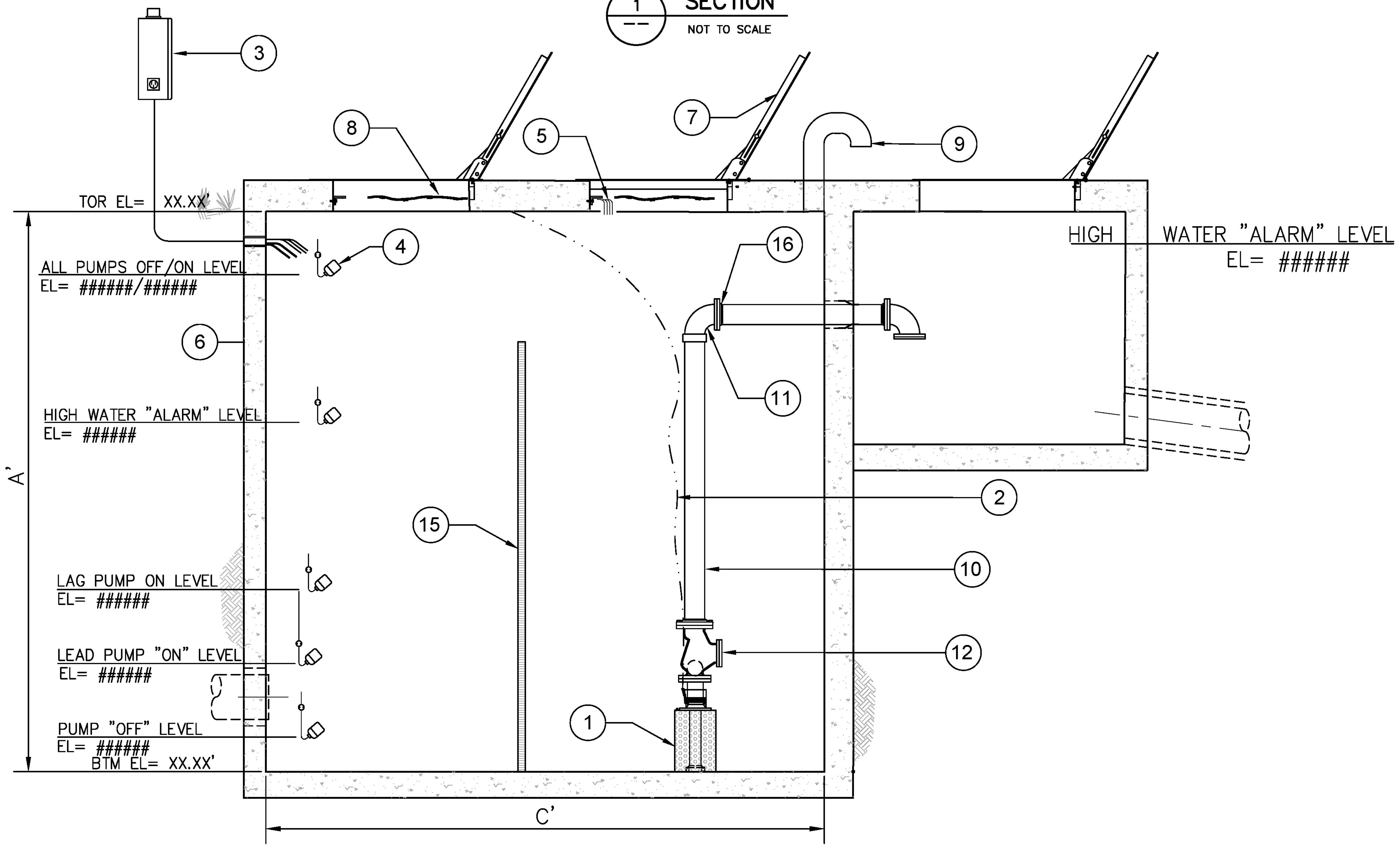
Metro
**LOS ANGELES COUNTY**
**METROPOLITAN TRANSPORTATION AUTHORITY**

METRO ORANGE LINE STORM WATER
CAPTURE AND RECHARGE
DIVISION STRUCTURE DETAILS

CONTRACT NO XXXXX
DRAWING NO
REV 0
SCALE NTS
SHEET NO 15 OF 18



① SECTION
NOT TO SCALE



Ⓐ SECTION
NOT TO SCALE

| KEYED NOTES | | |
|---|---|---|
| MARK | QTY | DESCRIPTION |
| 1 | 3 | SUBMERSIBLE AXIAL PUMP |
| 2 | 3 | LIFT-OUT CHAIN STAINLESS STEEL |
| 3 | 1 | NEMA 4X CONTROL PANEL W/ GENERATOR RECPTACLE (MOUNTED BY CONTRACTOR) |
| 4 | 5 | FLOAT SWITCH |
| 5 | 1 | CONTROL CABLE BRACKET |
| 6 | 1 | PRECAST CONCRETE WET WELL BASIN |
| 7 | 1 | XX"xXX" DOUBLE LEAF ALUMINUM HATCH w/ SS HINGES & SLAMLOCK (300 PSF) |
| 8 | 1 | SAFETY NET |
| 9 | 1 | X" VENT W/ INSECT SCREEN GALV STEEL CONSTRUCTION |
| 10 | 1 | X" DISCHARGE PIPE |
| 11 | 2 | X" ELBOW |
| 12 | 1 | X" BALL CHECK VALVE |
| 13 | 3 | 3" ELEC CPLG |
| 14 | – | REBAR AS REQ'D |
| 15 | 1 | TRASH SCREEN, 1/2" OPENING |
| 16 | 1 | ALL JOINTS MADE WATER-TIGHT W/ PLASTIC FLEXIBLE GASKET (RAM-NEK) |

SPECIFICATIONS

CONCRETE:

CLASS I/II CONCRETE WITH DESIGN STRENGTH OF 4500 PSI AT 28 DAYS. UNIT IS OF MONOLITHIC CONSTRUCTION AT FLOOR, FIRST STAGE OF WALL AND BAFFLE WITH SECTIONAL RISER TO REQUIRED DEPTH.

REINFORCEMENT:

GRADE 60 REINFORCED WITH STEEL REBAR CONFORMING TO ASTM A615 ON REQUIRED CENTERS OR EQUAL.

ALUMINUM HATCH:

300 PSF RATED, 1/4" ALUMINUM SKID-RESISTANT FLOOR PLATE, STAINLESS STEEL TAMPERPROOF BOLTING & HINGES & SLAMLOCK. (H-20 RATING OPTIONAL)

| PUMP No. | TYPE | GPM | TDH | RPM | ELECTRICAL | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | HP | V | PH | Hz |
| 1 | AXIAL | XXXX | XX' | XXXX | XX | XXX | X | XX |
| 1 | AXIAL | XXXX | XX' | XXXX | XX | XXX | X | XX |
| 1 | AXIAL | XXXX | XX' | XXXX | XX | XXX | X | XX |

CONTROLS:

PUMP CONTROLS SHALL BE MOUNTED INSIDE A UL LISTED NEMA-4X ENCLOSURE AND INCLUDE CIRCUIT BREAKERS, ALARM CIRCUIT FUSE, IEC RATED MOTOR STARTER, PUMP HOA, AND ALTERNATOR RELAY. PANEL SHALL HAVE A VISUAL ALARM BEACON. PANEL IS DESIGNED FOR REMOTE MOUNTING.

| STATION OPERATION LEVELS | | |
|---|---|---|
| RISING LEVEL CYCLE | | |
| WATER LEVEL ELEVATION | ACTION | PUMPS IN OPERATION |
| XX.XX' | LEAD PUMP TURNS "ON" | LEAD PUMP "ON" |
| XX.XX' | LAG PUMP TURNS "ON" | LEAD & LAG PUMPS "ON" |
| XX.XX' | HIGH WATER "ALARM" LEVEL | LEAD & LAG PUMPS "ON" HIGH LEVEL ALARM "ON" |
| XX.XX' | ALL PUMPS OFF/ON | LEAD & LAG PUMPS "OFF" |
| FALLING LEVEL CYCLE | | |
| WATER LEVEL ELEVATION | ACTION | PUMPS IN OPERATION |
| XX.XX' | PUMPS "OFF" LEVEL | ALL PUMPS "OFF" LAG PUMP SWITCHES TO LEAD PUMP |
| XX.XX' | ALL PUMPS OFF/ON | LEAD & LAG PUMPS "ON" |

*PUMPS TO ALTERNATE THRU ALL PUMPS ONLY 2 PUMPS RUN AT A TIME*

| DRYWELL CLUSTER ID | DIMENSION | | | | FLOW (GPM) | # OF PUMPS | INVERT OF INCOMING PIPE (FT) |
|---|---|---|---|---|---|---|---|
| | A | B | C | D | | | |
| MOL1 | 14 | 8 | 14.5 | 6 | 4,310 | 5 | 11 |
| MOL2 | 29.12 | 8 | 22 | 6 | 7,164 | 8 | 26 |
| MOL3 | 18.96 | 8 | 9.5 | 6 | 2,496 | 3 | 15.96 |
| MOL4 | 15.91 | 8 | 22 | 6 | 7,004 | 8 | 12.91 |
| MOL5 | 24.11 | 8 | 9.5 | 6 | 2,303 | 3 | 21.11 |
| MOL7 | 28.06 | 8 | 9.5 | 6 | 5,029 | 3 | 25.06 |

FOR SAFE CLEAN WATER
PROGRAM APPLICATION
NOT FOR CONSTRUCTION

THE PREPARATION OF THIS DRAWING HAS BEEN FINANCED IN PART THROUGH A GRANT FROM THE U.S. DEPARTMENT OF TRANSPORTATION, FEDERAL TRANSIT ADMINISTRATION (FTA), UNDER THE FEDERAL TRANSIT ACT OF 1964, AS AMENDED, AND IN PART BY THE TAXES OF THE CITIZENS OF LOS ANGELES COUNTY AND OF THE STATE OF CALIFORNIA.

| REV | DATE | BY | APP | REG. NO. | EXPIRES | SEAL HOLDER | DESCRIPTION |
|---|---|---|---|---|---|---|---|

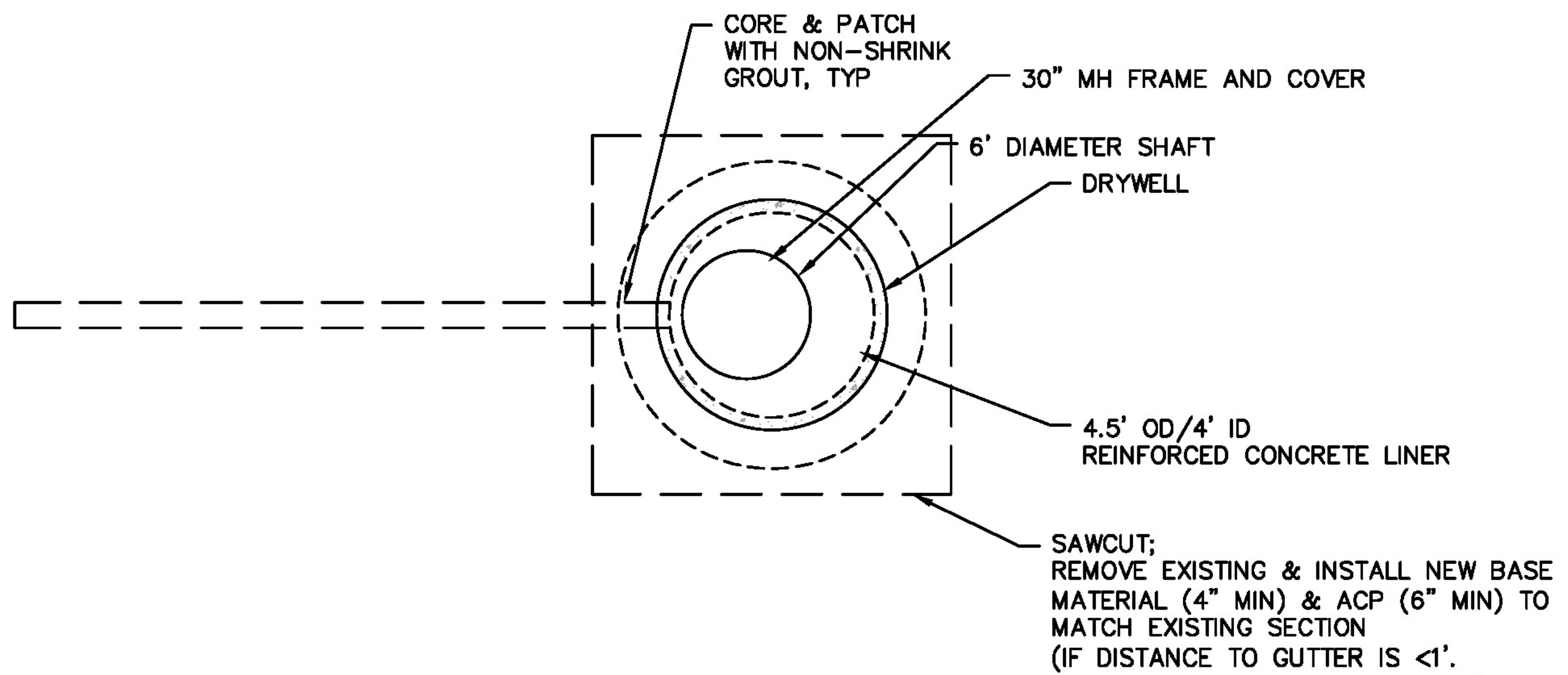
DESIGNED BY XXXXXXXX
DRAWN BY XXXXXXXX
CHECK BY XXXXXXXX
IN CHARGE XXXXXXXX
DATE XX/XX/XXXX

FOR
REVIEW
ONLY
NOT FOR
CONSTRUCTION

Metro
LOS ANGELES COUNTY
METROPOLITAN TRANSPORTATION AUTHORITY

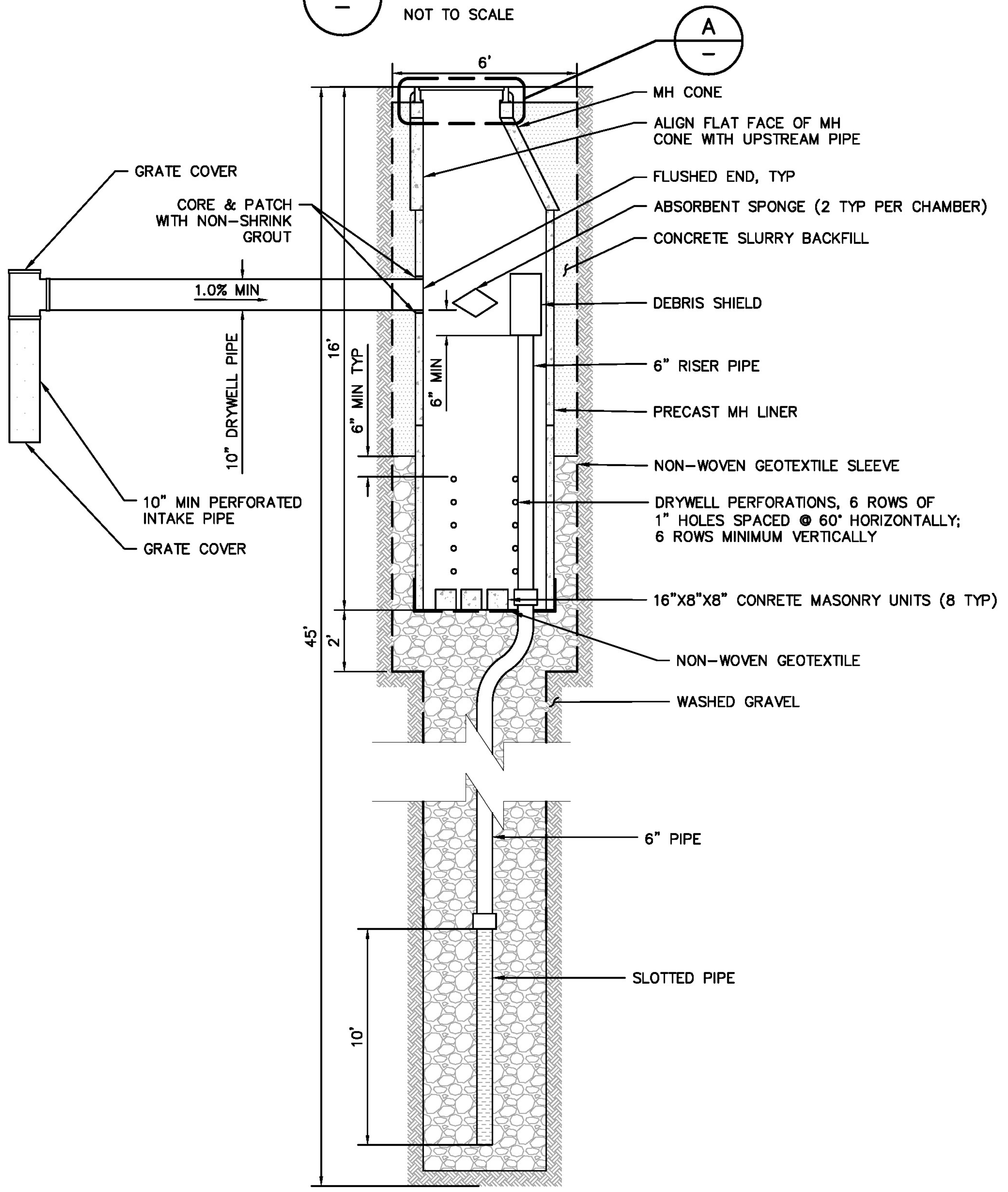
METRO ORANGE LINE STORM WATER
CAPTURE AND RECHARGE
PUMP STATION DETAIL

CONTRACT NO XXXXX
DRAWING NO XX-X-XXX
REV 0
SCALE NTS
SHEET NO 16 OF 18



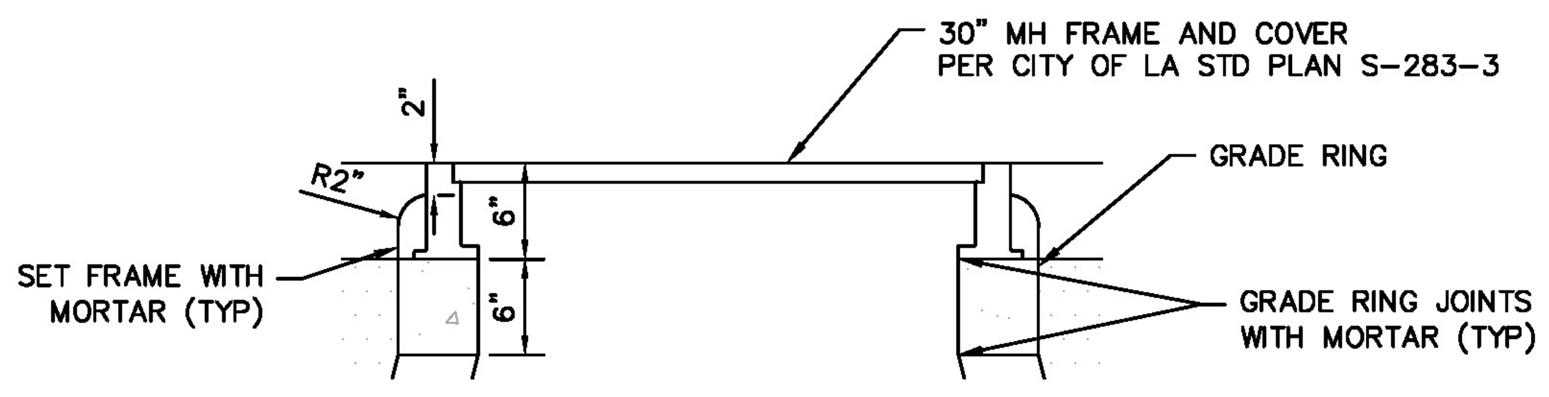
## 1 TYPICAL SECTION

NOT TO SCALE



## TYPICAL SECTION

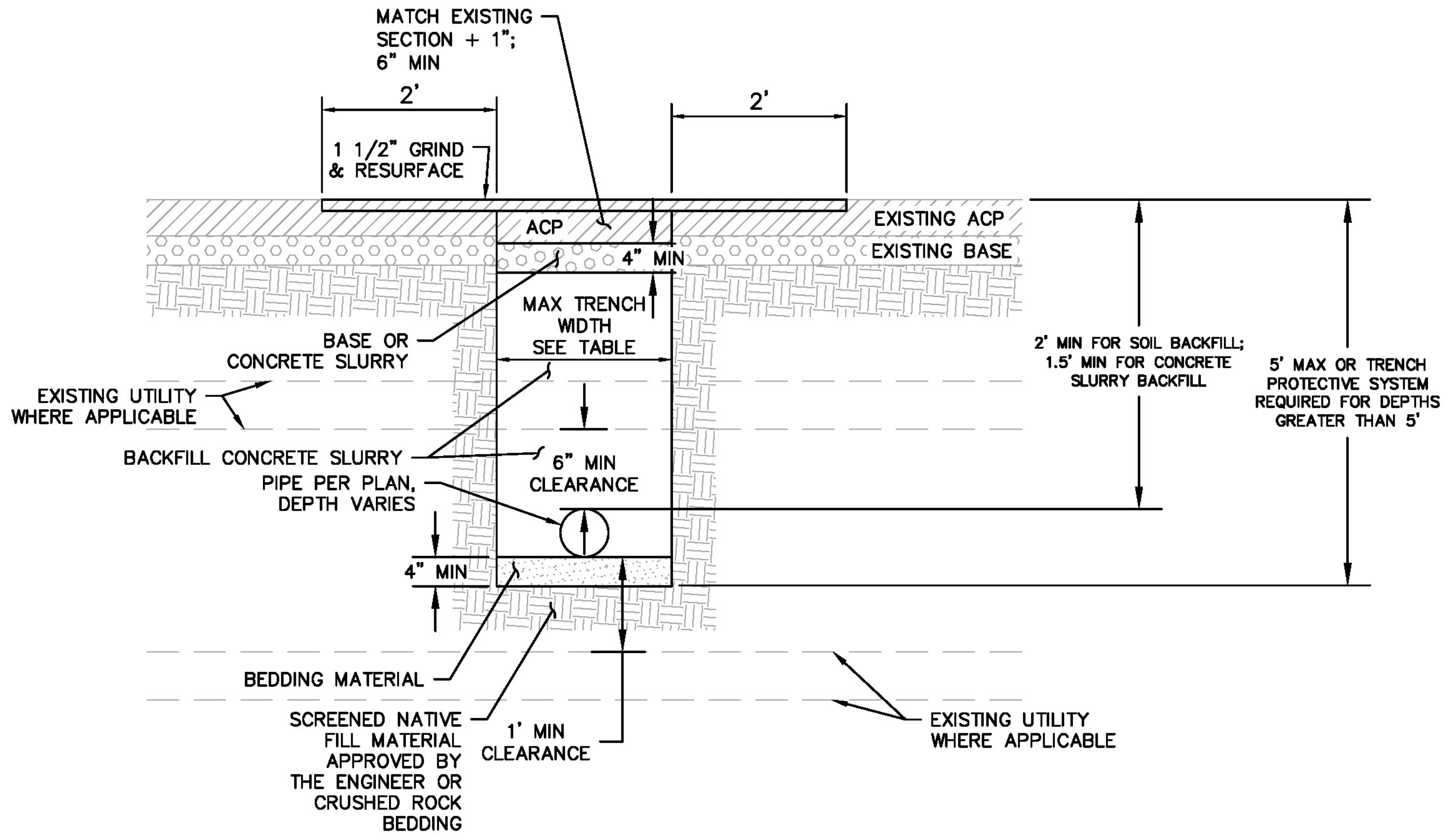
NOT TO SCALE



## A MH FRAME AND COVER DETAIL

NOT TO SCALE

| PIPE SIZE | MAX TRENCH WIDTH |
|---|---|
| 8" OR SMALLER | 24" |
| 10" OR 12" | 30" |
| 15" | 36" |
| 18" | 42" |



## B TYPICAL TRENCH DETAIL

NOT TO SCALE

FOR SAFE CLEAN WATER
PROGRAM APPLICATION
NOT FOR CONSTRUCTION

THE PREPARATION OF THIS DRAWING HAS BEEN FINANCED IN PART THROUGH A GRANT FROM THE U.S. DEPARTMENT OF TRANSPORTATION, FEDERAL TRANSIT ADMINISTRATION (FTA), UNDER THE FEDERAL TRANSIT ACT OF 1964, AS AMENDED, AND IN PART BY THE TAXES OF THE CITIZENS OF LOS ANGELES COUNTY AND OF THE STATE OF CALIFORNIA.

| REV | DATE | BY | APP | REG. NO. | EXPIRES | SEAL HOLDER | DESCRIPTION |
|---|---|---|---|---|---|---|---|

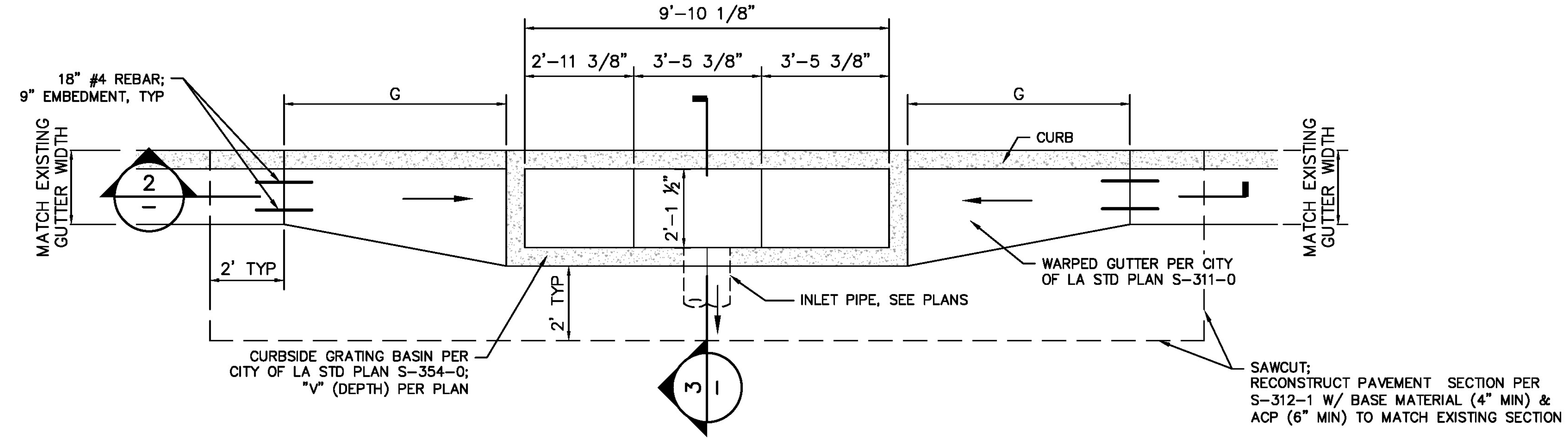
DESIGNED BY
XXXXXXXX
DRAWN BY
XXXXXXXX
CHECK BY
XXXXXXXX
IN CHARGE
XXXXXXXX
DATE
XX/XX/XXXX

FOR
REVIEW
ONLY
NOT FOR
CONSTRUCTION

Metro
**LOS ANGELES COUNTY
METROPOLITAN TRANSPORTATION AUTHORITY**

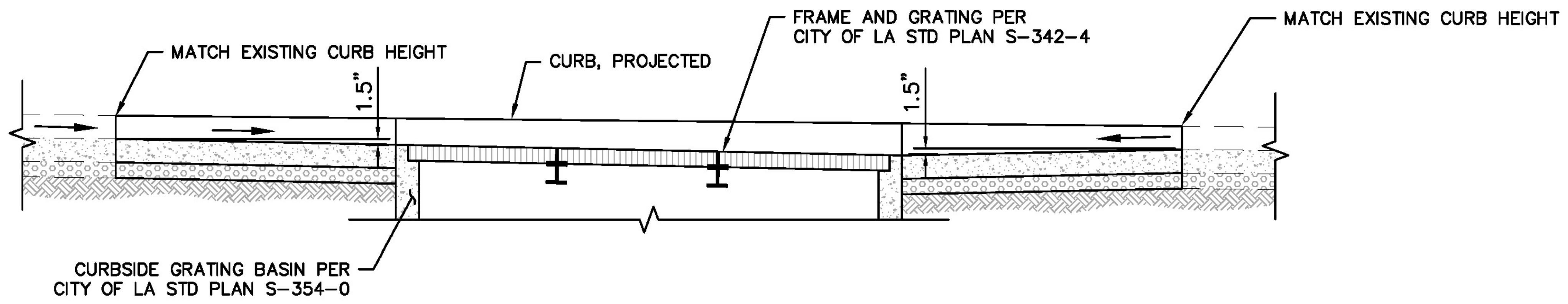
METRO ORANGE LINE STORM WATER
CAPTURE AND RECHARGE
DRYWELL & TRENCH DETAILS

CONTRACT NO
XXXXX
DRAWING NO
XX-X-XXX
REV
0
SCALE
NTS
SHEET NO
17 OF 18



1 — THREE GRATES CATCH BASIN PLAN VIEW

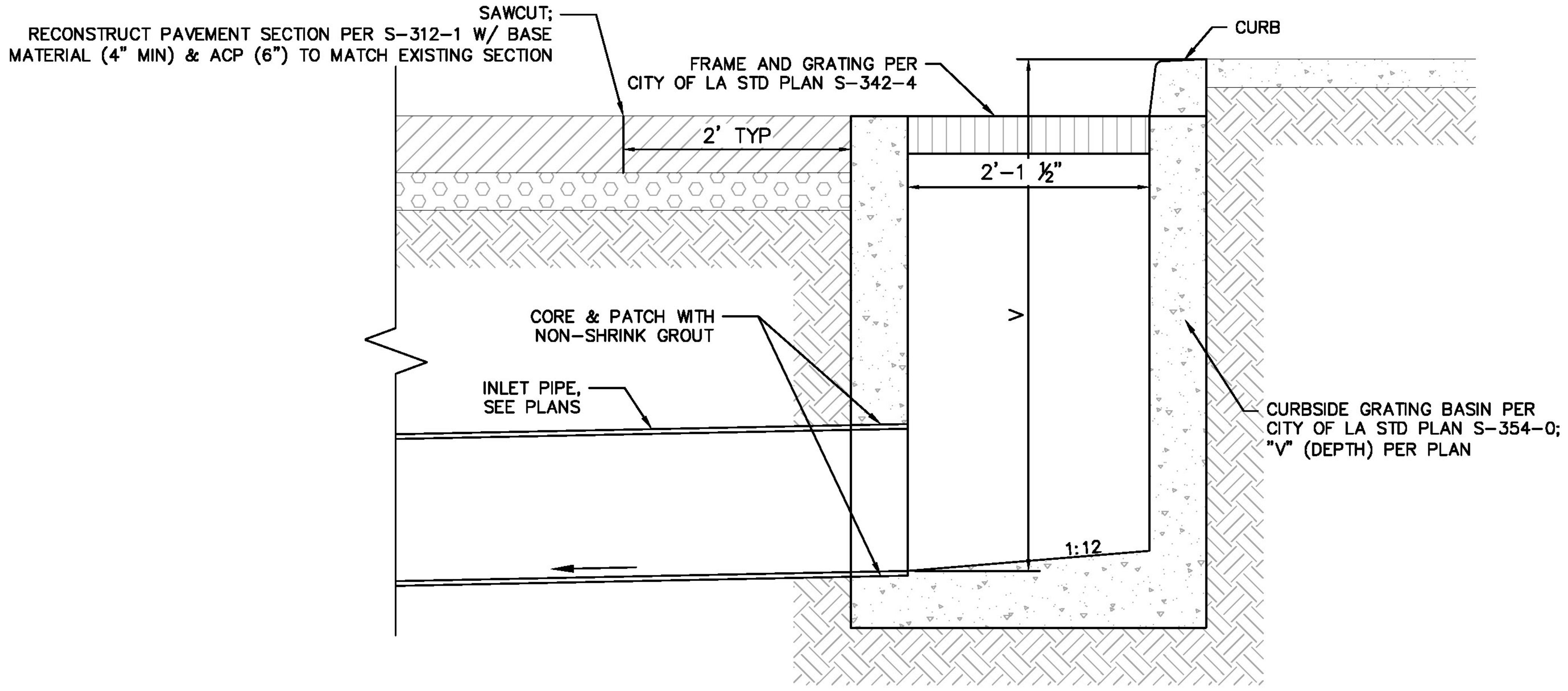
NOT TO SCALE



2 — THREE GRATES CATCH BASIN STREET PROFILE VIEW

NOT TO SCALE

NOTES:
1. G = 3' FOR EXISTING 2' GUTTER WIDTH; OR
G = 6' FOR EXISTING 1' GUTTER WIDTH



3 — CATCH BASIN PIPE PROFILE VIEW

NOT TO SCALE

FOR SAFE CLEAN WATER
PROGRAM APPLICATION
NOT FOR CONSTRUCTION

THE PREPARATION OF THIS DRAWING HAS BEEN FINANCED IN PART THROUGH A GRANT FROM THE U.S. DEPARTMENT OF TRANSPORTATION, FEDERAL TRANSIT ADMINISTRATION (FTA), UNDER THE FEDERAL TRANSIT ACT OF 1964, AS AMENDED, AND IN PART BY THE TAXES OF THE CITIZENS OF LOS ANGELES COUNTY AND OF THE STATE OF CALIFORNIA.

| REV | DATE | BY | APP | REG. NO. | EXPIRES | SEAL HOLDER | DESCRIPTION |
|---|---|---|---|---|---|---|---|
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |

DESIGNED BY XXXXXXXX
DRAWN BY XXXXXXXX
CHECK BY XXXXXXXX
IN CHARGE XXXXXXXX
DATE XX/XX/XXXX

FOR
REVIEW
ONLY
NOT FOR
CONSTRUCTION

Metro
LOS ANGELES COUNTY
METROPOLITAN TRANSPORTATION AUTHORITY

METRO ORANGE LINE STORM WATER
CAPTURE AND RECHARGE
CATCH BASIN DETAILS

CONTRACT NO XXXXX
DRAWING NO XX-X-XXX
REV 0
SCALE NTS
SHEET NO 18 OF 18

# ATTACHMENTS FOR SECTION 2.2:

## CAPTURE AREA

# Capture Area Delineation

## Metro Orange Line Water Infiltration and Quality Project

# 1. INTRODUCTION

As part of the Safe Clean Water Program Feasibility Study for the Metro Orange Line Water Quality and Infiltration Project ("Project"), this attachment documents the methodology and output of the capture area delineation process, which supports the quantified water quality and water supply benefits presented in the main report.

Given the nature of the proposed distributed infiltration BMPs, the Safe Clean Water project module's built-in modeling component cannot be utilized. Instead, the modeling work was performed using Los Angeles County's Watershed Management System 2.0 (WMMS 2.0).

For the WMMS 2.0 model, the baseline LSPC model was modified by editing the subwatershed boundary and hydrologic response unit (HRU) parameters to simulate dry and wet weather runoff from the Project drainage areas[1]. The hydrologic response unit (HRU) within the revised subwaterhsed boundary was updated accordingly using the HRU raster downloaded from WMMS 2.0 website.

# 2. DRAINAGE AREA

Project drainage area overlaps with the WMMS subwatersheds 6839, 6844, 6850, 6856, 6859 and 6861. The Project drainage area imperviousness used the HRU raster obtained from WMMS 2.0 data repository[2]. It should be noted the WMMS 2.0 HRU categorization is defined in a finer resolution than the land use categorization used in the SCW Project Module. In absence of official grouping guidance, the WMMS 2.0 HRU was grouped into SCW Project Module land use classes as presented in Table 1. The HRU breakdown within the full Project drainage area is depicted in Figure 1.

**Table 1. Breakdown of Impervious Acreage in Capture Area**

| **SCW Project Module Land Use Class** | **WMMS 2.0 HRU** | **Acreage (ac)** | | | **Percent of Total Impervious Area** |
|---|---|---|---|---|---|
| | | **Pervious** | **Impervious** | **Total** | |
| Commercial | Dev_Com | 0 | 122 | 122 | 8.3% |
| Industrial | Dev_Ind | 0 | 54 | 54 | 3.7% |
| Institutional | Dev_Inst | 0 | 108 | 108 | 7.3% |
| | Dev_Roof | 0 | 656 | 656 | 44.5% |
| *Institutional Subtotal* | | *0* | *764* | *764* | *51.9%* |
| Multi Family Residential | Dev_ResHigh | 0 | 82 | 82 | 5.6% |
| Secondary Roads and Alleys | Road_Primary | 0 | 98 | 98 | 6.7% |
| | Road_Minor | 0 | 189 | 189 | 12.8% |
| *Secondary Roads and Alleys Subtotal* | | 0 | 287 | 287 | 19.5% |

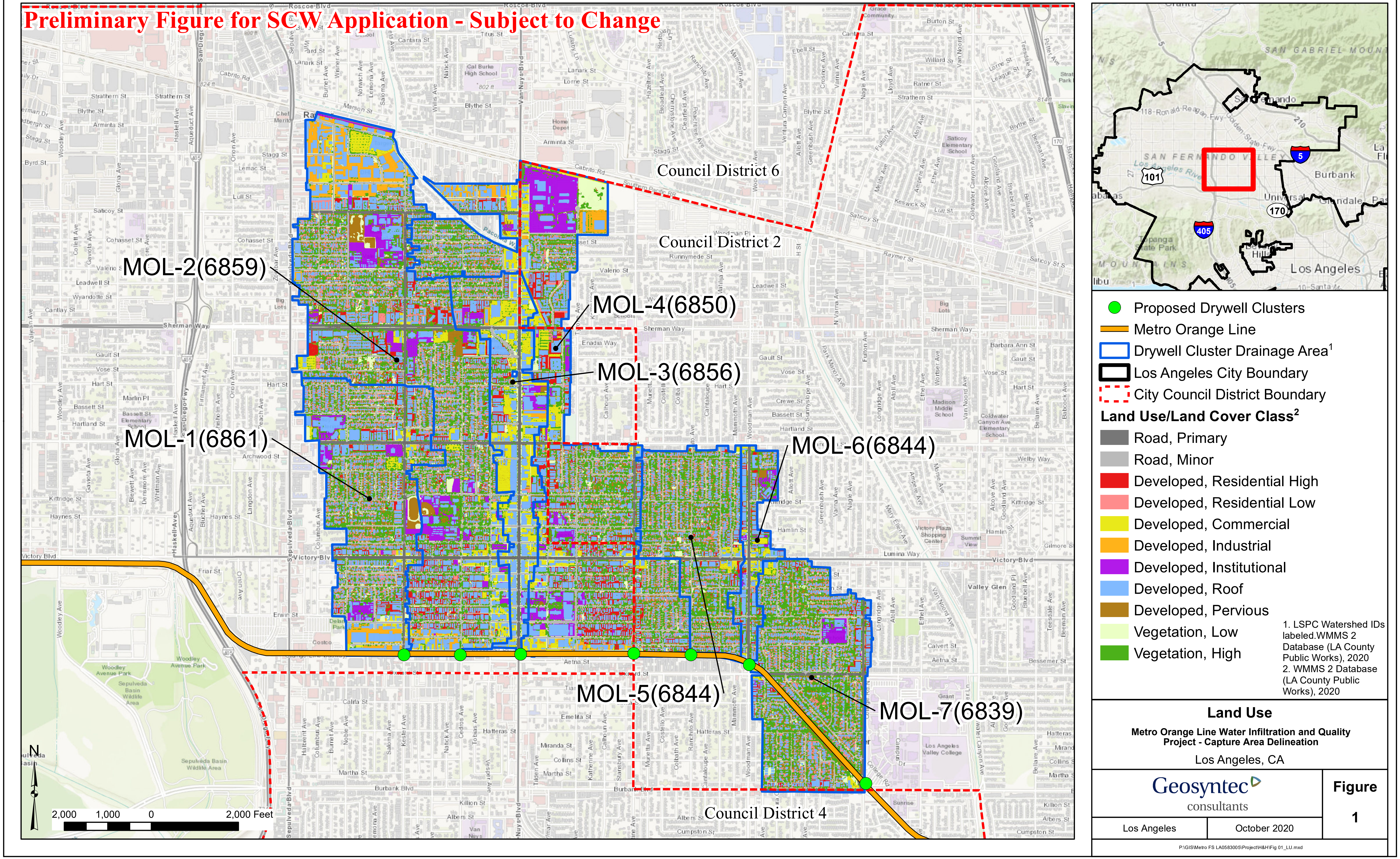
---

[1] Model input was developed and executed using LSPC v6.0 provided in the WMMS 2.0 application package

[2] https://portal.safecleanwaterla.org/wmms/downloads

| **SCW Project Module Land Use Class** | **WMMS 2.0 HRU** | **Acreage (ac)** | | | **Percent of Total Impervious Area** |
|---|---|---|---|---|---|
| | | **Pervious** | **Impervious** | **Total** | |
| Single Family Residential | Dev_ResLow | 0 | 149 | 149 | 10.1% |
| Urban Open Space | Dev_Irrigated | 59 | 0 | 59 | n/a |
| | Dev_Overspray | 0 | 14 | 14 | 0.9% |
| | Dev_Pervious | 166 | 0 | 166 | n/a |
| *Urban Open Space Subtotal* | | *225* | *14* | *239* | *0.9%* |
| Vacant | Veg_High | 494 | 0 | 494 | n/a |
| | Veg_Low | 127 | 0 | 127 | n/a |
| *Vacant Subtotal* | | *621* | *0* | *621* | *0%* |
| **Grand Total** | | **846** | **1,473** | **2,319** | **100%** |

# FIGURE



1. LSPC Watershed IDs labeled.WMMS 2 Database (LA County Public Works), 2020
2. WMMS 2 Database (LA County Public Works), 2020

**Land Use**

**Metro Orange Line Water Infiltration and Quality Project - Capture Area Delineation**

Los Angeles, CA

Geosyntec
consultants

**Figure**

**1**

| | |
|---|---|
| Los Angeles | October 2020 |

P:\GIS\Metro FS LA0583005\Project\H&H\Fig 01_LU.mxd

# ATTACHMENTS FOR SECTION 2.4:

# SITE CONDITIONS & CONSTRAINTS

Geosyntec
consultants
engineers | scientists | innovators

Metro

# Geotechnical Review

## Metro Orange Line Water Infiltration and Quality Project

# 1 INTRODUCTION

The Metro Orange Line Water Infiltration and Quality Project (Project) proposes to design and implement infiltration best management practices (BMPs) within Los Angeles County Metropolitan Transportation Authority (LA Metro) parcels and right-of-way (ROW) in the San Fernando Valley area of City of Los Angeles. The purpose of the Project is to capture and infiltrate stormwater runoff, to improve downstream water quality, help recharge the groundwater basin, and mitigate localized nuisance flooding in disadvantaged communities and neighborhoods with significant unmet needs within the neighboring geographical area. Drywells and associated pretreatment facilities are the primary type of infiltration BMPs proposed for this Project. To support the Project’s Safe Clean Water Program application, data from both recent subsurface investigations and publicly available desktop information were used to evaluate constraint to assesses the feasibility and potential geotechnical constraints. Summary of findings are provided in this attachment.

# 2 SITE CONDITION

## 2.1 Surface Condition

The existing site consists of parking lots, paved roads, and vegetated parkways along Metro Orange Line ROW between Kester Avenue and Fulton Avenue. The area drains to the south (Figure 1) with a slight gradient and an approximate average elevation of 760 ft. USGS topographic data show slopes of less than five percent throughout the Project site. According to the Los Angeles Department of Building and Safety (LADBS) Guidelines for Stormwater Infiltration (LADBS, 2017), stormwater infiltration facilities must be placed at locations with a gradient less than 20 percent (5:1 horizontal to vertical). Therefore, the proposed infiltration BMPs are not anticipated to contribute to slope instability.

## 2.2 Subsurface Soils and Hydraulic Conductivity

Subsurface soil properties and hydraulic conductivity were characterized and estimated based on a comprehensive review of the following geologic, topographic, and geotechnical information:

1. NRCS Hydrologic Soil Groups (Figure 2);
2. Los Angeles County Soil Classes (Figure 3);
3. Regional Geologic Map (Figure 4)[1];
4. Available boring logs and cone penetration test (CPT) results collected as part of the MOL BRT Improvement Project (Appendix A). Locations of reviewed CPT and boring logs are shown in Figure 5;

---

[1] Figure obtained from MOL BRT Improvement Project 30% Geotechnical Memo (Wood, 2020)

5. Available boring logs nearby the Project provided by drywell vendors (Appendix B); and
6. CPT results collected by Geosyntec Consultants at Victory Green Stormwater Infrastructure Project, which is a nearby stormwater capture project that also relies on drywells as the primary BMP type (Appendix C). Locations of reviewed CPT and boring logs are shown in Figure 5;

As shown in Figure 2 through 4, the Project site overlaps geologic unit QyF (Young alluvial fan deposits). The soils throughout the Project site are classified as Hydrologic Soil Groups A and B, and Los Angeles County Soil Class Number 5, 8, and 15, which are associated with silty sand, sandy loam, and silt loam. Hydraulic conductivity was developed from the selected CPT and boring log information based on published correlations between CPT data and soil descriptions and hydraulic conductivity. The average and standard deviation of hydraulic conductivity between 16 and 50 ft below ground surface (bgs) from all reviewed sites was used to compute the design hydraulic conductivity. Summaries of hydraulic conductivity for Project site are shown on Figure 6. As shown in the figure, the average and standard deviation of bulk hydraulic conductivities between 16 and 50 ft bgs is 7.6E-04 ft/sec and 4.01E-04 ft/sec, respectively.

Drywell infiltration rates were computed based on the average hydraulic conductivity using the United States Bureau of Reclamation (USGR) equation[2]. Other data sources in the area were considered to help validate these drywell infiltration rate estimates. A reasonable safety factor was applied such that the drywell infiltration rate is calculated based on the previously computed average hydraulic conductivity minus 1 standard deviation (7.6E-04 ft/sec – 4.0E-04 ft/sec = 3.6E-04 ft/sec). The resultant drywell infiltration capacity is 0.8 cfs. The detailed calculation procedure can be found in Appendix D.

## 2.3 Groundwater

The Project is above the San Fernando Valley Groundwater Basin (SFVGB), which is an unconfined groundwater aquifer in the Upper Los Angeles River (ULAR) Watershed Area. According to the Los Angeles Department of Water and Power (LADWP), SFVGB is of concern to local municipal agencies due to its recent decline in groundwater level, which is assumed to be heavily influenced by urbanization, causing runoff to leave the basin rather than infiltrating (ULAR WMG, 2020). SFVGB has four existing beneficial uses outlined in the Regional Water Quality Control Board Basin Plan for Los Angeles County, which include: municipal and domestic supply, industrial service supply, industrial process supply, and agricultural supply (2014).

Concerning depth to groundwater, the historically highest groundwater contours from the Van Nuys, Burbank, San Fernando, and Sunland Quadrangles (California Department of Mines and Geology, Plate 1.2, 1997, 1998) were examined; see Appendix F for Plate 1.2. The historically highest groundwater contours at the proposed drywell locations range from 15 to 100 ft bgs.

---

[2] For more information on the formula and applicability of USBR formula please see https://www.usbr.gov/tsc/techreferences/mands/mands-pdfs/DrainMan.pdf

Information obtained or deduced from more recent borings (2019 and 2020), however, indicate groundwater table depths that are well in excess of 15 ft bgs near the southern drywell clusters shown on Plate 1.2. To demonstrate this, Plate 1.2 was overlain with more recent borehole data; see Figure 5. As shown in the figure, boring logs within or immediately adjacent to the Project site show groundwater depth of at least 70 feet bgs according to data collected since 2019. The proposed depth of the drywells is 45 ft. Therefore, the bottom of the proposed drywell is more than 10 ft above the top of the groundwater table, consistent with the LADBS Guidelines for Stormwater Infiltration (LADBS, 2017). This indicates that the existing conditions are suitable for drywell installation. Reviewed boring logs for groundwater depth investigation are included in Appendix G.

## 2.4 Geophysical Category

The City of Los Angeles analyzed geophysical characteristics in the LADWP Stormwater Capture Master Plan (SCMP) for the purpose of implementing stormwater BMPs throughout the City of Los Angeles. The analysis defined areas within the City of Los Angeles as geophysical category A, B, or C. Categories were determined based on a combination of infiltration obstacles, such as susceptibility to landslides, depth to groundwater, slope, hydrologic soil group, geology, aquifer, and liquefaction potential.

The proposed drywells are within geophysical category A, as shown in Figure 7.

Geophysical category A is defined in the SCMP as “areas [that] have no obstacles to infiltration, infiltrative soils, pervious geology, and overlie the highest priority aquifers. They are very conducive to infiltration BMPs” (City of LA DWP, 2013). Therefore, the proposed BMPs are not anticipated to encounter any geophysical obstacles to infiltration.

# 3 GEOLOGIC HAZARDS

According to the LADBS Guidelines for Stormwater Infiltration, the feasibility of the proposed Project was evaluated for consideration of potential liquefaction and seismic settlement, surcharge on adjacent structures, and soil expansiveness (LADBS, 2017). These hazards were assessed using data from local geotechnical borings, site-specific geotechnical investigations, and publicly available information on geologic hazard zones. Findings are presented in the following sections.

## 3.1 Liquefaction and Seismic Settlement

Important seismic considerations in Southern California include surface rupture along faults, ground shaking, landslide potential, and liquefaction. A review of the United States Geological Survey (USGS) Quaternary Faults indicates that the risk of surface rupture impacting the Project is low. The highest risk is ground shaking, although as drywells are relatively light, subsurface, and are not load-bearing, the probability of catastrophic failure is low.

The Project site is relatively flat with an approximate average elevation of 760 ft. As shown in Figure 8, the proposed infiltration BMPs are not located in identified area that pose risk of potential landslide.

As shown in Figure 8, a fraction of the proposed infiltration BMPs are located within a mapped Liquefaction Zone. Liquefaction is a condition where high excess pore water pressure develops in partially or fully saturated soil (generally loose, saturated, and cohesionless soils) as a result of earthquake loading. When the shear stress required for the equilibrium of a soil mass is greater than the shear strength of the soil in its liquefied state, the soil loses a large portion of its shear resistance, as the effective stress of the soil goes to zero, causing a liquid-like response.

Research on historical and recent groundwater depth are summarized in Figure 5. Although reported historical high groundwater elevations in the Project site area are between approximately 15 and 20 feet bgs, more recent data indicate that the top of the groundwater table beneath the site is typically more than 77 ft bgs. Since the drywells will be 45-feet deep, a minimum 32-ft separation between the bottom of the well and the top of the groundwater table would be present. As a result, water infiltrated through the proposed drywells is not anticipated to significantly raise the groundwater elevation, and a separation of more than 10 feet between the bottom of the drywells and the groundwater table is expected. On this basis, the proposed drywells are not expected to significantly increase the risk of liquefaction to the adjacent existing improvements. In addition, the proposed drywells are relatively lightweight and are not critical facilities, therefore, although liquefaction may cause some damage to the drywells it would not lead to a safety concern to the public.

The proposed drywells and associated pretreatment facilities are relatively lightweight and therefore significant static settlement is not anticipated. Seismic settlement can occur with or without liquefaction; it results from densification of loose soils. However, because of the lightweight nature of the drywells and lack of shallow groundwater, the potential for significant seismic settlement at the site is considered low. According to the site-specific analysis conducted as part of the Metro Orange Line Improvement geotechnical investigation (see Appendix F), the total and differential liquefaction-induced settlements are less than 1 inch and 0.5 inches respectively. These values are less than the allowable total and differential liquefaction-induced settlement of 1.5 inches and 0.75 inches, respectively, according to the LADBS Guidelines for Stormwater Infiltration (LADBS, 2017).

## 3.2 Surcharge on Adjacent Structures

Proposed drywells and associated pretreatment facilities are not anticipated to place an increased surcharge on adjacent structures or foundations. Due to the relatively flat slopes, soil retaining structure are not known to be located near the proposed infiltration BMPs, therefore any potential increase in pore water pressure should not be a concern.

The proposed drywells will be located at least 10 feet from adjacent buildings to comply with the LADBS Guidelines for Stormwater Infiltration (LADBS, 2017).

## 3.3 Expansive Soil

Soils beneath the site are generally poorly graded sands and gravels with occasional thinly bedded silts and clays. Therefore, expansive soils are not anticipated to impact the proposed improvements. If expansive soils are encountered during grading or construction, the geotechnical engineer of the team will provide additional recommendations as appropriate.

# 4 POTENTIAL GROUNDWATER CONTAMINATION

Based on review of the Geotracker database and EDR report, there are active remediation efforts on volatile organic compounds and non-petroleum hydrocarbons within 0.5 miles of the proposed BMP sites. No significant contaminant plume was identified beneath the proposed BMP sites. Therefore, the risk of the proposed BMP introducing additional contaminants into the San Fernando Valley Groundwater Basin is low.

A comprehensive review of Geotracker and EDR reports can be found in Appendix H.

# 5 SUMMARY OF FINDINGS

The subsurface conditions of the proposed Project site are conducive to infiltration BMPs since the underlying soils are predominantly sandy in nature, generally classified as either Hydrologic Soil Group A or B, have substantial depth to groundwater, have favorable infiltration rates, and mitigated risk to liquefaction. Therefore, this review of geotechnical conditions indicates that implementation of the proposed infiltration BMPs is feasible throughout the Project area.

# 6 REFERENCES

California Geological Survey. 2020. Earthquake Zones of Required Investigation. Retrieved May 18, 2020. https://maps.conservation.ca.gov/cgs/EQZApp/app/

City of Los Angeles Department of Water and Power. 2013. Safe, Clean Water Program. Obtained May 2020.

Geosyntec. 2020. Green Stormwater Infrastructure Project Drilling Log and Percolation Test.

Los Angeles Department of Building and Safety. 2017. Guidelines For Storm Water Infiltration. https://ladbs.org/docs/default-source/publications/information-bulletins/building-code/guidelines-for-stormwater-infiltration-ib-p-bc2014-118.pdf?sfvrsn=13

Torrent Resources. 2019. Torrent Resources Drilling Log and Percolation Test. Received April 2020.

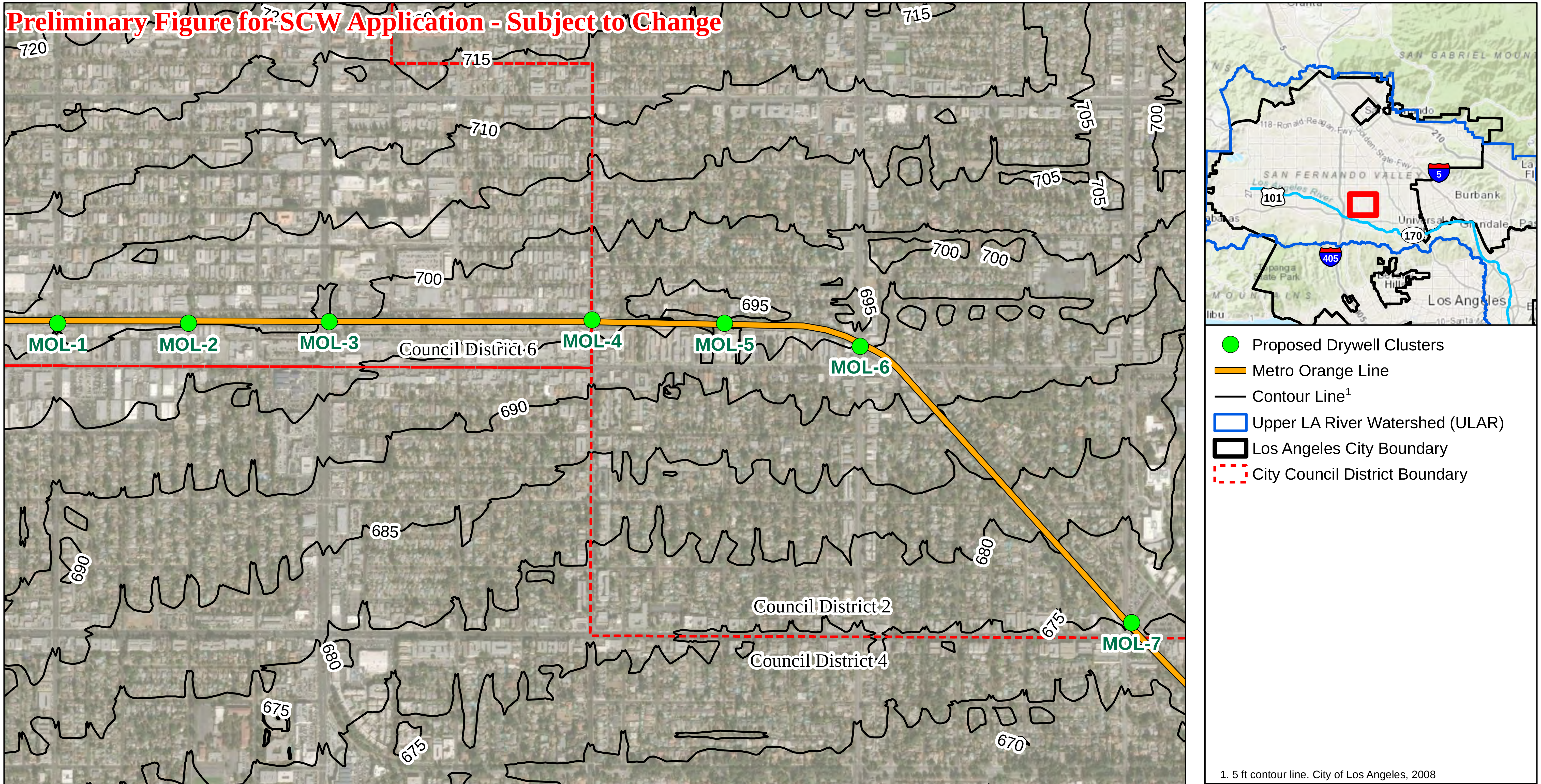
United States Geological Survey. 2020. U.S. Quaternary Faults- USGS Geologic Hazards Science Center Golden Co. Data Obtained May 13, 2020.

https://usgs.maps.arcgis.com/apps/webappviewer/index.html?id=5a6038b3a1684561a9b0aadf88412fcf

United States Geological Survey. 2020. Van Nuys Quadrangle - Plate 1.2 Historically High Groundwater Contour and Borehole Location s, Van Nuys 7.5- Minute Quadrangle, California. Obtained May 14, 2020.

Wood, 2020. Metro Orange Line Improvement Sepulveda Station and Grade Separation – 30% Geotechnical Design Memorandum, September.

# FIGURES



1. 5 ft contour line. City of Los Angeles, 2008

**Project Surface Condition**

**Metro Orange Line Water Infiltration and Quality Project - Geotechnical Review**

Los Angeles, CA

Geosyntec consultants

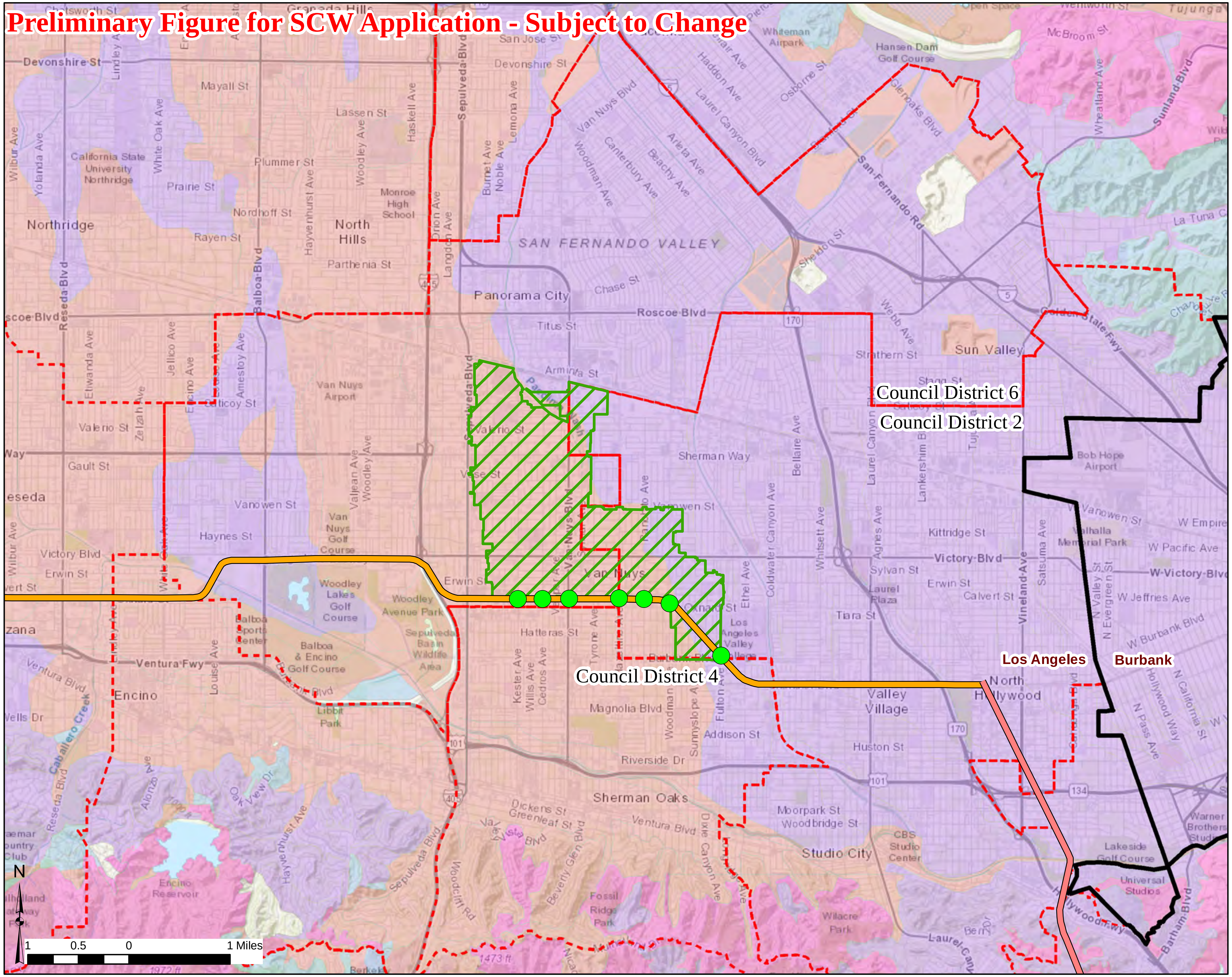
**Figure**

**1**

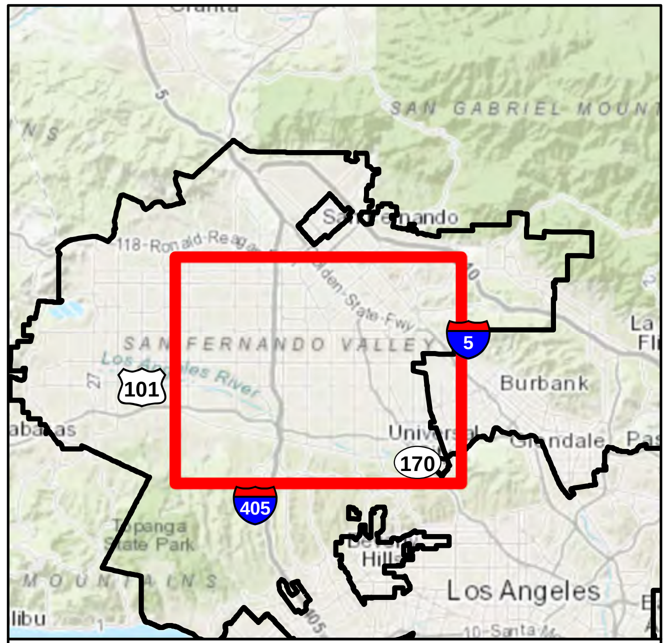
Los Angeles

October 2020

P:\GIS\Metro FS LA0583005\Project\Geotech\Fig 01_Catchment.mxd



Preliminary Figure for SCW Application - Subject to Change



**Legend**

- ● Proposed Drywell Clusters
- ▬ Metro Orange Line
- ▬ Metro Red Line
- ▨ Metro Stormwater Drainage Area
- ☐ Los Angeles City Boundary
- ⬚ City Council District Boundary

**HSG**[1]

| | |
|---|---|
| 🟪 | A |
| 🟥 | B |
| 🟦 | C |
| 🟪 | D |

1. NRCS, 2018

## USGS Hydrologic Soil Group (HSG)

Metro Orange Line Water Infiltration and Quality Project - Geotechnical Review

Los Angeles, CA

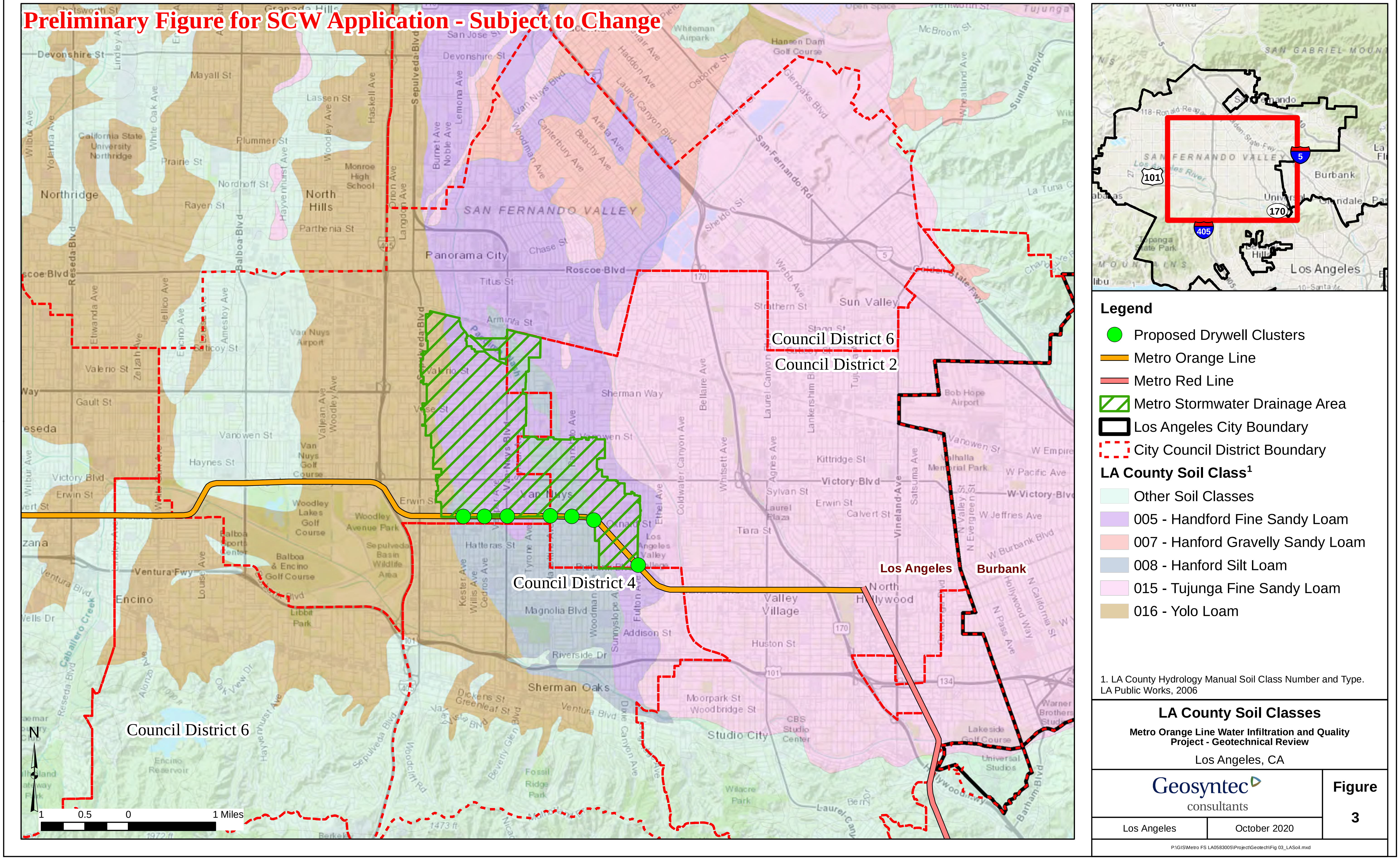
Geosyntec consultants

Los Angeles

October 2020

Figure 2

P:\GIS\Metro FS LA0583005\Project\Geotech\Fig 02_HSG.mxd



## LA County Soil Classes

Metro Orange Line Water Infiltration and Quality Project - Geotechnical Review

Los Angeles, CA

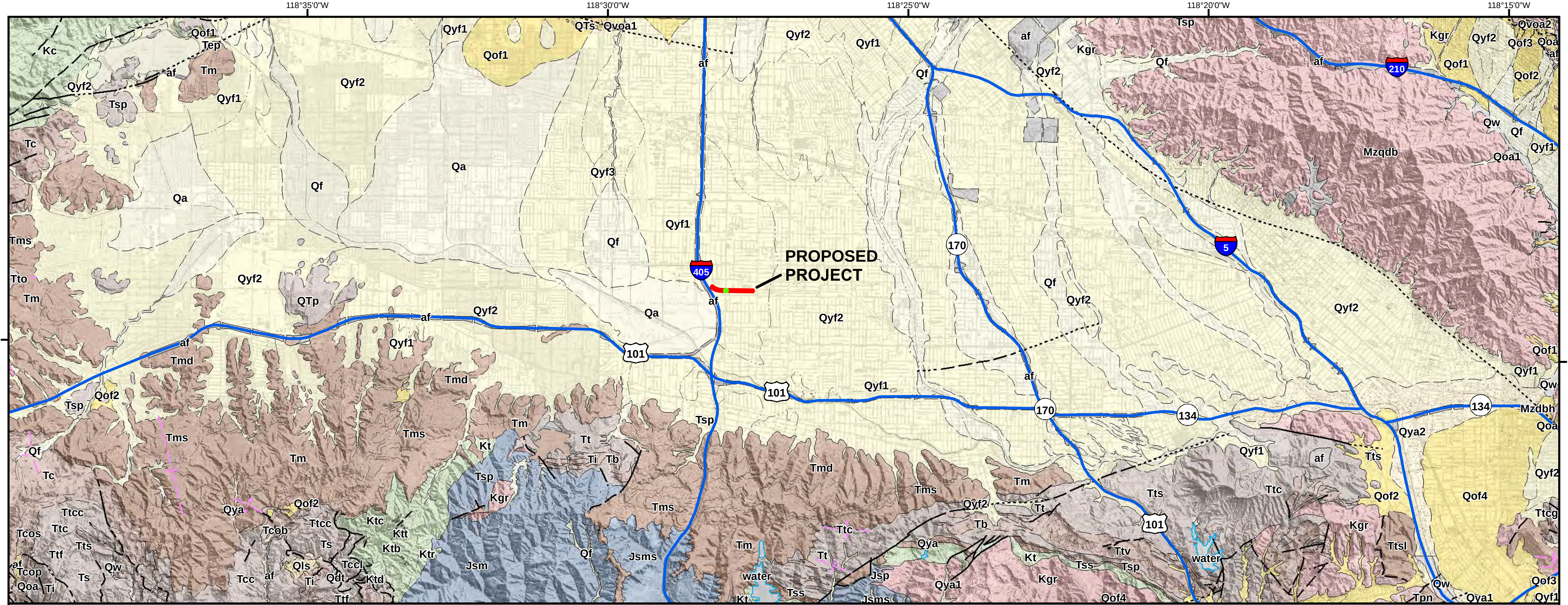
Geosyntec consultants

Figure 3

Los Angeles

October 2020

P:\GIS\Metro FS LA0583005\Project\Geotech\Fig 03_LASoil.mxd



**Geologic Units**

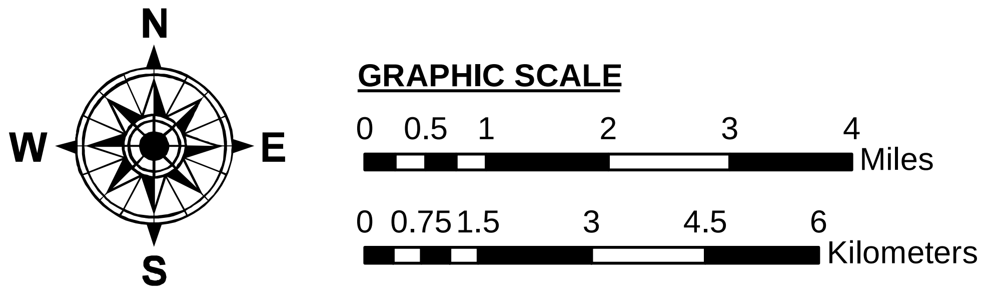
af - Artificial fill (latest Holocene)
pa - Ponded alluvium, fanglomerate and lacustrine deposits (latest Holocene)
Qa - Alluvium, undifferentiated, active channel (late Holocene)
Qw - Wash deposits (late Holocene)
Qf - Alluvial fan deposits (late Holocene, Holocene)
Qyf3,Qyf2, Qyf1 - Young alluvial fan deposits (Holocene to late Pleistocene)
Qyf - Young alluvial fan deposits, undivided (Holocene to late Pleistocene)
Qls - Landslide deposits (Holocene, late Pleistocene)
Qya - Young alluvium, undivided (Holocene to late Pleistocene)
Qya2 - Young alluvium, unit 2 (late Pleistocene)
Qya1 - Young alluvium, unit 1 (late Pleistocene)
Qof4, Qof3 - Old alluvial fan deposits, unit 4 (late Pleistocene)
Qof2 - Old alluvial fan deposits, unit 2 (late Pleistocene)
Qof1 - Old alluvial fan deposits, unit 1 (middle Pleistocene)
Qoa - Old alluvium, undivided (late to middle Pleistocene)
Qoa1 - Old alluvium, unit 1 (middle Pleistocene)
Qvoa2 - Very old alluvium, unit 2 (early Pleistocene)
Qvoa1 - Very old alluvium, unit 1 (early Pleistocene)
QTs - Saugus Formation, undivided (early Pleistocene, late Pliocene)
QTp - Pico Formation, undivided (Pliocene)
Tto - Towsley Formation, sandstone/claystone (late Miocene and early Pliocene)
Tpn - Puente FM, undiv., siltstone, sandstone, shale (early Pliocene/late Miocene)
Tm - Modelo Formation, undivided, mudstone, siltstone, shale (late Miocene)
Tms - Modelo Formation, siltstone, shale, clay shale (late Miocene)
Tmd - Modelo Formation, diatomaceous shale (late Miocene)
Tpss - Puente Formation, sandstone (late Miocene)
Ti - Intrusive rocks, undivided (middle Miocene)
Tc - Conejo Volcanics, undifferentiated (middle Miocene)
Tcop - Conejo Volcanics, basaltic lower zone, pillow basalt (middle Miocene)
Tcob - Conejo Volcanics, basaltic lower, basalt/andesitic basalt (middle Miocene)
Tt - Topanga Group, undivided, sedimentary and volcanic rocks (middle Miocene)
Ttsl - Topanga Canyon Formation, siltstone, sandstone and siliceous shale (middle Miocene)
Ttcg - Topanga Group, conglomerate (middle Miocene)
Tts - Topanga Canyon Formation, Saddle Peak Member, sandstone and conglomerate (middle and early Miocene)
Ttv - Topanga Canyon Formation, interbedded andesite and basalt flows (middle and early Miocene)
Ttcc - Topanga Canyon Formation, Cold Creek Member, sandstone, siltstone (early middle Miocene)
Ttf - Topanga Canyon FM, Fernwood Member, paralic-fluvial, estuarine, marine sandstone (early middle Miocene)
Ttc - Topanga Canyon Formation, undivided, sandstone with interbedded siltstone (early middle Miocene)
Tb - Basalt dikes, flows and breccias (Miocene)
Tsp - Sespe Formation, Piuma Member, sandstone (early Miocene to late Eocene)
Ts - Sespe Formation, undivided, conglomerate, sandstone (late Eocene, Oligocene, early Miocene)
Tccl - Coal Canyon Formation, algal limestone (Eocene and Paleocene)
Tcc - Coal Canyon Formation, sandstone, conglomerate, siltstone (Eocene and Paleocene)
Tep - Sedimentary Rocks of Chatsworth Reservoir (Eocene and/or Paleocene)
Tcos - Conejo Volcanics, Solstice Canyon tongue, basaltic and andesitic flow breccia, tuff (middle Miocene)
Tss - Santa Susana Formation, clay and mudrock (early to late Paleocene)
Kc - Chatsworth Formation, sandstone (late Cretaceous)
Ktc - Tuna Canyon Formation, pebble conglomerate (late Cretaceous)
Ktd - Tuna Canyon FM, fine-grained fossiliferous sandstone (late Cretaceous)
Ktb - Tuna Canyon Formation, sandstone (late Cretaceous)
Ktr - Trabuco Formation, conglomerate (late Cretaceous)
Kt - Tuna Canyon FM, marine sandstone/siltstone/conglomerate (late Cretaceous)
Ktt - Tuna Canyon Formation, marine sandstone (late Cretaceous)
Kgr - Granitic rocks (late Cretaceous)
Mzhd - Granitic rocks (late Cretaceous)
Jsm - Santa Monica Slate (late Jurassic)
Jsp - Santa Monica Slate, phyllite (late Jurassic)
Jsms - Santa Monica Slate, spotted (late Jurassic)
Mzg - Granitic complex (Mesozoic)
Mzqdb - Biotite-quartz diorite (Mesozoic)
Mzdbh - Biotite-hornblende diorite (Mesozoic)

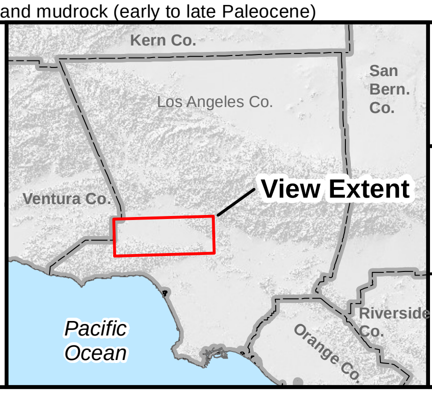
**Geologic Contacts**

——— contact, identity and existence certain, location accurate
— — contact, identity and existence certain, location approximate
········ contact, identity and existence certain, location concealed
– – – contact, identity and existence certain, location inferred

——— fault, identity and existence certain, location accurate
— — fault, identity and existence certain, location approximate
········ fault, identity and existence certain, location concealed
– – – fault, identity and existence certain, location inferred

(Queried where contacts are questionable)





References:
Bedrossian, T.L., Roffers, P., Hayhurst, C.A., 2012, "Geologic Compilation of Quaternary Surficial Deposits in Southern California", California Geological Survey, vector spatial data, Special Report 217, December 2012.

wood.

Wood
Environment & Infrastructure
Solutions, Inc.
6001 Rickenbacker Road
Los Angeles, California 90040
T: 323.889.5300 F: 323.721.6700

Proposed Sepulveda Grade Separation
Metro Orange Line Improvements
Los Angeles, California

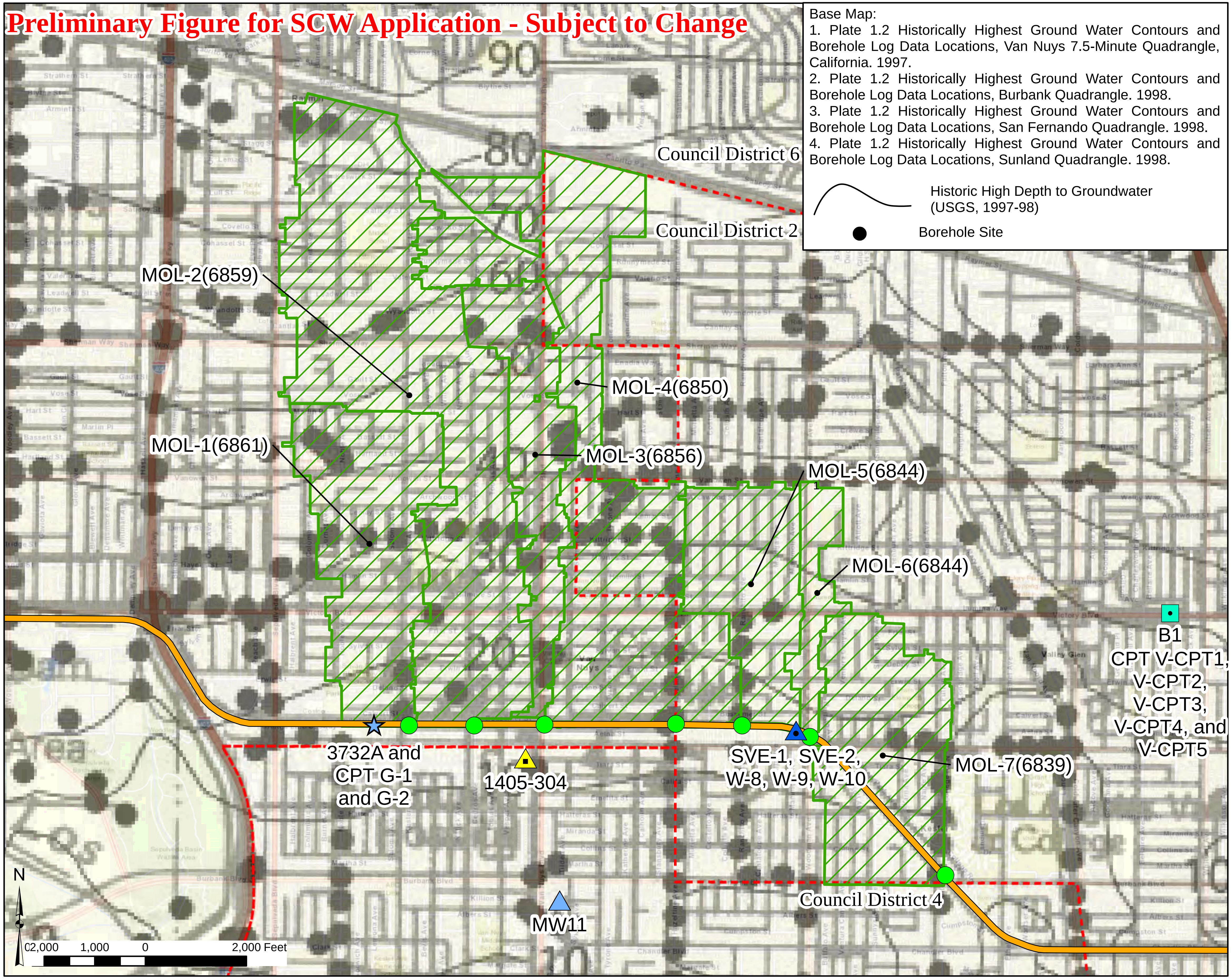
| | |
|---|---|
| LAT:<br>LON: | 34.1803<br>-118.4663 |
| SCALE: | 1:100,000 |
| DRAWN: | KSH |
| CHECK: | RM |
| DATE: | 8/21/2020 |

REGIONAL GEOLOGIC MAP

FIGURE:
*4*

PROJECT:
4953-18-0121

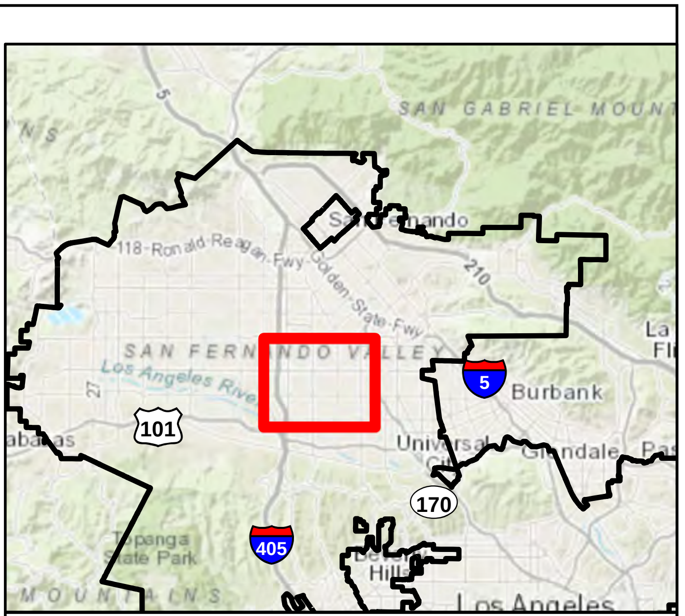
Path: G:\4953 Geotech\2018\180121 Metro Orange Line\GIS\4953180121 Figure 2 Regional Geologic Map rev03.mxd



Base Map:
1. Plate 1.2 Historically Highest Ground Water Contours and Borehole Log Data Locations, Van Nuys 7.5-Minute Quadrangle, California. 1997.
2. Plate 1.2 Historically Highest Ground Water Contours and Borehole Log Data Locations, Burbank Quadrangle. 1998.
3. Plate 1.2 Historically Highest Ground Water Contours and Borehole Log Data Locations, San Fernando Quadrangle. 1998.
4. Plate 1.2 Historically Highest Ground Water Contours and Borehole Log Data Locations, Sunland Quadrangle. 1998.

Historic High Depth to Groundwater (USGS, 1997-98)

● Borehole Site



- ● Proposed Drywell Clusters
- ▬ Metro Orange Line
- ▨ Metro Stormwater Drainage Area
- ☐ Los Angeles City Boundary
- ⬚ Council District Boundary

**Borehole Depth (ft)**
**No Groundwater Observed**
**(Torrent Resources, 2019)**

- ▲ 35
- ▲ >170

**Borehole Depth (ft)**
**No Groundwater Observed**
**(Geosyntec, 2020)**

- ■ 51.5

**Depth to Groundwater (ft)**
**(Torrent Resources, 2019)**

- △ 77

**Depth to Groundwater (ft)**
**(Metro Resources, 2020)**

- ★ 77 - 80

## Boring Logs and Depth to Groundwater

**Metro Orange Line Water Infiltration and Quality Project - Geotechnical Review**

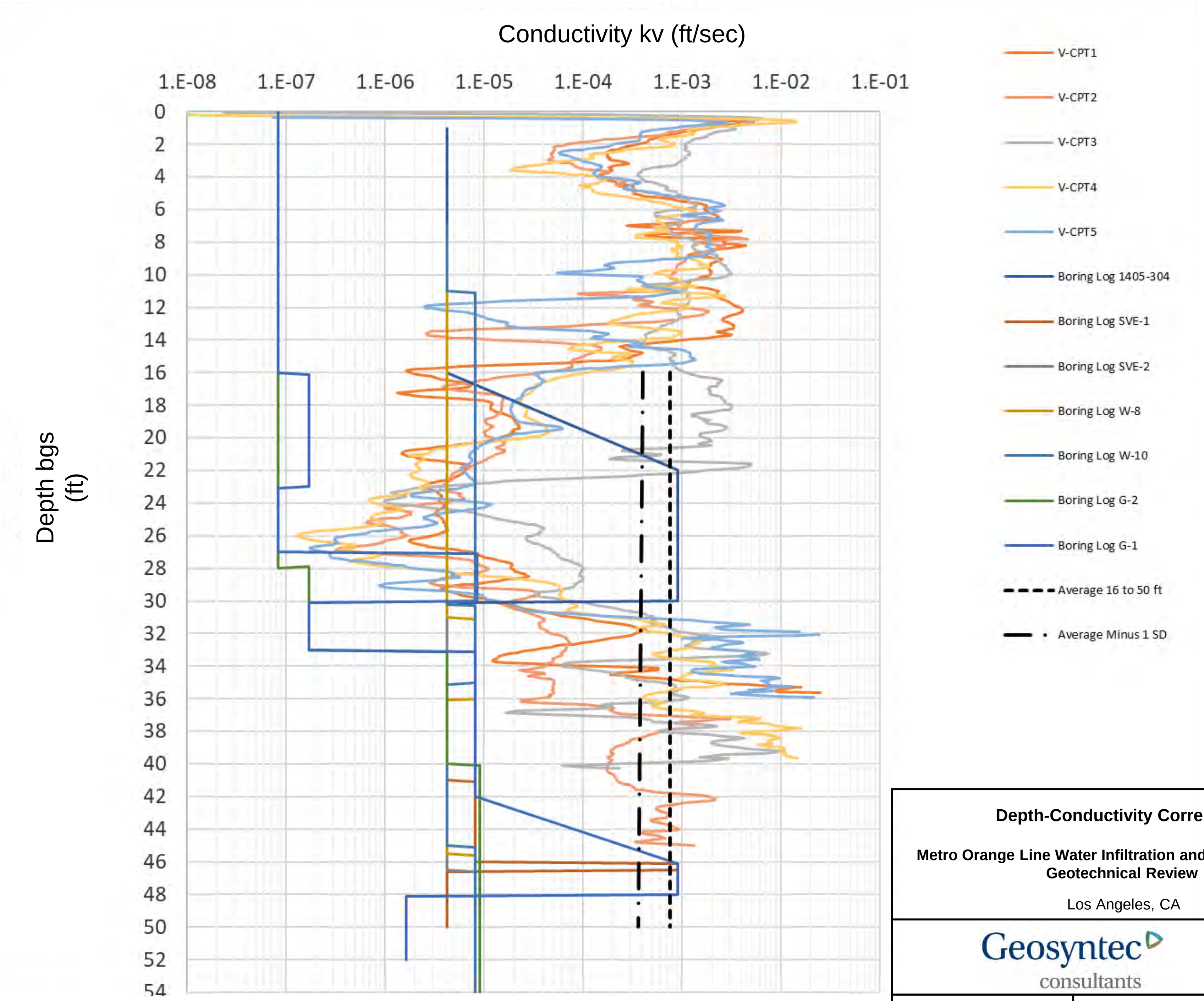
Los Angeles, CA

Geosyntec
consultants

Los Angeles | October 2020

Figure
5

P:\GIS\Metro FS LA0583005\Project\Geotech\Fig 07_Depth_GW(WIP).mxd



**Depth-Conductivity Correlation**

**Metro Orange Line Water Infiltration and Quality Project - Geotechnical Review**

Los Angeles, CA

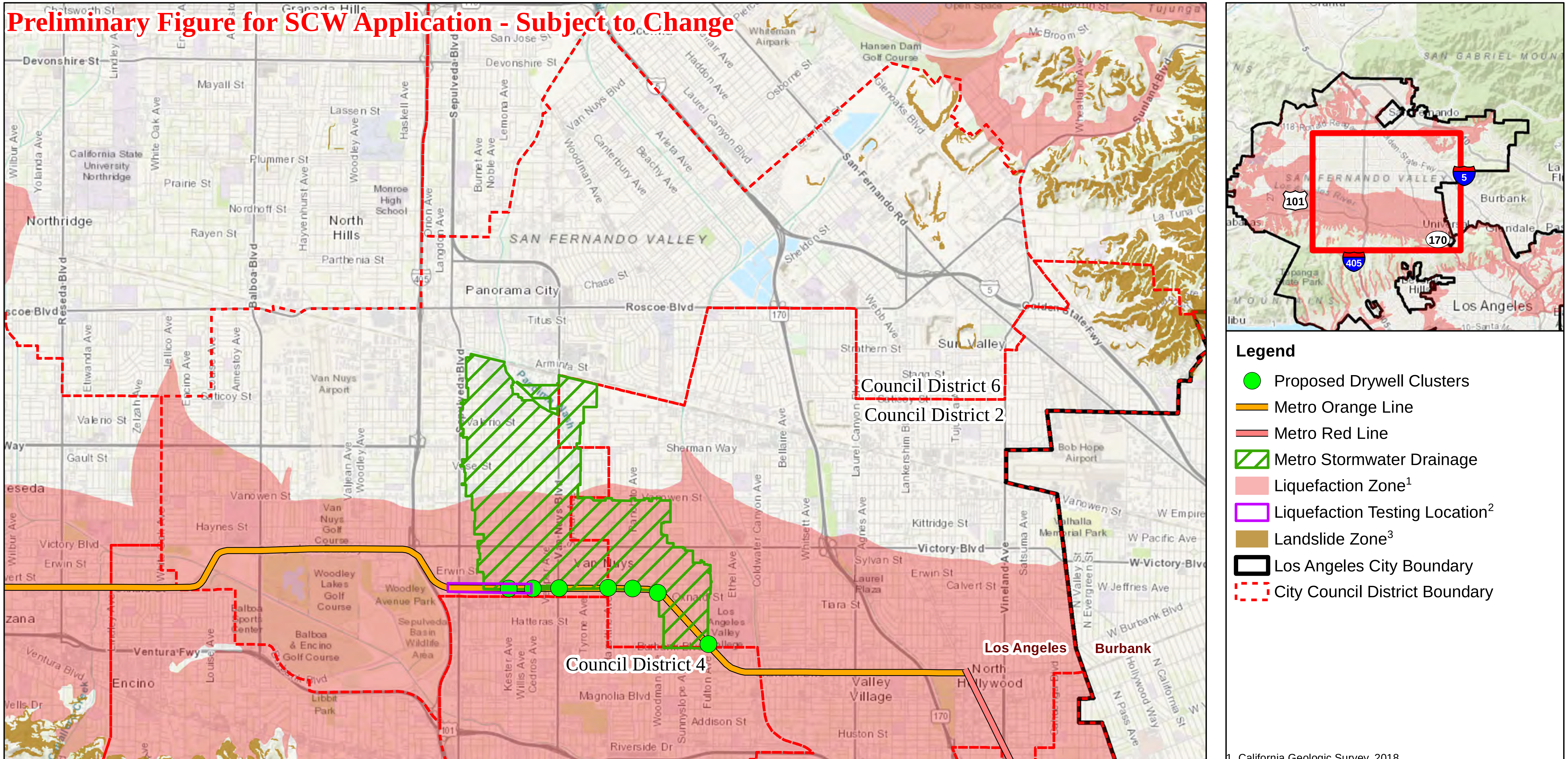
Geosyntec consultants

**Figure**

**6**

Los Angeles

October 2020



1. California Geologic Survey, 2018
2. Metro Orange Line Improvement geotechnical investigation, 2020
3. City of Los Angeles Hub, 2018

## Geologic Hazards

**Metro Orange Line Water Infiltration and Quality Project - Geotechnical Review**

Los Angeles, CA

Geosyntec consultants

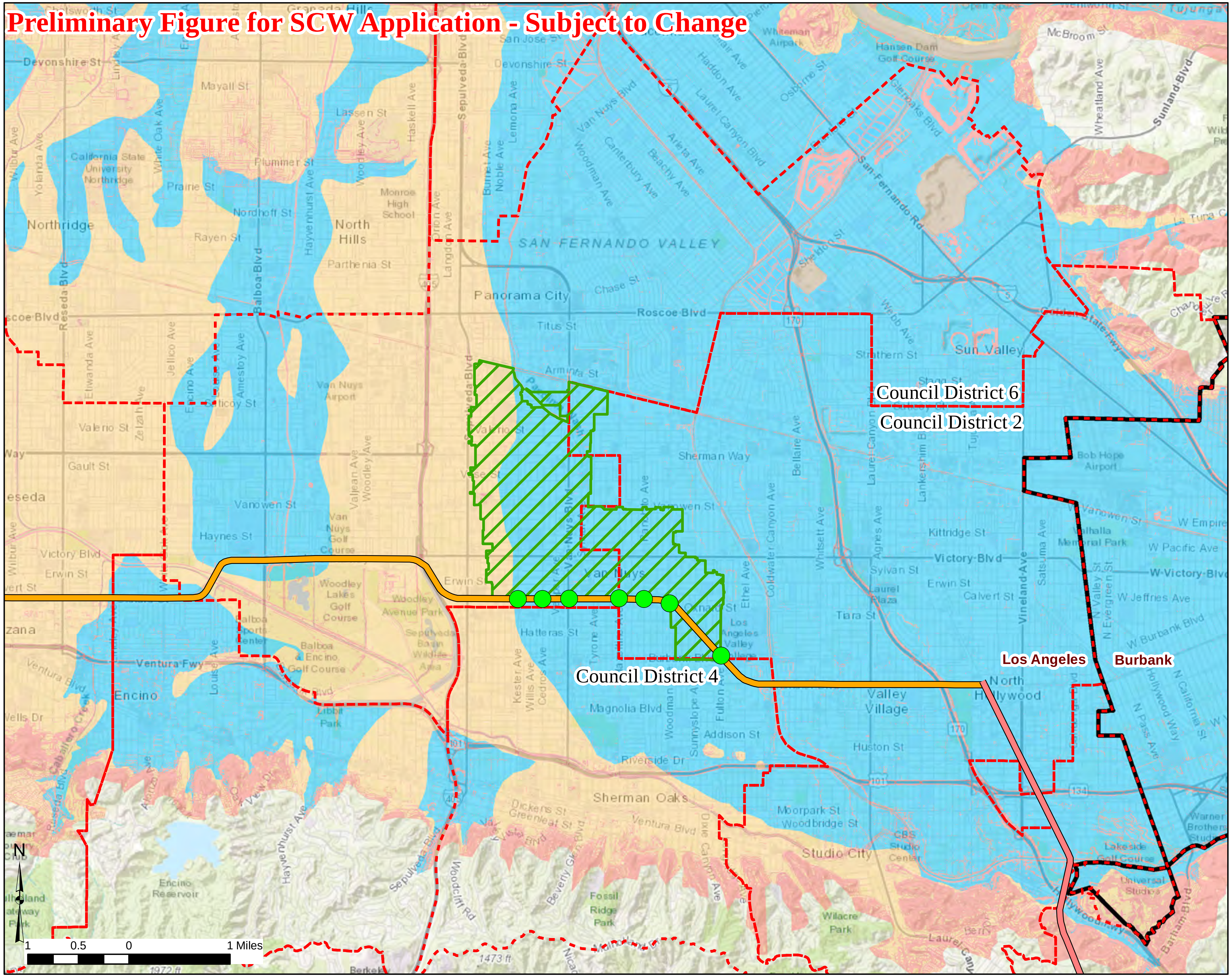
Los Angeles | October 2020

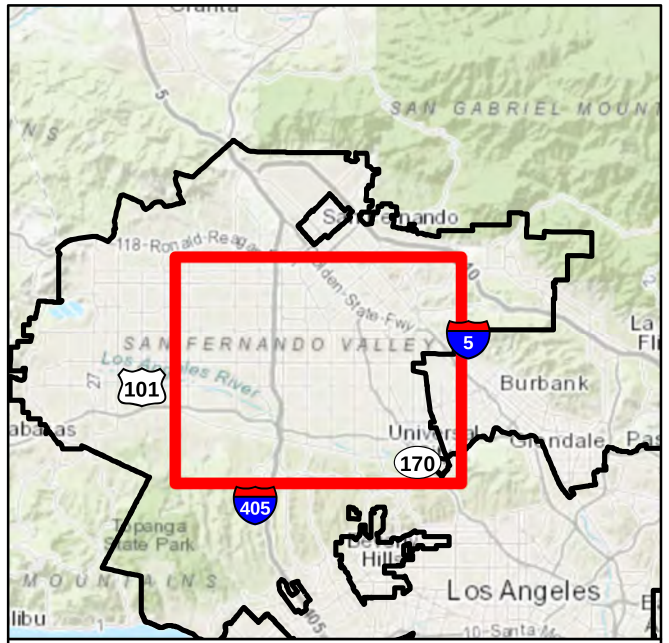
**Figure**

**7**

P:\GIS\Metro FS LA0583005\Project\Geotech\Fig 07_Geologic Hazards.mxd

**Preliminary Figure for SCW Application - Subject to Change**





**Legend**

- ● Proposed Drywell Clusters
- ▬ Metro Orange Line
- ▬ Metro Red Line
- ▨ Metro Stormwater Drainage
- ☐ Los Angeles City Boundary
- ⬚ City Council District Boundary

**Geophysical Category**[1]

- 🟦 A
- 🟨 B
- 🟥 C
- ⬜ n/a

1. Los Angeles River Master Plan. Los Angeles County, 2019
Geophysical Category A: Area most conducive to groundwater recharge.
Geophysical Category B: Area somewhat conducive to groundwater recharge.
Geophysical Category C: Area least conducive to groundwater recharge.

## SCMP Geophysical Category (Aquifer Class)

**Metro Orange Line Water Infiltration and Quality Project - Geotechnical Review**

Los Angeles, CA

Geosyntec consultants

Los Angeles | October 2020

**Figure 8**

P:\GIS\Metro FS LA0583005\Project\Geotech\Fig 08_SCMP Geophysical Category (Aquifer Class).mxd

# APPENDIX A

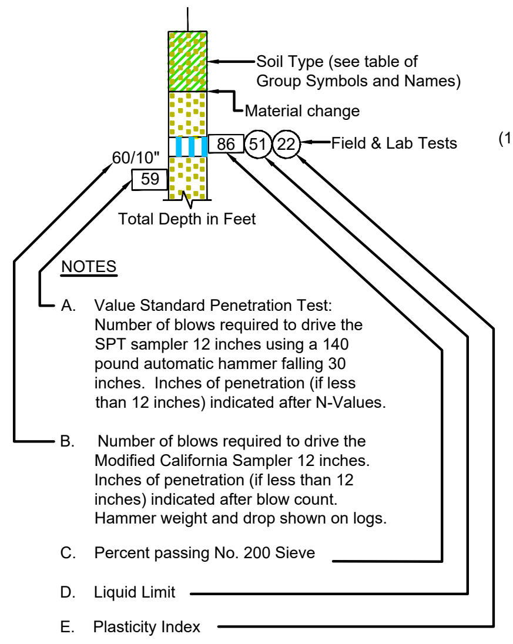
## Metro Orange Line Bus Rail Transit Improvement Project 30% Geotechnical Study – Boring Logs and CPT Data

## EXPLANATION

- **G-1** ● Geotech Boring
- **CPT-4** ▲ Cone Penetration Test
- **A-721566** ◐ Prior Investigation (LeRoy Crandall and Associates))
- **B-50** ◕ Prior Investigation (Diaz-Yourman)
- **LPE-10** ⊕ Prior Investigation (Earth Technologies Corporation)
- **3732A** ◉ LACDPW Groundwater Monitoring Well

PRELIMINARY - NOT FOR CONSTRUCTION

Exploration Number



NOTES

A. Value Standard Penetration Test: Number of blows required to drive the SPT sampler 12 inches using a 140 pound automatic hammer falling 30 inches. Inches of penetration (if less than 12 inches) indicated after N-Values.

B. Number of blows required to drive the Modified California Sampler 12 inches. Inches of penetration (if less than 12 inches) indicated after blow count. Hammer weight and drop shown on logs.

C. Percent passing No. 200 Sieve

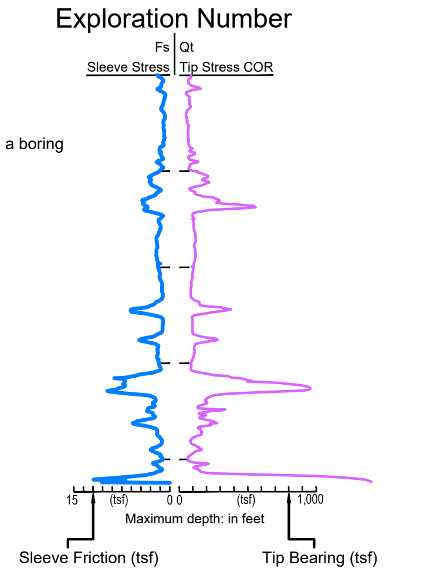
D. Liquid Limit

E. Plasticity Index

ROTARY, BUCKET & HOLLOW STEM BORING

▼ Overnight groundwater depth measured in a boring
(10/11/18)

Exploration Number



CONE PENETRATION TEST (CPT) SOUNDING

(S): Shear Wave Velocity Survey

ft bgs: depth of boring in feet below ground surface elevation at time of drilling

GROUP SYMBOLS AND NAMES

| Graphic/Symbol | | Group Names |
|---|---|---|
| ▨ | FILL | CLAYEY Artificial FILL |
| ▨ | | SILTY SAND or CLAYEY SAND Artificial FILL |
| ▨ | | SANDY Artificial FILL |
| ▨ | CL | Lean CLAY |
| ▨ | | SANDY lean CLAY |
| ▨ | | Lean CLAY with GRAVEL |
| ▨ | CL-ML | SILTY CLAY |
| ▨ | | SILTY CLAY with GRAVEL |
| ▨ | CL-CH | Lean to fat CLAY |
| ▨ | | Lean to fat CLAY with GRAVEL |
| ▨ | CH | Fat CLAY |
| ▨ | | Fat CLAY with SAND |
| ▨ | | Fat CLAY with GRAVEL |
| ▨ | ML | SILT |
| ▨ | | SILT with SAND |
| ▨ | | SANDY SILT |
| ▨ | MH | Elastic SILT |
| ▨ | | Elastic SILT with GRAVEL |

GROUP SYMBOLS AND NAMES

| Graphic/Symbol | | Group Names |
|---|---|---|
| ▨ | SM | SILTY SAND |
| ▨ | | SILTY SAND with GRAVEL |
| ▨ | SP-SM | Poorly graded SAND with SILT |
| ▨ | | Poorly graded SAND with SILT and GRAVEL |
| ▨ | SC-SM | SILTY, CLAYEY SAND |
| ▨ | | SILTY, CLAYEY SAND with GRAVEL |
| ▨ | SC | CLAYEY SAND |
| ▨ | | CLAYEY SAND with GRAVEL |
| ▨ | SP | Poorly graded SAND |
| ▨ | | Poorly graded SAND with GRAVEL |
| ▨ | SW | Well-graded SAND |
| ▨ | | Well-graded SAND with GRAVEL |

100' 0 100' 200'

HORIZONTAL: 1" = 100'

20' 10' 0 20' 40'

VERTICAL: 1" = 20'

| REV | DATE | BY | APP | REG NO | EXPIRES | SEAL HOLDER | DESCRIPTION |
|---|---|---|---|---|---|---|---|
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |

DESIGNED BY
PER

DRAWN BY
VMN

CHECKED BY
JF

IN CHARGE
HP / PM

DATE
08/20/2020

FOR INFORMATION ONLY NOT FOR CONSTRUCTION

Metro

**LOS ANGELES COUNTY**
**METROPOLITAN TRANSPORTATION AUTHORITY**

**MOTT MACDONALD**

1000 Wilshire Blvd, Suite 400
Los Angeles, CA 90017
Tel: 818-506-8088

wood.

PRELIMINARY - NOT FOR CONSTRUCTION

FOR INFORMATION ONLY
NOT FOR CONSTRUCTION

METRO ORANGE LINE
SEPULVEDA GRADE SEPARATION
EXPLORATION PLAN
AND PROFILE

CONTRACT NO

DRAWING NO

REV

SCALE
1"=100'

FIGURE NO
3

G:\4953_Geotech\2018\180121 Metro Orange Line\CAD\DWG\4953-18-0121_Fig-3_Plot-Plan(20.08.19).dwg Tuesday, September 01, 2020 12:13:53 PM

# APPENDIX B

## Boring Logs Provided by Torrent Resources

TORRENT RESOURCES (CA), INCORPORATED
3200 E. Guasti Rd. #100
Ontario, CA 91731
909/638-6644 Fax: 909/456-8851
CA Lic. 886759 A C142
www.TorrentResources.com

# DRILLING LOG

LOG NO. ________
JOB NO. 1405-304

*An evolution of McGuckin Drilling*

| | |
|---|---|
| **Project Name:**<br>Keyes Chevrolet | **Project Address:**<br>SEC of Van Nuys & Oxnard St |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Contractor:** | **HOLE** | **1** | **2** | **3** | **4** | **5** | **6** |
| [redacted] | **WELL TYPE** | IV | IV | IV | IV | IV | IV |
| **Contractors Address:** | **DATE** | 5/14/14 | 5/15-16 | 5/12-13 | 5/12 | 5/19 | 5/19-20 |
| [redacted] | **CREW** | GH | GH | GH | GH | GH | GH |
| | **EQUIP #** | R-2 | R-2 | R-2 | R-2 | R-2 | R-2 |
| | **CUT/FILL-DW** | F1$^{13}$ | F-2$^{65}$ | F1$^{03}$ | F$^{98}$ | F.1$^{64}$ | F.1$^{55}$ |
| 13-11-7-4-DL | **CUT/FILL-PSC** | | | | | | |

| **SOIL DESCRIPTION** | | | | | | |
|---|---|---|---|---|---|---|
| Silt, Clay | 1-22 | 1-20 | 1-18 | 1-26 | 1-25 | 1-20 |
| Clay | | | 18-25 | | | |
| Sand, Clay | 22-30 | 20-25 | 25-32 | 26-33 | 25-32 | 20-30 |
| Silt, Clay | 30-35 | 25-35 | 32-35 | 33-35 | 32-35 | 30-35 |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| **TOTAL DEPTH** | 35' | 35' | 35' | 35' | 35' | 35' |
| **BACKFILLED 10'** | | | | | | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| CEMENTATION | BELLED OUT | | | | | | |
| | HARD | | | | | | |
| | VERY HARD | | | 18-25 | | | |
| | REFUSAL | | | | | | |
| SOIL MOISTURE | MOIST | | | | | | |
| | SATURATED | | | | | | |
| **PERCOLATION TEST RESULTS** | | | | | | | |
| **LATITUDE** | | | | | | | |
| **LONGITUDE** | | | | | | | |

COMMENTS:

FIELD CHANGES
☐ ADD/DEDUCT DEPTH
☐ HARD ROCK @ TIME & MATERIALS

APPROVED BY:________________________________

TITLE:________________ DATE:________________

COMPLETED BY________________ DATE____________

N
W E
S

TORRENT RESOURCES INCORPORATED
1509 E Elwood Street
Phoenix, AZ 85040
602/268-0785 Fax: 602/268-0820
AZ Lic. ROC070465 A, ROC047067 B-4; ADWR 363
CA Lic. 528080 A, C-42, HAZ; NV Lic. 0035350 A
NM Lic. 90504 GF04
www.TorrentResources.com

TORRENT RESOURCES

# DRILLING LOG

LOG NO. ________

JOB NO. 1405-304

*An evolution of McGuckin Drilling*

**Project Name:**
Keyes Chevrolet

**Project Address:**
SWC of Van Nuys & Oxnard St

**Contractor:**
[redacted]

**Contractors Address:**
[redacted]

13-11-7-4-DL

| | | | | | | |
|---|---|---|---|---|---|---|
| **HOLE** | **7** | **8** | **9** | **10** | **11** | **12** |
| **WELL TYPE** | IV | IV | IV | | | |
| **DATE** | 5/22 | 5/21 | 5/21 | | | |
| **CREW** | GH | GH | GH | | | |
| **EQUIP #** | R-2 | R-2 | R-2 | | | |
| **CUT/FILL-DW** | F.$^{16}$ | F.$^{88}$ | F.$^{42}$ | | | |
| **CUT/FILL-PSC** | | | | | | |
| **SOIL DESCRIPTION** | | | | | | |
| Silt, Clay | 1-15 | 1-15 | 1-10 | | | |
| Clay | | | 10-18 | | | |
| Sand, Clay | 15-25 | 15-26 | 18-26 | | | |
| Silt, Clay | 25-35 | 26-35 | 26-35 | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| **TOTAL DEPTH** | 35' | 35' | 35' | | | |
| **BACKFILLED 10' PER ADEQ REQUIREMENTS** | | | | | | |
| CEMENTATION – BELLED OUT | | | | | | |
| CEMENTATION – HARD | | | | | | |
| CEMENTATION – VERY HARD | | | 10-18' | | | |
| CEMENTATION – REFUSAL | | | | | | |
| SOIL MOISTURE – MOIST | | | | | | |
| SOIL MOISTURE – SATURATED | | | | | | |
| **PERCOLATION TEST RESULTS** | | | | | | |
| **LATITUDE** | | | | | | |
| **LONGITUDE** | | | | | | |

COMMENTS:

FIELD CHANGES

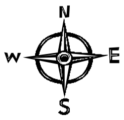
☐ ADD/DEDUCT DEPTH

☐ HARD ROCK @ TIME & MATERIALS

APPROVED BY:________________________________

TITLE:________________ DATE:_________________

COMPLETED BY________________ DATE_____________



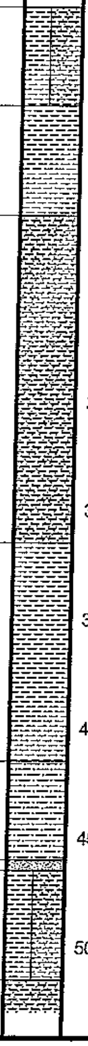
**WAYNE PERRY, INC.**
8281 Commonwealth Avenue
Buena Park, California 90621
(714) 826-0352
www.wpinc.com

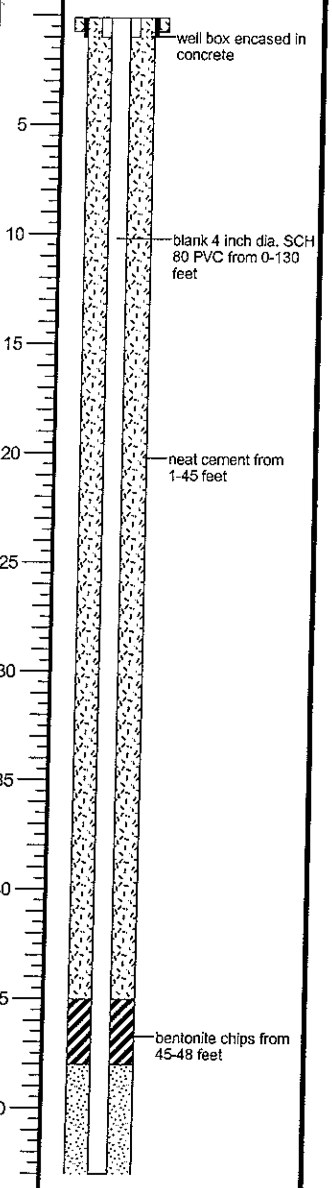
# Log of Boring/Well SVE-1

| | |
|---|---|
| PROJECT: *Sawyer Petroleum* | SURFACE ELEVATION: *Not Measured* |
| LOCATION: *14117 AETNA ST., VAN NUYS, CA* | TOTAL DEPTH: *151 5 feet* BORING DIAMETER: *8 inches* |
| PROJECT NO : *06 202* | DEPTH TO FIRST SATURATION: *N/A* |
| DATE BEGAN: *9/7/06* FINISHED: *9/12/06* | TOP OF WELL CASING ELEVATION: *N/A* |
| DRILLING COMPANY: *Water Development Corporation* | STATIC GW ELEVATION: DATE: *N/A* |
| DRILLING METHOD: *Hollow-Stem Auger* | LOGGED BY: *E. Kuhn* CHECKED BY: *D. Henry* |

This log is a representation of subsurface conditions at the time and place of drilling. With the passage of time or at any other location, there may be consequential changes in conditions

| DEPTH (feet) | Sample I D | Time | Blow Counts (per 6 inches) | PID/LEL (ppm/%) | Geologic Description | Soil Class |
|---|---|---|---|---|---|---|
| | | | | | **AIRKNIFED TO 7 FEET** | |
| | | | | | **SILT with Sand** - dark brown [10YR 3/3], very stiff moist; fine- to medium-grained; trace clay | ml |
| 10 | SVE-1d10 | 1019 | 10/12/15 | 0.0 | | |
| | | | | | **SILT** - dark brown [10YR 3/3], very stiff, moist; trace clay; trace amount of fine gravel; trace fine- to medium-grained sand | ml |
| 15 | SVE-1d15 | 1027 | 11/15/20 | 0.0 | | |
| | | | | | **Sandy SILT** - dark brown [10YR 3/3] dense, moist; fine- to medium-grained sand; trace clay | ml |
| 20 | SVE-1d20 | 1042 | 15/15/20 | 0 3 | | |
| 25 | SVE-1d25 | 1053 | 15/18/22 | 0.0 | | |
| 30 | SVE-1d30 | 1101 | 10/12/18 | 0.0 | | |
| | | | | | **SILT** - dark yellowish brown [10YR 3/4] very stiff moist; trace clay; trace fine- to medium-grained sand.<br>dark brown [7 5YR 3/4] hard | ml |
| 35 | SVE-1d35 | 1109 | 15/17/25 | 0 0 | | |
| 40 | SVE-1d40 | 1116 | 10/16/22 | 2.3 | | |
| | | | | | **Silty SAND** - fine- to medium-grained, very dark grayish brown [10YR 3/2], dense moist; trace amount of fine gravel | sm |
| 45 | SVE-1d45 | 1232 | 17/17/18 | 4.4 | | |
| | | | | | **SAND** - fine- to coarse-grained, yellow brown [10YR 5/4], dense, moist. | sp |
| | | | | | **SILT with Sand** - dark brown [10YR 3/3], hard, moist; fine- to medium-grained sand; trace clay | ml |
| 50 | SVE-1d50 | 1246 | 25/25/30 | 25.1 | | |
| | | | | | | ml |





Remarks/Notes: 1) PID Used:

**WAYNE PERRY, INC.**
8281 Commonwealth Avenue
Buena Park, California 90621
(714) 826-0352
www.wpinc com

# Log of Boring/Well SVE-1

PROJECT: *Sawyer Petroleum*

PROJECT NO : *06.202*

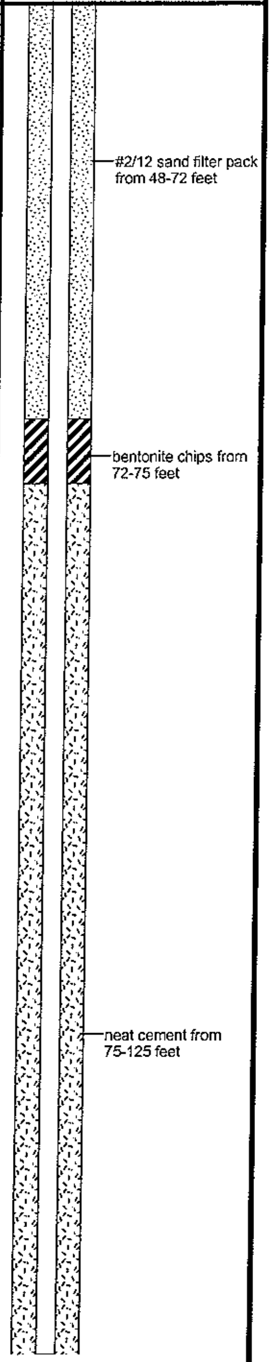
LOCATION: *14117 AETNA ST., VAN NUYS, CA*

DATE BEGAN: *9/7/06*  FINISHED: *9/12/06*

This log is a representation of subsurface conditions at the time and place of drilling. With the passage of time or at any other location there may be consequential changes in conditions.

| DEPTH (feet) | Sample I D. | Time | Blow Counts (per 6 inches) | PID/LEL (ppm/%) | Geologic Description | Soil Class |
|---|---|---|---|---|---|---|
| 55 | SVE-1d55 | 1310 | 20/25/25 | 22.8 | **Sandy SILT** - dark brown [10YR 3/3]. hard moist; fine- to medium-grained sand; very dark grayish brown [10YR 3/3]; | |
| 60 | SVE-1d60 | 1407 | 10/12/20 | 59 7 | dark brown [10YR 3/3] trace amount of fine gravel; | |
| 65 | | | | | no sample recovery at 65 feet | |
| 70 | SVE-1d70 | 1031 | 13/20/25 | 180 | **SILT with Sand** - dark yellowish brown [10YR 3/4], hard, moist; fine- to medium-grained sand; trace amount of fine gravel | ml |
| 75 | SVE-1d75 | 1043 | 32/50 | 39 6 | **SILT** - dark brown [10YR 3/3], hard, moist; trace fine- to medium-grained sand; trace amount of fine gravel | ml |
| 80 | SVE-1d80 | 1103 | 20/23/27 | 134 | **SILT with Sand** - very dark grayish brown [10YR 3/2], hard, moist; fine- to medium-grained sand; trace amount of fine gravel | ml |
| 85 | SVE-1d85 | 1122 | 19/20/21 | 29.4 | **Silty SAND** - fine- to medium-grained, brown [10YR 4/3], dense moist; trace amount of fine and coarse gravel;<br>olive brown [2.5Y 4/3], very dense. | sm |
| 90 | SVE-1d90 | 1136 | 25/50 | 46 4 | **SAND with Gravel** - fine- to coarse-grained dark grayish brown [2 5Y 5/2], very dense moist; fine and coarse gravel | ml |
| 95 | SVE-1d95 | 1331 | 20/22/25 | 63.8 | **Sandy SILT** - brown [10YR 4/3], hard, moist; fine- to medium-grained sand; trace clay.<br>**SILT with Sand** - olive brown [2.5Y 4/3] hard, moist; fine-grained sand | ml<br>ml |
| 100 | SVE-1d100 | 1356 | 19/22/26 | 64.8 | **SILT** - dark olive brown [2.5Y 3/3], hard, moist; trace fine- to medium-grained sand | ml |
| 105 | SVE-1d105 | 1458 | 35-50 | 2.1 | **Sandy SILT** - dark brown [7 5YR 3/3] hard moist; fine- to medium-grained sand | ml |
| 110 | SVE-1d110 | 1523 | 22/23/27 | 1 7 | brown [10YR 4/3] trace amount fine gravel | |

Well Diagram



Remarks/Notes: 1) PID Used:

**WAYNE PERRY, INC.**
8281 Commonwealth Avenue
Buena Park, California 90621
(714) 826-0352
www.wpinc.com

# Log of Boring/Well SVE-1

PROJECT: *Sawyer Petroleum*

PROJECT NO.: *06.202*

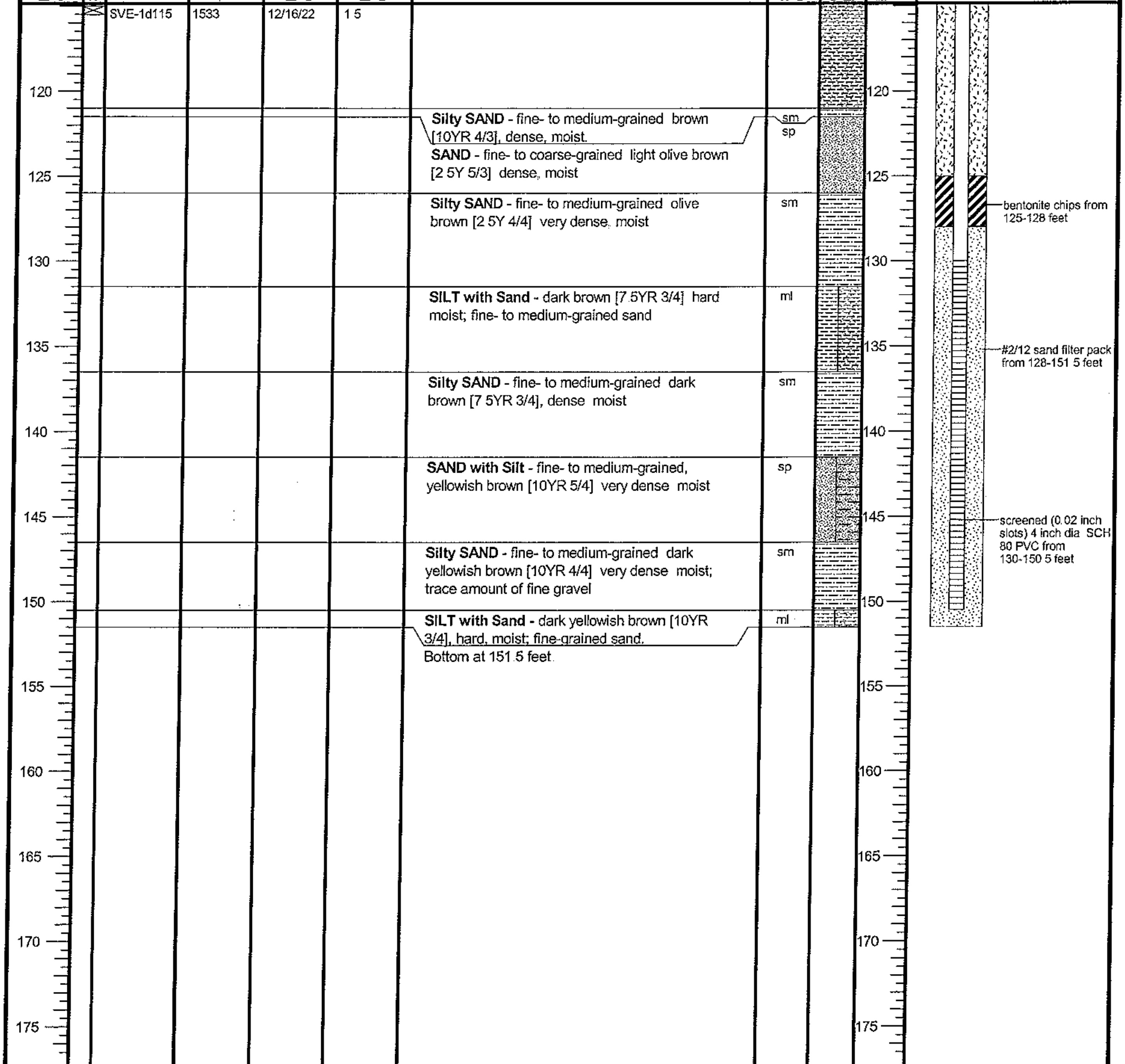
LOCATION: *14117 AETNA ST., VAN NUYS, CA*

DATE BEGAN: *9/7/06*

FINISHED: *9/12/06*

This log is a representation of subsurface conditions at the time and place of drilling. With the passage of time or at any other location, there may be consequential changes in conditions.

| DEPTH (feet) | Samples | Sample I.D. | Time | Blow Counts (per 6 inches) | PID/LEL (ppm/%) | Geologic Description | Soil Class |
|---|---|---|---|---|---|---|---|
|  | ⊠ | SVE-1d115 | 1533 | 12/16/22 | 1.5 |  |  |
|  |  |  |  |  |  | **Silty SAND** - fine- to medium-grained brown [10YR 4/3], dense, moist. | sm |
|  |  |  |  |  |  | **SAND** - fine- to coarse-grained light olive brown [2.5Y 5/3] dense, moist | sp |
|  |  |  |  |  |  | **Silty SAND** - fine- to medium-grained olive brown [2.5Y 4/4] very dense, moist | sm |
|  |  |  |  |  |  | **SILT with Sand** - dark brown [7.5YR 3/4] hard moist; fine- to medium-grained sand | ml |
|  |  |  |  |  |  | **Silty SAND** - fine- to medium-grained dark brown [7.5YR 3/4], dense moist | sm |
|  |  |  |  |  |  | **SAND with Silt** - fine- to medium-grained, yellowish brown [10YR 5/4] very dense moist | sp |
|  |  |  |  |  |  | **Silty SAND** - fine- to medium-grained dark yellowish brown [10YR 4/4] very dense moist; trace amount of fine gravel | sm |
|  |  |  |  |  |  | **SILT with Sand** - dark yellowish brown [10YR 3/4], hard, moist; fine-grained sand.<br>Bottom at 151.5 feet. | ml |



Remarks/Notes: 1) PID Used:

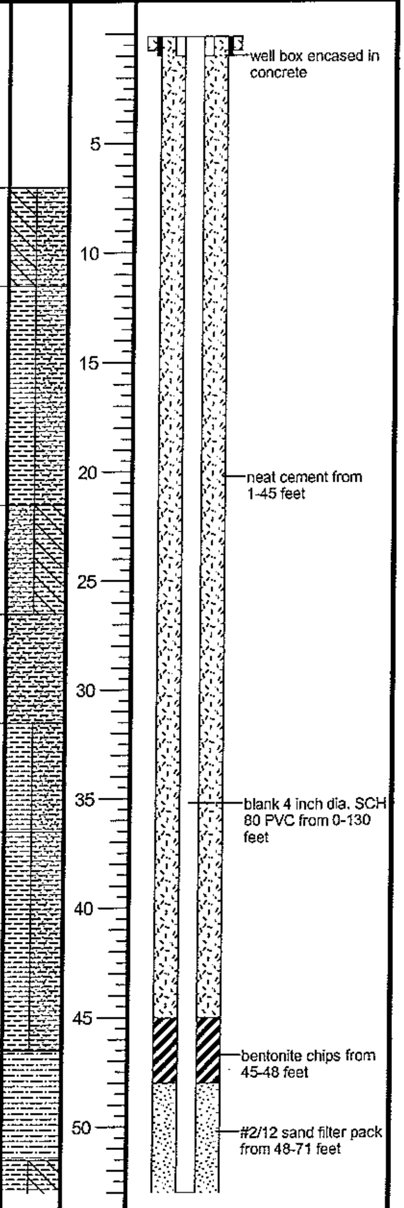
**WAYNE PERRY, INC.**
8281 Commonwealth Avenue
Buena Park, California 90621
(714) 826-0352
www.wpinc.com

# Log of Boring/Well SVE-2

| | |
|---|---|
| PROJECT: *Sawyer Petroleum* | SURFACE ELEVATION: *Not Measured* |
| LOCATION: *14117 AETNA ST., VAN NUYS, CA* | TOTAL DEPTH: *152 feet* BORING DIAMETER: *8 inches* |
| PROJECT NO.: *06.202* | DEPTH TO FIRST SATURATION: *N/A* |
| DATE BEGAN: *9/5/06* FINISHED: *9/7/06* | TOP OF WELL CASING ELEVATION: *N/A* |
| DRILLING COMPANY: *Water Development Corporation* | STATIC GW ELEVATION: DATE: *N/A* |
| DRILLING METHOD: *Hollow-Stem Auger* | LOGGED BY: *E. Kuhn* CHECKED BY: *D. Henry* |

This log is a representation of subsurface conditions at the time and place of drilling. With the passage of time or at any other location there may be consequential changes in conditions

| Sample I.D | Time | Blow Counts (per 6 inches) | PID/LEL (ppm/%) | Geologic Description | Soil Class |
|---|---|---|---|---|---|
| | | | | **AIRKNIFED TO 7 FEET** | |
| | | | | **SILT with Sand and Clay** - dark yellowish brown [10YR 3/4], very stiff, moist; fine- to medium-grained sand; trace amount of fine gravel | ml |
| SVE-2d10 | 1049 | 6/6/10 | 0.1 | | |
| | | | | **SILT with Sand** - dark yellowish brown [10YR 3/4], very stiff, moist; fine- to medium-grained sand; trace clay | ml |
| SVE-2d15 | 1103 | 5/8/10 | 0.0 | | |
| SVE-2d20 | 1114 | 6/10/12 | 0.0 | | |
| | | | | **Sandy SILT with Clay** - dark brown [10YR 3/3] very stiff, moist; fine- to medium-grained sand; trace amount of fine gravel | ml |
| SVE-2d25 | 1117 | 12/15/15 | 0.0 | | |
| | | | | **Sandy SILT** - dark brown [10YR 3/3] very stiff, moist; fine- to medium-grained sand; trace clay | ml |
| SVE-2d30 | 1126 | 16/20/23 | 0.6 | | |
| | | | | **SILT with Sand** - dark brown [10YR 3/3], hard, moist; fine- to medium-grained sand; trace clay. | ml |
| SVE-2d35 | 1134 | 10/16/20 | 0.5 | | |
| | | | | **SILT with Sand** - very dark grayish brown [10YR 3/2] hard moist; fine- to medium-grained sand | ml |
| SVE-2d40 | 1255 | 17/20/22 | 45 0 | | |
| SVE-2d45 | 1307 | 22/23/25 | 76.7 | | |
| | | | | **Silty SAND** - fine- to medium-grained olive brown [2 5Y 4/4] dense moist. | sm |
| SVE-2d50 | 1316 | 18/25/21 | 72 | | |
| | | | | | ml |



Remarks/Notes: 1) PID Used:

# Log of Boring/Well SVE-2

PROJECT: *Sawyer Petroleum*

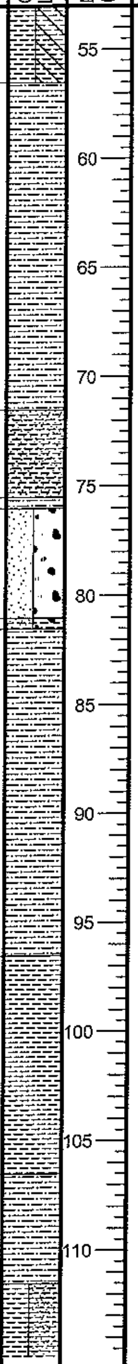
PROJECT NO.: *06.202*

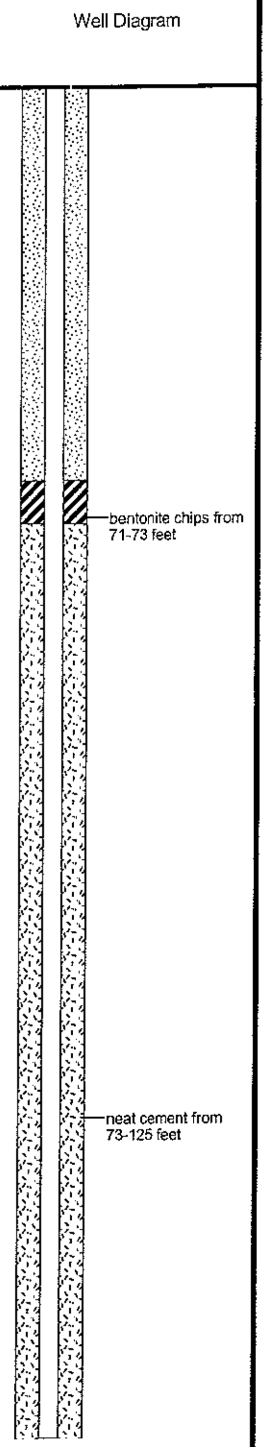
LOCATION: *14117 AETNA ST., VAN NUYS, CA*

DATE BEGAN: *9/5/06* FINISHED: *9/7/06*

This log is a representation of subsurface conditions at the time and place of drilling. With the passage of time or at any other location, there may be consequential changes in conditions.

| DEPTH (feet) | Sample I D | Time | Blow Counts (per 6 inches) | PID/LEL (ppm/%) | Geologic Description | Soil Class |
|---|---|---|---|---|---|---|
| | | | | | **SILT with Clay** - dark brown [10YR 3/3], hard moist; trace fine- to medium-grained sand | |
| 55 | SVE-2d55 | 1321 | 12/14/16 | 116 | **Silty SAND** - fine- to medium-grained, dark olive brown [2 5Y 3/3] dense moist; | sm |
| 60 | SVE-2d60 | 1331 | 16/19/22 | 325 | | |
| 65 | SVE-2d65 | 1338 | 20/23/23 | 85 2 | trace amount of fine gravel. | |
| 70 | SVE-2d70 | 1412 | 12/14/18 | 35.4 | **Sandy SILT** - dark olive brown [2 5Y 3/3] hard moist; fine- to medium-grained sand | ml |
| 75 | SVE-2d75 | 1425 | 12/20/20 | 9.1 | **Silty SAND** - fine- to medium-grained, dark olive brown [2.5Y 3/3], dense, moist; trace clay.<br>**SAND with Gravel** - fine- to coarse-grained, dark grayish brown [2 5Y 4/2] dense moist; fine to coarse gravel. | sm<br>sp |
| 80 | SVE-2d80 | 1441 | 12/14/19 | 119 | **SAND with Silt and Gravel** - fine- to coarse-grained, dark grayish brown [10YR 4/2] dense, moist; fine to coarse gravel. | ml<br>sm |
| 85 | SVE-2d85 | 1452 | 35/51 | 3.4 | **Silty SAND** - fine- to medium-grained. dark brown [10YR 3/3] dense, moist; trace amount of fine gravel;<br>very dark grayish brown [10YR 3/3]. very dense; | |
| 90 | SVE-2d90 | 1506 | 35/50 | 0.0 | olive brown [2 5Y 4/3]. | |
| 95 | SVE-2d95 | 1519 | 19/23/22 | 112 | **SILT** - dark olive brown [2.5Y 3/3], hard, moist; trace clay; trace amount of fine gravel; trace fine- to medium-grained sand | ml |
| 100 | SVE-2d100 | 1535 | 16/20/20 | 73 | | |
| 105 | SVE-2d105 | 0819 | 12/15/19 | 12.4 | **Silty SAND** - fine- to medium-grained, dark brown [7.5YR 3/4], dense moist; trace amount of fine gravel; | sm |
| 110 | SVE-2d110 | 0851 | 23/25/27 | 2.6 | very dense.<br>**SILT with Sand** - dark brown [7 5YR 3/3] hard moist; fine- to medium-grained sand | <br>ml |





Remarks/Notes: 1) PID Used:

**WAYNE PERRY, INC.**
8281 Commonwealth Avenue
Buena Park, California 90621
(714) 826-0352
www.wpinc.com

# Log of Boring/Well SVE-2

PROJECT: *Sawyer Petroleum*

PROJECT NO.: *06.202*

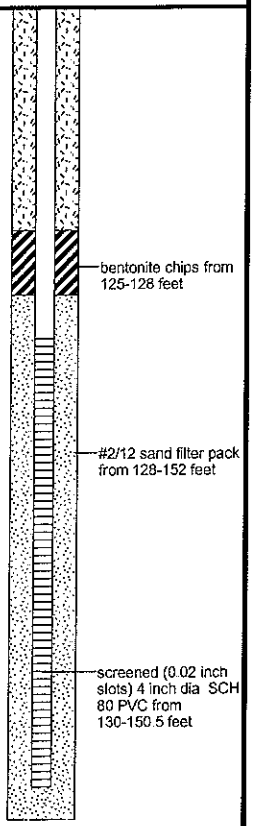
LOCATION: *14117 AETNA ST., VAN NUYS, CA*

DATE BEGAN: *9/5/06* FINISHED: *9/7/06*

This log is a representation of subsurface conditions at the time and place of drilling. With the passage of time or at any other location, there may be consequential changes in conditions

| DEPTH (feet) | Sample I.D. | Time | Blow Counts (per 6 inches) | PID/LEL (ppm/%) | Geologic Description | Soil Class |
|---|---|---|---|---|---|---|
|  | SVE-2d115 | 0927 | 18/20/22 | 22.4 | **Sandy SILT** - dark grayish brown [10YR 4/2] hard moist; trace amount of fine gravel. | ml |
| 120 | SVE-2d120 | 0942 | 23/50 | 144 | **SAND** - fine- to medium-grained yellowish brown [10YR 5/4] dense, moist;<br>very dense. | sp |
| 125 | SVE-2d125 | 0951 | 25/23/28 | 79.2 | **Silty SAND** - fine- to medium-grained, dark yellowish brown [10YR 3/6] very dense, moist | sm |
| 130 | SVE-2d130 | 1000 | 19/23/28 | 59.4 | **Sandy SILT** - dark olive brown [2.5Y 3/3], hard, moist; fine- to medium-grained sand; trace clay | ml |
| 135 | SVE-2d135 | 1013 | 21/24/25 | 29.3 | **Silty SAND** - fine- to medium-grained, very dark grayish brown [10YR 3/2] dense, moist. | sm |
| 140 | SVE-2d140 | 1034 | 20/27/30 | 25.9 | **SAND** - fine- to coarse-grained, yellowish brown [10YR 5/4], very dense, moist; trace amount of fine gravel | sp |
| 145 | SVE-2d145 | 1056 | 23/50 | 6.2 | **Silty SAND with Gravel** - fine- to coarse-grained very dark grayish brown [10YR 3/2], very dense, moist; fine gravel. | sm |
| 150 | SVE-2d150 | 1103 | 23/29/33 | 5.4 | **SILT with Sand** - very dark grayish brown [10YR 3/2], hard, moist; fine- to medium-grained sand; trace amount of fine gravel.<br>Bottom at 152 feet | ml |

Well Diagram



Remarks/Notes: 1) PID Used:

**WAYNE PERRY, INC.**
8281 Commonwealth Avenue
Buena Park, California 90621
(714) 826-0352
www.wpinc.com

# Log of Boring/Well W-8

PROJECT: *Sawyer Petroleum*

SURFACE ELEVATION: *Not Measured*

LOCATION: *14117 AETNA ST., VAN NUYS, CA*

TOTAL DEPTH: *193 feet*

BORING DIAMETER: *10 inches*

PROJECT NO.: *06 202*

DEPTH TO FIRST SATURATION: *173 feet*

DATE BEGAN: *9/12/06* FINISHED: *9/18/06*

TOP OF WELL CASING ELEVATION: *N/A*

DRILLING COMPANY: *Water Development Corporation*

STATIC GW ELEVATION: DATE: *N/A*

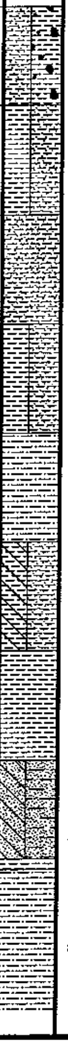
DRILLING METHOD: *Hollow-Stem Auger*

LOGGED BY: *E. Kuhn* CHECKED BY: *D. Henry*

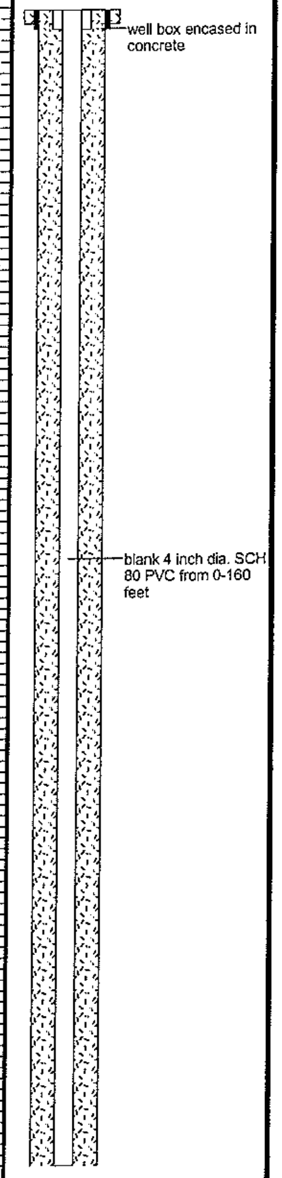
This log is a representation of subsurface conditions at the time and place of drilling. With the passage of time or at any other location, there may be consequential changes in conditions

| DEPTH (feet) | Samples | Sample ID | Time | Blow Counts (per 6 inches) | PID/LEL (ppm/%) | Geologic Description | Soil Class |
|---|---|---|---|---|---|---|---|
| | | | | | | **AIRKNIFED TO 7 FEET** | |
| | | | | | | **Sandy SILT with Gravel** - dark brown [7.5YR 3/3], hard moist; fine- to medium-grained sand; fine gravel | ml |
| 10 | ⊠ | W-8d10 | 1017 | 10/13/20 | 3.7 | | |
| | | | | | | **SILT with Sand** - brown [7.5YR 4/4], hard, moist; fine-grained sand; trace amount of fine gravel | ml |
| 15 | ⊠ | W-8d15 | 1023 | 9/15/20 | 2.6 | | |
| | | | | | | **Sandy SILT** - dark brown [7.5YR 3/3], hard, moist; fine- to medium-grained; trace clay | ml |
| 20 | ⊠ | W-8d20 | 1029 | 10/18/20 | 0.1 | | |
| | | | | | | **SILT with Sand** - dark brown [7.5YR 3/3], hard moist; fine- to medium-grained sand; trace clay | ml |
| 25 | ⊠ | W-8d25 | 1039 | 13/17/18 | 0.1 | | |
| | | | | | | **Silty SAND** - fine- to medium-grained, dark brown [7.5YR 3/4], dense, moist; trace amount of fine gravel | ml |
| 30 | ⊠ | W-8d30 | 1042 | 20/27/30 | 0.0 | | |
| | | | | | | **Clayey Silty SAND** - fine- to medium-grained dark brown [7.5YR 3/4] dense moist; trace amount of fine gravel | sm |
| 35 | ⊠ | W-8d35 | 1048 | 15/15/20 | 1.9 | | |
| | | | | | | **SILT** - dark brown [7.5YR 3/4] hard, moist; trace amount of fine-grained sand | ml |
| 40 | ⊠ | W-8d40 | 1055 | 18/19/22 | 2.7 | | |
| | | | | | | **Clayey Sandy SILT** - dark yellowish brown [10YR 3/4], hard, moist; fine- to medium-grained sand | ml |
| 45 | ⊠ | W-8d45 | 1100 | 15/19/22 | 62.9 | **SILT** - very dark brown [10YR 2/2], hard, moist. | ml |
| | | | | | | **Silty SAND** - fine- to medium-grained, dark yellowish brown [10YR 4/4], dense, moist; | sm |
| 50 | ⊠ | W-8d50 | 1110 | 20/23/27 | 12.6 | dark brown [10YR 3/3] very dense | |

Graphic Log



Well Diagram



Remarks/Notes: 1) PID Used:

**WAYNE PERRY, INC.**
8281 Commonwealth Avenue
Buena Park, California 90621
(714) 826-0352
www wpinc.com

# Log of Boring/Well W-8

PROJECT: *Sawyer Petroleum*

PROJECT NO.: *06 202*

LOCATION: *14117 AETNA ST., VAN NUYS, CA*

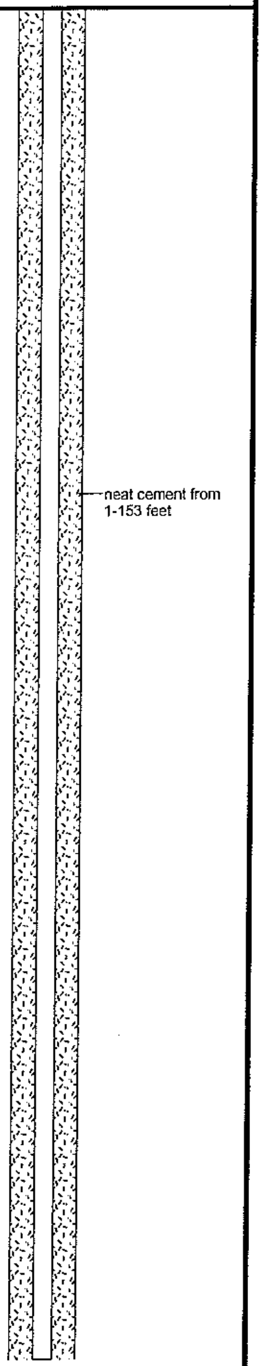
DATE BEGAN: *9/12/06*

FINISHED: *9/18/06*

This log is a representation of subsurface conditions at the time and place of drilling. With the passage of time or at any other location, there may be consequential changes in conditions

| DEPTH (feet) | Samples | Sample I D | Time | Blow Counts (per 6 inches) | PID/LEL (ppm/%) | Geologic Description | Soil Class | Graphic Log | DEPTH (feet) |
|---|---|---|---|---|---|---|---|---|---|
| 55 | | | | | | | | | 55 |
| | | W-8d55 | 1117 | 15/18/31 | 1 5 | **Clayey Sandy SILT** - very dark grayish brown [10YR 3/2] hard moist; fine- to medium-grained sand. | ml | | |
| | | | | | | **Sandy SILT** - dark brown [10YR 3/3] hard moist; fine- to medium-grained sand; trace amount of fine gravel. | ml | | |
| 60 | | W-8d60 | 1129 | 10/18/24 | 12.9 | | | | 60 |
| | | | | | | **Silty SAND** - fine- to medium-grained, dark yellowish brown [10YR 3/4] dense moist; trace amount of fine gravel. | sm | | |
| 65 | | W-8d65 | 1227 | 20/25/37 | 63 1 | | | | 65 |
| 70 | | W-8d70 | 2 | 14/30/37 | 1.8 | | | | 70 |
| | | | | | | **Clayey Silty SAND** - fine- to medium-grained, strong brown [7 5YR 3/4], very dense moist; trace amount of fine and coarse gravel | sm | | |
| 75 | | W-8d75 | 1307 | 33/50 | 206 | **Silty SAND** - fine- to medium-grained, dark yellowish brown [10YR 3/4] dense moist. | sm | | 75 |
| 80 | | W-8d80 | 1339 | 19/20/25 | 15.8 | | | | 80 |
| 85 | | W-8d85 | 1418 | 35/50 | 19 7 | **Clayey SILT** - dark gray [10YR 4/1] hard moist | ml | | 85 |
| 90 | | W-8d90 | 1423 | 20/27/42 | 24.9 | | | | 90 |
| | | | | | | **SILT** - dark grayish brown [2 5Y 4/2], hard moist. | ml | | |
| 95 | | W-8d95 | 1436 | 22/31/38 | 85.9 | | | | 95 |
| | | | | | | **Silty SAND** - fine- to medium-grained olive brown [2.5Y 4/3] very dense. moist | sm | | |
| 100 | | W-8d100 | 1443 | 25/50 | 3 4 | **Sandy SILT with Clay** - dark olive brown [ 2 5Y 3/3] hard, moist; fine- to medium-grained sand | ml | | 100 |
| 105 | | W-8d105 | 1458 | 10/25/33 | 12.9 | | | | 105 |
| | | | | | | **Silty SAND** - fine- to medium-grained, dark yellowish brown [10YR 3/6]. very dense, moist; trace amount of fine gravel. | sm | | |
| 110 | | W-8d110 | 1506 | 29/25/35 | 3.9 | | | | 110 |
| | | | | | | **Clayey Sandy SILT** - olive brown [2.5Y 4/4]. hard moist; fine- to medium-grained sand | ml | | |

Well Diagram



Remarks/Notes: 1) PID Used:

**WAYNE PERRY, INC.**
8281 Commonwealth Avenue
Buena Park, California 90621
(714) 826-0352
www.wpinc.com

# Log of Boring/Well W-8

PROJECT: *Sawyer Petroleum*

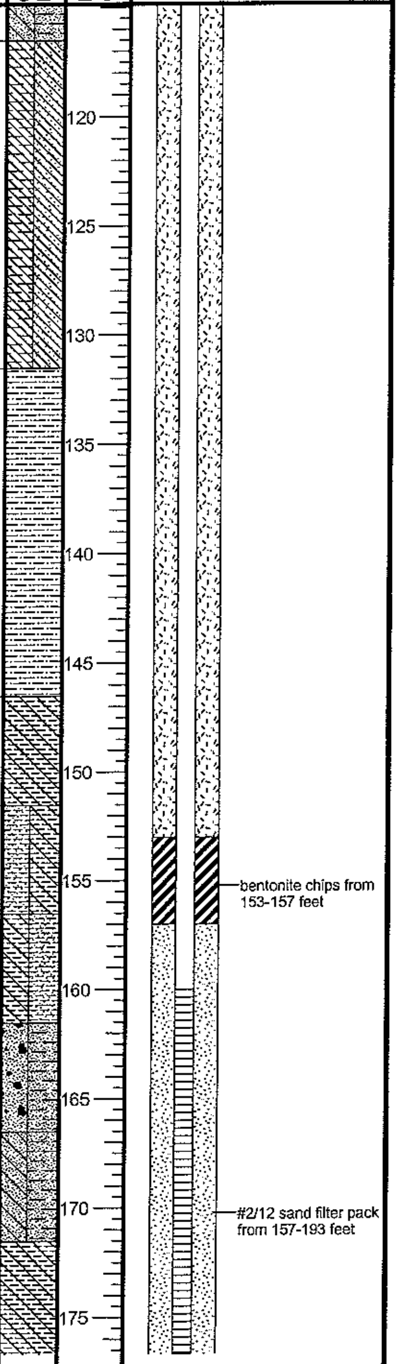
PROJECT NO : *06.202*

LOCATION: *14117 AETNA ST., VAN NUYS, CA*

DATE BEGAN: *9/12/06* FINISHED: *9/18/06*

This log is a representation of subsurface conditions at the time and place of drilling. With the passage of time or at any other location there may be consequential changes in conditions.

| DEPTH (feet) | Sample I.D. | Time | Blow Counts (per 6 inches) | PID/LEL (ppm/%) | Geologic Description | Soil Class |
|---|---|---|---|---|---|---|
| | W-8d115 | 1510 | 28/32/35 | 0.9 | **SILT with Clay and Sand** - brown [10YR 4/3], hard moist; fine- to medium-grained sand; | ml |
| 120 | | | | | no sample recovery at 120 feet; | |
| 125 | | | | | no sample recovery at 125 feet. | |
| 130 | W-8d130 | 1112 | 10/30/30 | 37.3 | **Silty SAND** - fine- to medium-grained, dark yellowish brown [10YR 3/6] very dense moist; | sm |
| 135 | W-8d135 | 1124 | 19/17/24 | 12 1 | dark brown [10YR 3/3] dense. trace amount of fine gravel; | |
| 140 | | | | | no sample recovery at 140 feet | |
| 145 | W-8d145 | 1222 | 15/20/30 | 0.1 | **Clayey SILT** - dark olive brown [2 5Y 3/3], hard moist; trace fine- to medium-grained; trace amount of fine gravel. | ml |
| 150 | W-8d150 | 1319 | 30/32/35 | 16.1 | **Sandy SILT with Clay** - dark olive brown [2.5Y 3/3], very dense, moist; fine- to medium-grained. | ml |
| 155 | W-8d155 | 1339 | 18/18/21 | 0.0 | **Clayey SILT with Sand** - dark brown [10YR 3/3], hard moist; fine- to medium-grained | ml |
| 160 | W-8d160 | 1401 | 19/25/20 | 0.0 | **Sandy Clayey SILT with Gravel** - dark grayish brown [10YR 4/2], hard, moist; fine- to coarse-grained sand; fine gravel. | ml |
| 165 | W-8d165 | 1435 | 18/20/25 | 0.0 | **Clayey Sandy SILT** - dark olive brown [ 2.5Y 3/3], hard, moist; fine- to medium-grained sand. | ml |
| 170 | W-8d170 | 1450 | 20/20/29 | 0.0 | **Clayey SILT** - dark olive brown [2.5Y 3/3], hard very moist; trace amount of fine-grained sand; | ml |
| ▽ 175 | | | | | | |



Remarks/Notes: 1) PID Used:

**WAYNE PERRY, INC.**
8281 Commonwealth Avenue
Buena Park, California 90621
(714) 826-0352
www.wpinc.com

# Log of Boring/Well W-8

PROJECT: *Sawyer Petroleum*

PROJECT NO.: *06 202*

LOCATION: *14117 AETNA ST., VAN NUYS, CA*

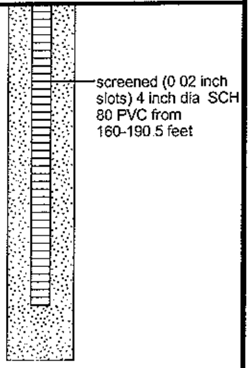
DATE BEGAN: *9/12/06*

FINISHED: *9/18/06*

This log is a representation of subsurface conditions at the time and place of drilling. With the passage of time or at any other location, there may be consequential changes in conditions.

| DEPTH (feet) | Samples | Sample I.D. | Time | Blow Counts (per 6 inches) | PID/LEL (ppm/%) | Geologic Description | Soil Class | Graphic Log | DEPTH (feet) |
|---|---|---|---|---|---|---|---|---|---|
| | | W-8d175 | 1506 | 20/20/25 | 0.0 | saturated; trace amount of fine- to medium-grained sand | | | |
| 180 | | W-8d180 | 1543 | 19/20/29 | 0.0 | **Sandy SILT** - olive brown [2.5Y 4/4] hard moist; fine- to medium-grained sand | ml | | 180 |
| 185 | | W-8d185 | 1611 | 18/19/30 | 0.0 | **Clayey SILT with Sand** - olive brown [2.5Y 4/3] hard moist; fine- to medium-grained sand | ml | | 185 |
| 190 | | W-8d190 | 1620 | 19/25/25 | 0.0 | **Silty SAND with Clay** - fine- to medium-grained dark brown [7.5YR 3/4], dense, moist. | sm | | 190 |
| | | | | | | Bottom at 193 feet | | | |
| 195 | | | | | | | | | 195 |
| 200 | | | | | | | | | 200 |
| 205 | | | | | | | | | 205 |
| 210 | | | | | | | | | 210 |
| 215 | | | | | | | | | 215 |
| 220 | | | | | | | | | 220 |
| 225 | | | | | | | | | 225 |
| 230 | | | | | | | | | 230 |
| 235 | | | | | | | | | 235 |

Well Diagram



Remarks/Notes: 1) PID Used:

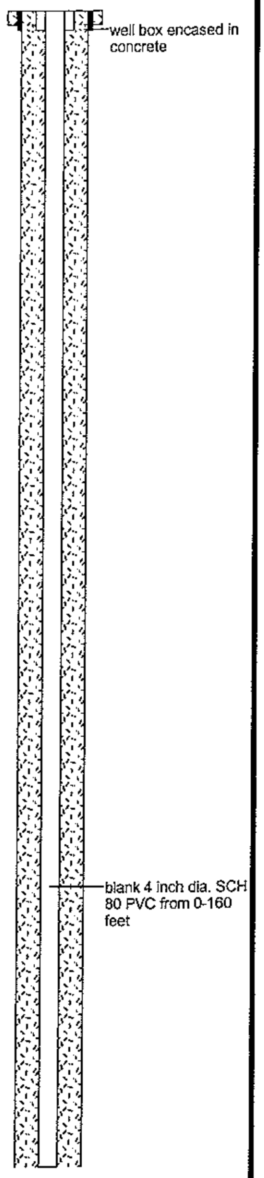
**WAYNE PERRY, INC.**
8281 Commonwealth Avenue
Buena Park, California 90621
(714) 826-0352
www wpinc com

# Log of Boring/Well W-9

PROJECT: *Sawyer Petroleum*
SURFACE ELEVATION: *Not Measured*
LOCATION: *14117 AETNA ST., VAN NUYS, CA*
TOTAL DEPTH: *193 feet*
BORING DIAMETER: *10 inches*
PROJECT NO : *06 202*
DEPTH TO FIRST SATURATION: *170 feet*
DATE BEGAN: *9/18/06* FINISHED: *9/29/06*
TOP OF WELL CASING ELEVATION: *N/A*
DRILLING COMPANY: *Water Development Corporation*
STATIC GW ELEVATION: DATE: *N/A*
DRILLING METHOD: *Hollow-Stem Auger*
LOGGED BY: *E. Kuhn* CHECKED BY: *D. Henry*

This log is a representation of subsurface conditions at the time and place of drilling. With the passage of time or at any other location, there may be consequential changes in conditions

| DEPTH (feet) | Samples | Sample I D. | Time | Blow Counts (per 6 inches) | PID/LEL (ppm/%) | Geologic Description | Soil Class | Graphic Log | DEPTH (feet) | Well Diagram |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | **AIRKNIFED TO 7 FEET** | | | | |
| 5 | | | | | | | | | 5 | |
| 10 | | W-9d10 | 0957 | 10/13/17 | 0 0 | **Clayey SILT** - very dark grayish brown [2 5Y 3/2], very stiff moist; trace fine- to medium-grained sand; trace fine gravel. | ml | | 10 | |
| 15 | | W-9d15 | 1005 | 15/15/19 | 0.0 | **Sandy SILT** - dark brown [7 5YR 3/3], hard moist; fine- to medium-grained sand | ml | | 15 | |
| 20 | | W-9d20 | 1014 | 19/20/21 | 0.0 | **Clayey Sandy SILT** - dark brown [7.5YR 3/3] hard moist; fine- to medium-grained sand | ml | | 20 | |
| 25 | | W-9d25 | 1021 | 15/16/24 | 0.0 | **Clayey SILT** - dark brown [ 10YR 3/3], hard moist; trace fine- to medium-grained sand | ml | | 25 | |
| 30 | | W-9d30 | 1028 | 17/17/20 | 0 0 | **Silty SAND** - fine- to medium-grained dark brown [7.5YR 3/4], dense, moist.<br>**SILT with Clay** - dark brown [10YR 3/3], hard, moist; trace fine- to medium-grained sand | sm<br>ml | | 30 | |
| 35 | | W-9d35 | 1038 | 15/16/20 | 0 0 | | | | 35 | |
| 40 | | W-9d40 | 1054 | 18/23/28 | 0.0 | **Clayey SILT** - dark brown [7 5YR 3/3] hard, moist; trace fine- to medium-grained sand; trace amount of fine gravel.<br>**Sandy SILT** - very dark brown [10YR 2/2] hard, moist; fine- to medium-grained sand | ml<br>ml | | 40 | blank 4 inch dia. SCH 80 PVC from 0-160 feet |
| 45 | | W-9d45 | 1105 | 19/20/20 | 3.1 | **Silty SAND** - fine- to medium-grained, very dark brown [10YR 2/2], dense moist | sm | | 45 | |
| 50 | | W-9d50 | 1110 | 17/20/23 | 17.9 | | ml | | 50 | |



Remarks/Notes: 1) PID Used:

**WAYNE PERRY, INC.**
8281 Commonwealth Avenue
Buena Park, California 90621
(714) 826-0352
www.wpinc.com

# Log of Boring/Well W-9

PROJECT: *Sawyer Petroleum*

PROJECT NO.: *06.202*

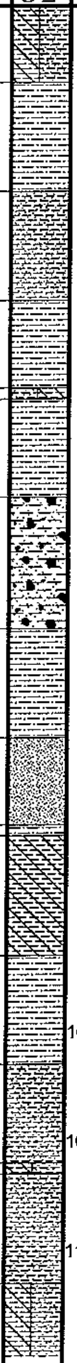
LOCATION: *14117 AETNA ST., VAN NUYS, CA*

DATE BEGAN: *9/18/06* FINISHED: *9/29/06*

This log is a representation of subsurface conditions at the time and place of drilling. With the passage of time or at any other location there may be consequential changes in conditions

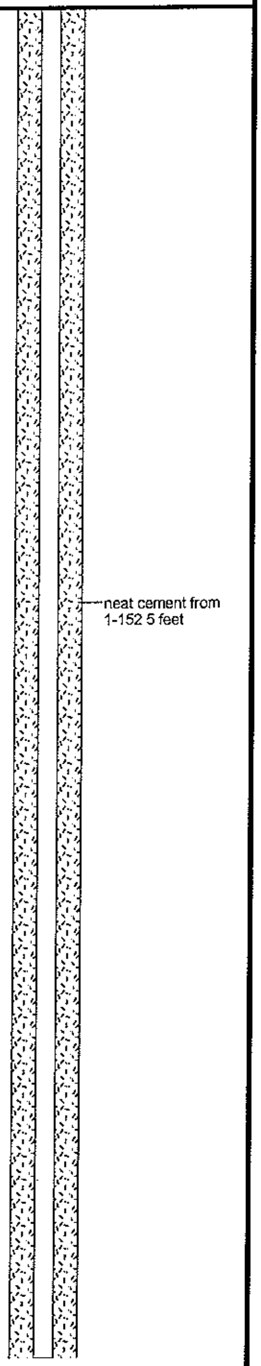
| DEPTH (feet) | Samples | Sample I D | Time | Blow Counts (per 6 inches) | PID/LEL (ppm/%) | Geologic Description | Soil Class |
|---|---|---|---|---|---|---|---|
| 55 | | | | | | **Clayey SILT with Sand** - black [10YR 2/1] hard moist; fine- to medium-grained sand | |
| | | W-9d55 | 1121 | 21/21/25 | 12.8 | **Silty SAND** - fine- to coarse-grained, dark yellowish brown [10YR 3/6], dense moist | sm |
| 60 | | W-9d60 | 1128 | 15/15/19 | 4.7 | **Sandy SILT** - dark olive brown [2.5Y 5/3] hard moist; fine- to medium-grained sand. | ml |
| 65 | | W-9d65 | 1136 | 20/21/25 | 16.1 | **Silty SAND** - fine- to medium-grained dark brown [10YR 3/3] dense, moist; trace amount of fine gravel | sm |
| 70 | | W-9d70 | 1245 | 15/25/50 | 53.6 | **Sandy SILT with Clay** - dark brown [10YR 3/3] hard, moist; fine- to medium-grained. | ml |
| | | | | | | **Silty SAND** - fine- to medium-grained, dark yellowish brown [10YR 3/6] very dense, moist; trace amount of fine gravel. | sm |
| 75 | | W-9d75 | 1256 | 52 | 0 1 | **Silty SAND with Gravel** - fine- to coarse-grained, dark olive brown [2.5Y 3/3] very dense moist; fine and coarse gravel | sm |
| 80 | | W-9d80 | 1305 | 12/30/30 | 94.7 | **Silty SAND** - fine- to medium-grained, dark olive brown [2.5Y 3/3], very dense moist; trace amount of fine gravel;<br>trace clay. | sm |
| 85 | | W-9d85 | 1319 | 13/15/18 | 95.3 | **SAND** - fine- to coarse-grained, olive gray [5Y 4/2] dense. moist; trace fine and coarse gravel | sp |
| 90 | | W-9d90 | 1334 | 13/16/19 | 26.0 | **Silty SAND** - fine- to medium-grained, light olive brown [2.5y 5/4], dense. moist; trace amount of fine gravel. | sm |
| | | | | | | **Clayey SILT** - olive brown [2.5Y 4/4], hard moist; trace fine- to medium-grained sand. | ml |
| 95 | | W-9d95 | 1352 | 16/18/21 | 7.8 | **Silty SAND** - fine- to medium-grained, dark olive brown [2.5Y 3/3], dense, moist; trace amount of coarse gravel | sm |
| 100 | | W-9d100 | 1403 | 15/13/15 | 1.9 | **Sandy SILT** - dark olive brown [2.5Y 3/3], very stiff. moist; fine- to medium-grained sand. | ml |
| 105 | | W-9d105 | 1420 | 15/16/23 | 0.5 | **Clayey SILT with Sand** - dark brown [7.5YR 3/2] hard, moist; fine- to medium-grained. | ml |
| | | | | | | **Sandy SILT** - dark brown [10YR 3/3] hard, moist; fine- to medium-grained sand. | ml |
| 110 | | W-9d110 | 1425 | 19/23/23 | 38.6 | **Clayey Silty SAND** - fine- to medium-grained dark olive brown [2.5Y 3/3], dense moist | ml |

Graphic Log



DEPTH (feet)

Well Diagram



Remarks/Notes: 1) PID Used:

**WAYNE PERRY, INC.**
8281 Commonwealth Avenue
Buena Park, California 90621
(714) 826-0352
www.wpinc.com

# Log of Boring/Well W-9

PROJECT: *Sawyer Petroleum*

PROJECT NO.: *06 202*

LOCATION: *14117 AETNA ST., VAN NUYS, CA*

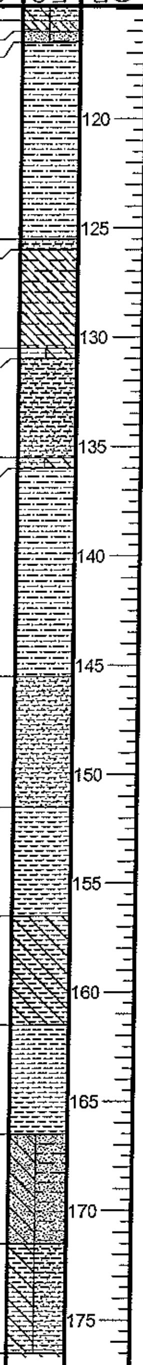
DATE BEGAN: *9/18/06*

FINISHED: *9/29/06*

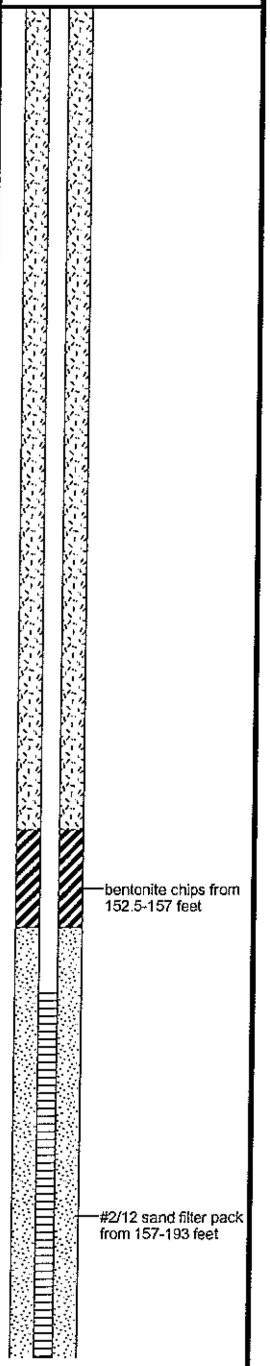
This log is a representation of subsurface conditions at the time and place of drilling. With the passage of time or at any other location, there may be consequential changes in conditions.

| DEPTH (feet) | Samples | Sample I D | Time | Blow Counts (per 6 inches) | PID/LEL (ppm/%) | Geologic Description | Soil Class |
|---|---|---|---|---|---|---|---|
| | | W-9d115 | 1500 | 14/16/20 | 11.1 | **SILT with Clay and Sand** - dark brown [10YR 3/3], hard, moist; fine- to medium-grained sand.<br>**SAND with Silt** - fine- to medium-grained, gray [5Y 3/1], dense, moist. | ml<br>sp |
| 120 | | W-9d120 | 1508 | 38/50 | 2 5 | **Silty SAND** - fine- to medium-grained dark gray [2 5Y 4/1] dense, moist<br>dark olive brown [2 5Y 3/3] very dense. | sm |
| 125 | | W-9d125 | 1518 | 23/25/30 | 5 1 | **Sandy SILT** - dark olive brown [2 5Y 3/3] hard moist.<br>**Silty CLAY** - dark brown [10YR 3/3] hard moist; trace fine- to medium-grained sand | ml<br>cl |
| 130 | | W-9d130 | 1540 | 20/23/25 | 1.5 | **SILT with Clay** - very dark grayish brown [10YR 3/2], hard moist; trace fine- to medium-grained sand.<br>**Sandy SILT** - very dark grayish brown [2.5Y 3/2] hard, moist; fine- to medium-grained sand. | ml<br>ml |
| 135 | | W-9d135 | 0841 | 35/50 | 40.2 | **Sandy SILT with Clay** - dark brown [10YR 3/3] hard, moist; fine- to medium-grained sand.<br>**Silty SAND** - fine- to medium-grained dark brown [10YR 3/3], very dense, moist; no recovery sample at 140 feet | ml<br>sm |
| 140 | | | | | | | |
| 145 | | W-9d145 | 0927 | 51 | 73 9 | **Sandy SILT** - dark olive brown [2 5Y 3/3], hard, moist; fine- to medium-grained sand | ml |
| 150 | | W-9d150 | 0953 | 20/20/25 | 0.0 | **SILT** - very dark grayish brown [2 5Y 3/2], hard, moist; trace fine- to medium-grained sand; trace clay | ml |
| 155 | | W-9d155 | 1009 | 15/19/23 | 0.5 | **Clayey SILT** - dark olive brown [2 5Y 3/3] hard moist; trace fine- to medium-grained sand. | ml |
| 160 | | W-9d160 | 1021 | 10/12/13 | 0.1 | **SILT** - very dark grayish brown [2 5Y 3/2], very stiff, moist; trace fine- to medium-grained sand; trace amount of fine gravel | ml |
| 165 | | W-9d165 | 1047 | 20/29/20 | 0.7 | **Clayey Sandy SILT** - very dark grayish brown [2.5Y 3/2] hard moist; fine- to medium-grained | ml |
| ▽ 170 | | W-9d170 | 1106 | 13/15/20 | 0.0 | **Clayey SILT with Sand** - dark olive brown [2.5Y 3/3], hard, saturated; fine- to medium-grained sand | ml |
| 175 | | | | | | | |

Graphic Log



Well Diagram



Remarks/Notes: 1) PID Used:

**WAYNE PERRY, INC.**
8281 Commonwealth Avenue
Buena Park, California 90621
(714) 826-0352
www.wpinc.com

# Log of Boring/Well W-9

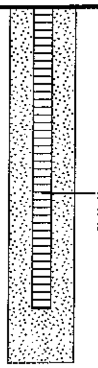
PROJECT: *Sawyer Petroleum*

PROJECT NO.: *06 202*

LOCATION: *14117 AETNA ST., VAN NUYS, CA*

DATE BEGAN: *9/18/06* FINISHED: *9/29/06*

This log is a representation of subsurface conditions at the time and place of drilling. With the passage of time or at any other location, there may be consequential changes in conditions

| DEPTH (feet) | Samples | Sample I D | Time | Blow Counts (per 6 inches) | PID/LEL (ppm/%) | Geologic Description | Soil Class | Graphic Log | DEPTH (feet) | Well Diagram |
|---|---|---|---|---|---|---|---|---|---|---|
| | | W-9d175 | 1124 | 20/23/25 | 0.1 | **Clayey SILT** - dark olive brown [2 5Y 3/3], hard saturated; trace fine- to medium-grained sand | ml | | |  |
| 180 | | W-9d180 | 1134 | 11/13/15 | 0.0 | **Silty SAND** - fine- to medium-grained, dark yellowish brown [10YR 3/6]. dense moist | sm | | 180 | |
| 185 | | W-9d185 | 1146 | 17/19/23 | 135 | **Clayey SILT** - brown [10YR 4/3], hard moist; trace fine- to medium-grained sand | ml | | 185 | screened (0.02 inch slot) 4 inch dia SCH 80 PVC from 160-190 5 feet |
| 190 | | W-9d190 | 1154 | 15/19/24 | 137 | **Sandy SILT** - dark olive brown [2.5Y 3/3] hard moist. | ml | | 190 | |
| 195 | | | | | | Bottom at 193 feet | | | 195 | |
| 200 | | | | | | | | | 200 | |
| 205 | | | | | | | | | 205 | |
| 210 | | | | | | | | | 210 | |
| 215 | | | | | | | | | 215 | |
| 220 | | | | | | | | | 220 | |
| 225 | | | | | | | | | 225 | |
| 230 | | | | | | | | | 230 | |
| 235 | | | | | | | | | 235 | |

Remarks/Notes: 1) PID Used:

**WAYNE PERRY, INC.**
8281 Commonwealth Avenue
Buena Park, California 90621
(714) 826-0352
www.wpinc.com

# Log of Boring/Well W-10

PROJECT: *Sawyer Petroleum*

SURFACE ELEVATION: *Not Measured*

LOCATION: *14117 AETNA ST., VAN NUYS, CA*

TOTAL DEPTH: *191 5 feet*

BORING DIAMETER: *10 inches*

PROJECT NO.: *06.202*

DEPTH TO FIRST SATURATION: *172.5 feet*

DATE BEGAN: *9/29/06* FINISHED: *10/4/06*

TOP OF WELL CASING ELEVATION: *N/A*

DRILLING COMPANY: *Water Development Corporation*

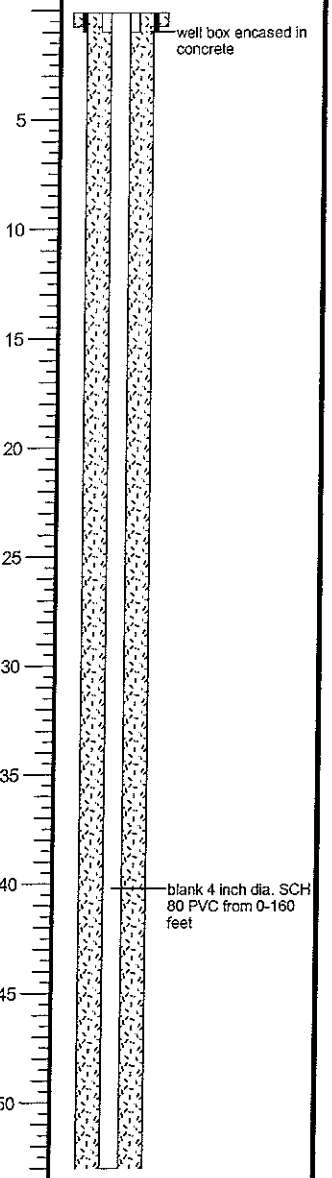
STATIC GW ELEVATION: DATE: *N/A*

DRILLING METHOD: *Hollow-Stem Auger*

LOGGED BY: *E. Kuhn* CHECKED BY: *D. Henry*

This log is a representation of subsurface conditions at the time and place of drilling. With the passage of time or at any other location, there may be consequential changes in conditions

| DEPTH (feet) | Sample I.D | Time | Blow Counts (per 6 inches) | PID/LEL (ppm/%) | Geologic Description | Soil Class |
|---|---|---|---|---|---|---|
| | | | | | **AIRKNIFED TO 7 FEET** | |
| 5 | | | | | | |
| 10 | | | | | **Clayey Sandy SILT** - dark yellowish brown [10YR 3/4], very stiff, moist; fine- to medium-grained sand; trace amount of fine gravel | ml |
| | W-10d10 | 0927 | 7/7/10 | 0.0 | **Silty SAND** - fine- to medium-grained dark brown [10YR 3/3]. dense moist; trace amount of fine gravel | sm |
| 15 | W-10d15 | 0936 | 9/15/15 | 0 0 | | |
| 20 | | | | | dark yellowish brown [10YR 3/4]. | |
| | W-10d20 | 0944 | 19/20/22 | 0.0 | **Clayey Silty SAND** - fine- to medium-grained dark brown [10YR 3/3], dense. moist. | sm |
| 25 | W-10d25 | 0951 | 20/18/20 | 0.0 | **Silty SAND** - fine- to medium-grained, dark yellowish brown [10YR 3/4] dense. moist | sm |
| 30 | W-10d30 | 0958 | 17/18/19 | 0 2 | **Clayey SILT** - very dark grayish brown [10YR 3/2], hard moist; trace fine- medium-grained sand; | ml<br>sm |
| 35 | W-10d35 | 1008 | 13/15/15 | 0 0 | **Clayey Silty SAND** - fine- to medium-grained dark brown [10YR 3/3] dense moist; trace amount of fine gravel.<br>**Silty SAND** - fine- to medium-grained, dark brown [7 5YR 3/4], dense. moist; trace amount of fine gravel. | ml<br>ml |
| 40 | W-10d40 | 1018 | 13/16/18 | 0.0 | **Clayey Sandy SILT** - dark brown [10YR 3/3], very stiff, moist; fine- to medium-grained; trace amount of fine gravel. | ml |
| 45 | W-10d45 | 1028 | 13/15/15 | 0.0 | **Silty SAND** - fine- to medium-grained, dark yellowish brown [10YR 3/4] dense. moist; trace amount of fine gravel.<br>**Clayey Silty SAND** - fine- to coarse-grained. dark brown [10YR 3/3], dense, moist. | sm<br>sm |
| 50 | W-10d50 | 1055 | 21/28/35 | 35.8 | **Silty SAND** - fine- to medium-grained. dark olive brown [2.5Y 3/3], dense, moist;<br>dark yellowish brown [10YR 3/6], very dense trace amount of fine and coarse gravel; | |



Remarks/Notes: 1) PID Used:

**WAYNE PERRY, INC.**
8281 Commonwealth Avenue
Buena Park, California 90621
(714) 826-0352
www.wpinc.com

# Log of Boring/Well W-10

PROJECT: *Sawyer Petroleum*

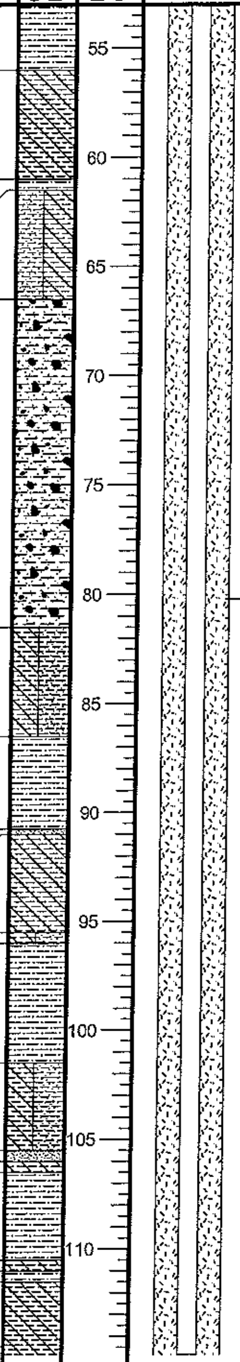
PROJECT NO.: *06 202*

LOCATION: *14117 AETNA ST., VAN NUYS, CA*

DATE BEGAN: *9/29/06* FINISHED: *10/4/06*

This log is a representation of subsurface conditions at the time and place of drilling. With the passage of time or at any other location, there may be consequential changes in conditions.

| DEPTH (feet) | Samples | Sample I D | Time | Blow Counts (per 6 inches) | PID/LEL (ppm/%) | Geologic Description | Soil Class | Graphic Log | DEPTH (feet) | Well Diagram |
|---|---|---|---|---|---|---|---|---|---|---|
| 55 | | | | | | dark olive brown [2.5Y 3/3]. | | | 55 | |
| | | W-10d55 | 1108 | 20/25/20 | 18.5 | **Clayey SILT** - dark olive brown [2 5Y 3/3] hard. moist; trace fine- to medium-grained sand | ml | | | |
| 60 | | W-10d60 | 1115 | 15/15/30 | 2.1 | **Silty SAND** - fine- to medium-grained dark olive brown [2.5Y 3/3], dense, moist. | sm | | 60 | |
| | | | | | | **Sandy SILT with Clay** - dark brown [10YR 3/3] hard moist; fine- to medium-grained sand. | ml | | | |
| 65 | | W-10d65 | 1336 | 15/15/30 | 3.5 | **Silty SAND with Gravel** - fine- to coarse-grained dark olive brown [2 5Y 3/3] dense moist; | sm | | 65 | |
| 70 | | W-10d70 | 1352 | 23/25/27 | 21 7 | | | | 70 | |
| 75 | | | | | | no recovered sample at 75 feet | | | 75 | |
| 80 | | W-10d80 | 1401 | 18/20/20 | 10.4 | **Clayey Silty SAND** - fine- to medium-grained, dark olive brown [2 5Y 3/3] dense. moist; trace amount of fine gravel. | sm | | 80 | neat cement from 1-151 feet |
| 85 | | W-10d85 | 1411 | 15/18/23 | 7.1 | **Silty SAND** - fine- to medium-grained, dark grayish brown [10YR 4/2] dense. moist; trace clay; | sm | | 85 | |
| 90 | | W-10d90 | 1421 | 19/20/20 | 10 7 | **SAND** - fine- to medium-grained, grayish brown [10YR 5/2], dense, moist. | sp | | 90 | |
| | | | | | | **Clayey SILT** - olive brown [2 5Y 4/3], hard moist; trace amount of fine gravel | ml | | | |
| 95 | | W-10d95 | 1438 | 16/19/23 | 21.7 | **Clayey Silty SAND** - fine- to medium-grained, dark olive brown [2.5Y 3/3], dense, moist; trace amount of fine gravel. | ml | | 95 | |
| | | | | | | **Silty SAND** - fine- to medium-grained olive brown [2.5Y 4/4], dense. moist | sm | | | |
| 100 | | W-10d100 | 1454 | 20/20/23 | 4.4 | **Clayey SILT with Sand** - dark olive brown [2.5Y 3/3], hard. moist; fine - to medium-grained sand; trace amount of fine gravel | ml | | 100 | |
| 105 | | W-10d105 | 1510 | 19/23/27 | 9.7 | **SAND** - trace amount of fine gravel. | sp | | 105 | |
| | | | | | | **Clayey SILT** - dark olive brown [2 5Y 3/3], hard, moist; trace fine- to medium-grained; trace amount of fine gravel. | ml | | | |
| | | | | | | | sm | | | |
| 110 | | W-10d110 | 1524 | 25/27/32 | 28.3 | **Silty SAND** - fine- to medium-grained, olive brown [2.5Y 4/4] dense. moist; trace amount of fine gravel. | ml<br>sm<br>ml | | 110 | |



Remarks/Notes: 1) PID Used:

**WAYNE PERRY, INC.**
8281 Commonwealth Avenue
Buena Park, California 90621
(714) 826-0352
www.wpinc.com

# Log of Boring/Well W-10

PROJECT: *Sawyer Petroleum*

PROJECT NO.: *06 202*

LOCATION: *14117 AETNA ST., VAN NUYS, CA*

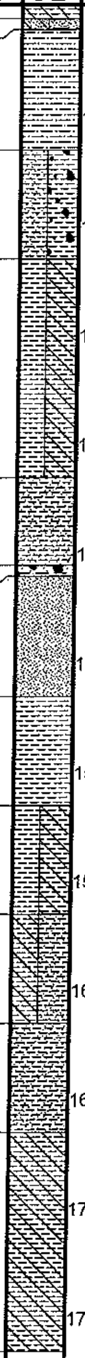
DATE BEGAN: *9/29/06* FINISHED: *10/4/06*

This log is a representation of subsurface conditions at the time and place of drilling. With the passage of time or at any other location, there may be consequential changes in conditions.

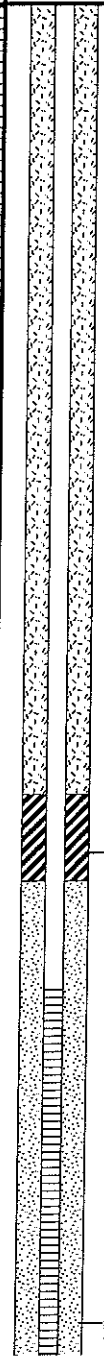
| Sample I D. | Time | Blow Counts (per 6 inches) | PID/LEL (ppm/%) |
|---|---|---|---|
| W-10d115 | 0818 | 21/15 | 19 7 |
| W-10d120 | 0832 | 19/20/23 | 21.5 |
| W-10d125 | 0844 | 20/23/20 | 2.6 |
| W-10d135 | 1408 | 20/20/25 | 5.3 |
| W-10d140 | 1431 | 52 | 4.1 |
| W-10d145 | 1449 | 25/27/31 | 6.5 |
| W-10d150 | 1512 | 25/28/30 | 2.8 |
| W-10d155 | 0812 | 20/25/30 | 1.6 |
| W-10d160 | 0835 | 20/19/27 | 2.9 |
| W-10d165 | 0855 | 20/26/28 | 0.3 |
| W-10d170 | 0907 | 20/23/26 | 0 5 |

| Geologic Description | Soil Class |
|---|---|
| **Clayey SILT** - very dark grayish brown [2 5Y 3/2] hard, moist; trace fine- to medium-grained sand. | ml |
| **Silty SAND** - fine- to coarse-grained dark olive brown [2.5Y 3/3], very dense, moist. | sm |
| **Clayey SILT** - very dark grayish brown [2 5Y 3/2] hard, moist; trace fine- to medium-grained sand. | |
| **Clayey Sandy SILT** - dark olive brown [2 5Y 3/3] hard, moist; fine- to medium-grained sand; trace amount of fine gravel. | sp |
| **Silty SAND** - fine- to coarse-grained, dark yellowish brown [10YR 4/6] dense moist; trace amount of fine gravel. | |
| **SAND with Silt and gravel** - fine- to coarse-grained, olive brown [2 5Y 4/4] dense moist; fine gravel. | ml |
| **SILT with Clay** - dark olive brown [2 5Y 3/3], hard, moist; trace fine- to medium-grained sand; trace amount of fine gravel; no recovered sample at 130 feet | |
| **Sandy SILT** - dark brown [10YR 3/3] hard moist; fine- to medium-grained sand; trace amount of fine gravel; trace clay | ml |
| **Silty SAND with Gravel** - fine- to coarse-grained, dark olive brown [2 5Y 3/3] very dense, moist; fine and coarse gravel. | sm<br>sp |
| **SAND** - fine- to coarse-grained, light brownish gray [2.5Y 6/2], very dense moist; trace silt; trace amount of fine gravel. | |
| **SILT** - dark olive brown [2 5Y 3/3], hard moist; trace fine- to medium-grained sand | ml |
| **SILT with Clay** - dark olive brown [2 5Y 3/3] very dense moist; trace fine- to medium-grained | ml |
| **Clayey Silty SAND** - fine- to medium-grained, very dark grayish brown [2.5Y 3/2], hard, moist | sm |
| **Sandy SILT** - dark olive brown [2 5Y 3/3], hard moist; fine to medium-grained sand; trace clay | ml |
| **Clayey SILT** - dark olive brown [2.5Y 3/3] hard moist; | ml |
| very moist trace amount of fine gravel; | |
| trace fine- to medium-grained sand | |

Graphic Log



Well Diagram



bentonite chips from 151-155 feet

#2/12 sand filter pack from 155-191 5 feet

Remarks/Notes: 1) PID Used:

**WAYNE PERRY, INC.**
8281 Commonwealth Avenue
Buena Park, California 90621
(714) 826-0352
www.wpinc.com

# Log of Boring/Well W-10

PROJECT: *Sawyer Petroleum*

PROJECT NO.: *06.202*

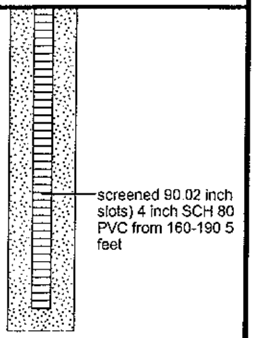
LOCATION: *14117 AETNA ST., VAN NUYS, CA*

DATE BEGAN: *9/29/06* FINISHED: *10/4/06*

This log is a representation of subsurface conditions at the time and place of drilling. With the passage of time or at any other location, there may be consequential changes in conditions.

| DEPTH (feet) | Samples | Sample I D | Time | Blow Counts (per 6 inches) | PID/LEL (ppm/%) | Geologic Description | Soil Class | Graphic Log | DEPTH (feet) |
|---|---|---|---|---|---|---|---|---|---|
|  |  | W-10d175 | 0921 | 23/26/27 | 0.2 | **SILT** - dark olive brown [2 5Y 3/3]. hard. moist; trace clay | ml |  |  |
| 180 | ☒ | W-10d180 | 1013 | 25/25/30 | 0.0 | **SILT with Clay** - dark olive brown [2 5Y 3/3] hard moist | ml |  | 180 |
| 185 | ☒ | W-10d185 | 1038 | 20/23/31 | 0.0 | **Sandy SILT** - dark brown [10YR 3/3] very hard. moist; fine- to medium-grained sand; trace clay; trace amount of fine gravel | ml |  | 185 |
| 190 | ☒ | W-10d190 | 1058 | 23/25/30 | 0.0 | Bottom at 191 5 feet |  |  | 190 |
| 195 |  |  |  |  |  |  |  |  | 195 |
| 200 |  |  |  |  |  |  |  |  | 200 |
| 205 |  |  |  |  |  |  |  |  | 205 |
| 210 |  |  |  |  |  |  |  |  | 210 |
| 215 |  |  |  |  |  |  |  |  | 215 |
| 220 |  |  |  |  |  |  |  |  | 220 |
| 225 |  |  |  |  |  |  |  |  | 225 |
| 230 |  |  |  |  |  |  |  |  | 230 |
| 235 |  |  |  |  |  |  |  |  | 235 |

Well Diagram



Remarks/Notes: 1) PID Used:

Page
4 of 4

**WAYNE PERRY, INC.**
8281 Commonwealth Avenue
Buena Park, California 90621
(714) 826-0352
www.wpinc.com

# Log of Boring/Well SVE-4

PROJECT: *Sawyer Petroleum*

SURFACE ELEVATION: *Not Measured*

LOCATION: *14117 AETNA ST. VAN NUYS. CA*

TOTAL DEPTH: *155 feet*

BORING DIAMETER: *8/12*

PROJECT NO.: *06 202*

DEPTH TO FIRST SATURATION: *N/A*

DATE BEGAN: *8/8/07* FINISHED: *8/8/07*

TOP OF WELL CASING ELEVATION: *N/A*

DRILLING COMPANY: *Test America*

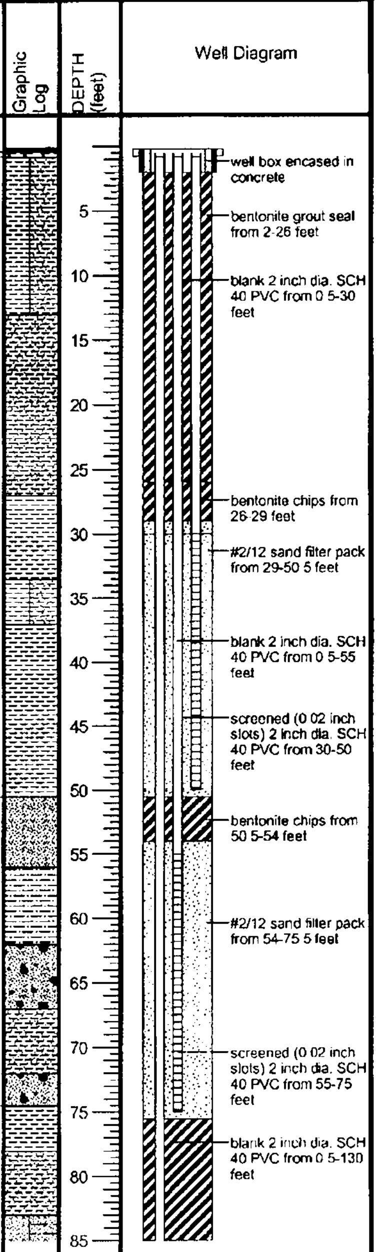
STATIC GW ELEVATION: DATE: *N/A*

DRILLING METHOD: *Hollow-Stem Auger*

LOGGED BY: *A. Dollemore* CHECKED BY: *D. Henry*

This log is a representation of subsurface conditions at the time and place of drilling. With the passage of time or at any other location, there may be consequential changes in conditions

| DEPTH (feet) | Samples | Sample ID | Time | Blow Counts (per 6 inches) | PID/LEL (ppm/%) | Geologic Description | Soil Class |
|---|---|---|---|---|---|---|---|
| | | | | | | **ASPHALT**, 4 inches.<br>**AGGREGATE BASE**, 4 inches.<br>**SILT with Sand** - very dark gray [5Y 3/1] stiff moist; with fine-grained sand; | ml |
| 5 | | | | | | | |
| 10 | | SVE-4d10 | 1330 | 7/8/10 | 1.8 | color change at 10 feet to very dark greenish gray [4/10Y]. | |
| 15 | | SVE-4d15 | 1337 | 8/11/13 | 2 8 | **Sandy SILT** - dark greenish gray [4/5GY] very stiff moist; with fine-grained sand; | ml |
| 20 | | SVE-4d20 | 1346 | 9/11/14 | 0 0 | | |
| 25 | | SVE-4d25 | 1353 | 8/9/12 | 0 0 | color change at 25 feet to brown [10YR 5/3] | |
| 30 | | SVE-4d30 | 1402 | 7/10/12 | 0 0 | **SILT** - greenish gray [5/10Y] very stiff moist | ml |
| 35 | | SVE-4d35 | 1411 | 11/13/14 | 0.0 | **SILT with Sand** - olive [5Y 4/3] very stiff moist; with fine-grained sand. | ml |
| 40 | | SVE-4d40 | 1420 | 10/12/16 | 11 1 | **SILT** - greenish gray [5/10Y]. very stiff. moist; odor; | ml |
| 45 | | SVE-4d45 | 1423 | 13/14/18 | 13 0 | color change at 45 feet to olive gray [5Y 4/2]; | |
| 50 | | SVE-4d50 | 1438 | 12/12/17 | 31 5 | color change at 50 feet to olive [5Y 5/4]<br>**SAND** - fine- to medium-grained, light olive brown [2 5Y 5/4] dense moist; solvent odor | sp |
| 55 | | SVE-4d55 | 1445 | 13/15/18 | 89 7 | | |
| 60 | | SVE-4d60 | 1153 | 14/14/18 | 181.3 | **Silty SAND** - fine-grained, light olive brown [2 5Y 5/4] dense moist; solvent odor | sm |
| 65 | | SVE-4d65 | 1500 | 15/16/20 | 987.0 | **Gravelly SAND** - fine- to coarse-grained, with fine and coarse gravel, light brownish gray [2 5Y 6/2], dense, moist; strong solvent odor; no Encore | sp |
| 70 | | SVE-4d70 | 1508 | 12/14/20 | 203.0 | **Sandy SILT** - light olive brown [5Y 5/4]. hard moist; with fine-grained sand; solvent odor | ml |
| 75 | | SVE-4d75 | 1518 | 17/20/22 | 181 0 | **Gravelly SAND** - fine- to coarse-grained, with fine and coarse gravel, grayish brown [2 5Y 5/2] dense, moist; solvent odor. | sp<br>ml |
| 80 | | SVE-4d80 | 1530 | 15/19/21 | 37 7 | **SILT** - light yellowish brown [2 5Y 6/4] hard moist; solvent odor<br>**Sandy SILT** - light olive brown [2 5Y 5/6] hard moist; with fine-grained sand. | ml |
| 85 | | | | | | | sp |



Remarks/Notes: 1) PID Used:

**WAYNE PERRY, INC.**
8281 Commonwealth Avenue
Buena Park, California 90621
(714) 826-0352
www.wpinc.com

# Log of Boring/Well SVE-4

PROJECT: *Sawyer Petroleum*

PROJECT NO : *06 202*

LOCATION: *14117 AETNA ST., VAN NUYS, CA*

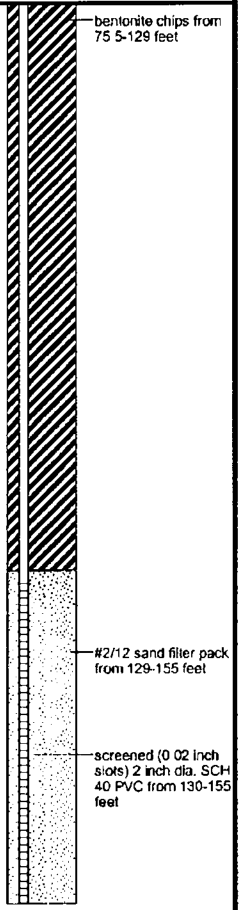
DATE BEGAN: *8/8/07*

FINISHED: *8/8/07*

This log is a representation of subsurface conditions at the time and place of drilling. With the passage of time or at any other location there may be consequential changes in conditions

| DEPTH (feet) | Sample I D | Time | Blow Counts (per 6 inches) | PID/LEL (ppm/%) | Geologic Description | Soil Class |
|---|---|---|---|---|---|---|
| 85 | SVE-4d85 | 1537 | 16/17/24 | 41.8 | **SAND with Silt** - fine-grained olive [5Y 5/3] dense moist; solvent odor | |
| 90 | SVE-4d90 | 1546 | 15/18/25 | 28 9 | **SAND** - fine-grained light gray [5Y 7/1] dense moist; solvent odor; | sp |
| 95 | SVE-4d95 | 1555 | 18/19/28 | 9 7 | with some silt at 95 feet | |
| 100 | SVE-4d100 | 1603 | 15/18/20 | 10 3 | **Silty SAND** - fine-grained, olive gray [5Y 4/2] dense moist; solvent odor | sm |
| 105 | SVE-4d105 | 1612 | 15/20/25 | 2 8 | **Sandy SILT** - dark yellowish brown [10YR 4/4] hard, moist; with fine- to coarse-grained sand<br>**SILT with Clay** - olive [5Y 5/3] hard moist; | ml<br>ml |
| 110 | SVE-4d110 | 1620 | 14/20/20 | 0 7 | | |
| 115 | SVE-4d115 | 1629 | 21/20/23 | 0 0 | color change at 115 feet to light olive brown [2 5Y 5/4] trace fine-grained sand; | |
| 120 | SVE-4d120 | 1637 | 13/17/20 | | no recovery at 120 feet | |
| 125 | SVE-4d125 | 1647 | 12/16/19 | 1 7 | **SILT** - olive [5Y 4/4] hard moist; | ml |
| 130 | SVE-4d130 | 1700 | 15/16/20 | 2 1 | iron oxide mottling at 130 feet | |
| 135 | SVE-4d135 | 1708 | 13/16/23 | 0 0 | **Sandy SILT** - olive [5Y 4/4], hard moist; with fine- to medium-grained sand | ml |
| 140 | SVE-4d140 | 1715 | 11/12/17 | 0 8 | **SAND with Gravel** - fine- to coarse-grained pale olive [5Y 6/3], medium dense moist; with fine and coarse gravel. | sp |
| 145 | SVE-4d145 | 1723 | 14/15/16 | 3 7 | **SILT** - olive [5Y 5/3] hard moist: trace fine-grained sand | ml |
| 150 | SVE-4d150 | 1731 | 15/17/20 | 2 8 | | |
| 155 | SVE-4d155 | 1740 | 14/15/15 | 3 1 | Bottom at 155 feet | |

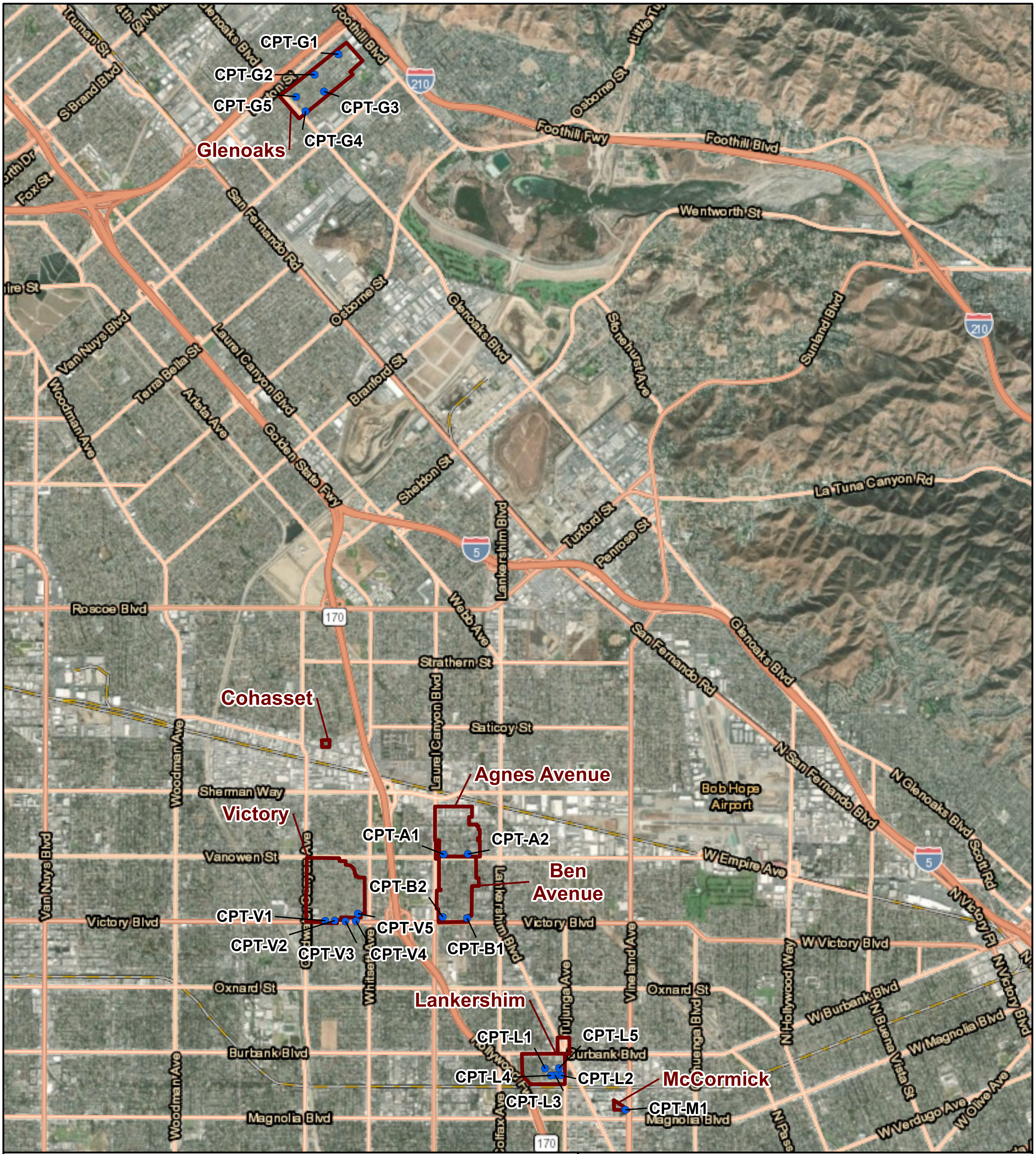
Well Diagram



Remarks/Notes: 1) PID Used:

# APPENDIX C

## CPT Data from Victory Green Stormwater Infrastructure Project



**Legend**

● Approximate Location of Cone Penetration Test (CPT)

▭ Approximate Site Boundary

N

0 1 Miles

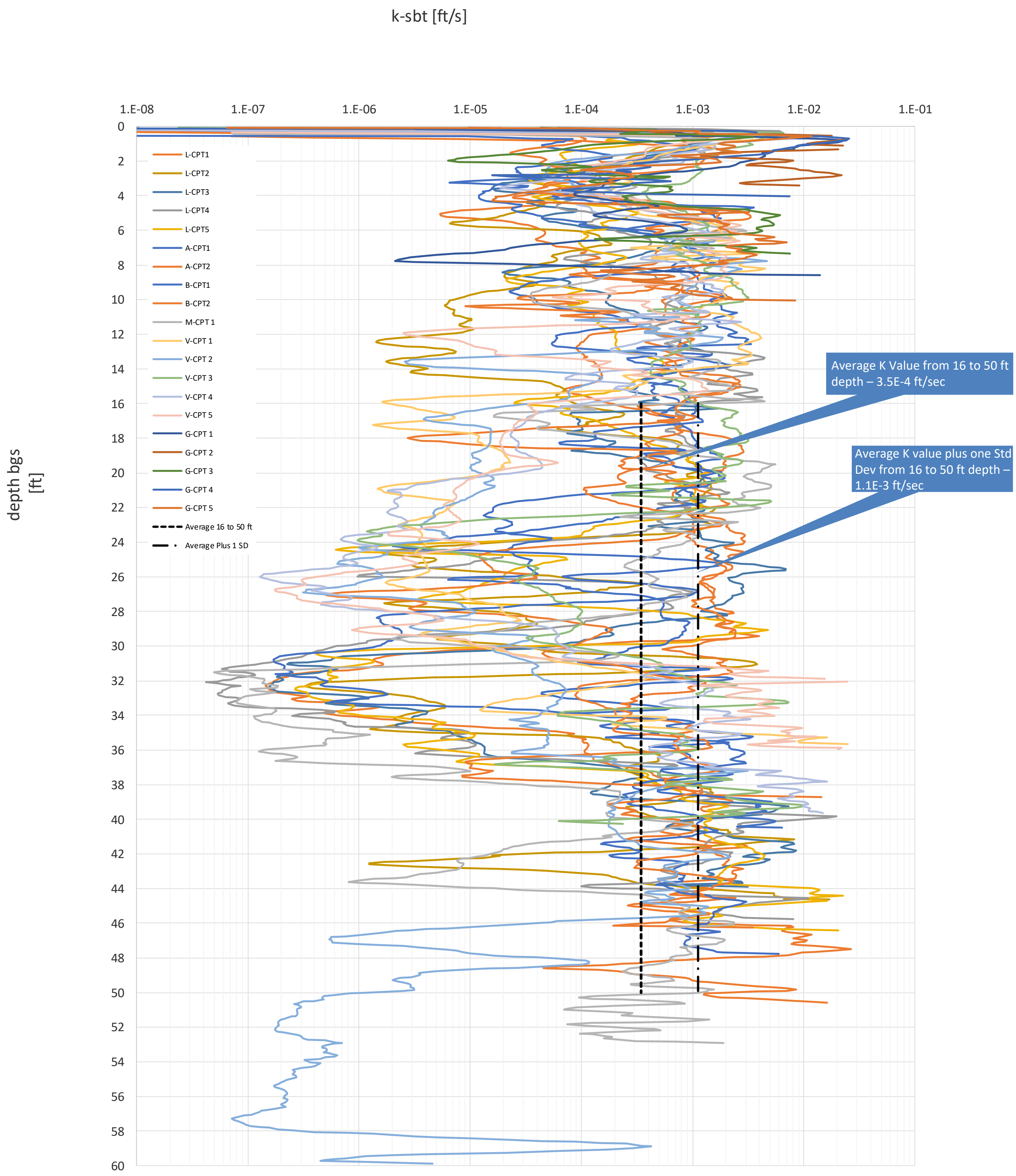
## Compiled Site Location and CPT Exploration Map
## TOS-SN97, Agnes Avenue GSI

Los Angeles, CA 91606

LA Sanitation environment CITY OF LOS ANGELES

Geosyntec consultants

| | | |
|---|---|---|
| Los Angeles | April 2020 | Figure 1 |



Average K Value from 16 to 50 ft depth – 3.5E-4 ft/sec

Average K value plus one Std Dev from 16 to 50 ft depth – 1.1E-3 ft/sec

## CPT Hydraulic Conductivity vs.Depth

| | | |
|---|---|---|
| Los Angeles | April 2020 | **Figure** 4 |

# APPENDIX D

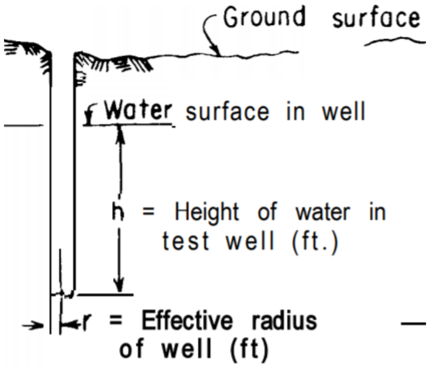
## Drywell Infiltration Capacity Calculation

10/11/2020

# Metro Orange Line Drywell Infiltration Rate Calculation

Geosyntec consultants

| Description | Value | Unit | Equation/Note |
|---|---|---|---|
| **Design input:** | | | |
| Saturated conductivity | 7.6E-04 | ft/sec | Average (16 to 50 ft) |
| | 4.04E-04 | ft/sec | SD (16 to 50 ft) |
| | 3.60E-04 | ft/sec | average minus 1SD (16 to 50 ft) |
| **Drywell design parameters:** | | | |
| Chamber diameter | 4 | ft | $D_c$ |
| Drywell diameter | 4 | ft | $D_d$ |
| *Drywell Radius* | 2 | ft | $r = D_d/2$ |
| Well screen depth | 29 | ft | L |
| Number of drywell | 1 | | |
| **Estimate infiltration rate using USBR Method** | | | |
| *Water Depth* | 29 | ft | $H = L+d_p$ |
| *H/r* | 14.5 | | H/r |
| *Term A* | 1.9 | | $A = 2*\pi*k_{sat}*H^2$ |
| *Term B* | 3.4 | | $B = \ln(H/r+\text{sqrt}(1+(H/r)^2))$ |
| *Term C* | 1.0 | | $C = \text{sqrt}(1+(H/r)^2)/(H/r)$ |
| *Term D* | 0.1 | | D = r/H |
| *Drywell Infiltration Rate* | 0.78 | ft3/sec | $Q_1 = A/(B-C+D)$, per dry well |



$$Q=\frac{\overset{A}{\boxed{2\pi KH^2}}}{\underset{B}{\boxed{\ln\left[\frac{H}{r}+\sqrt{1+\left(\frac{H}{r}\right)^2}\right]}}-\underset{C}{\boxed{\frac{\sqrt{1+(H/r)^2}}{H/r}}}+\underset{D}{\boxed{\frac{1}{H/r}}}}$$

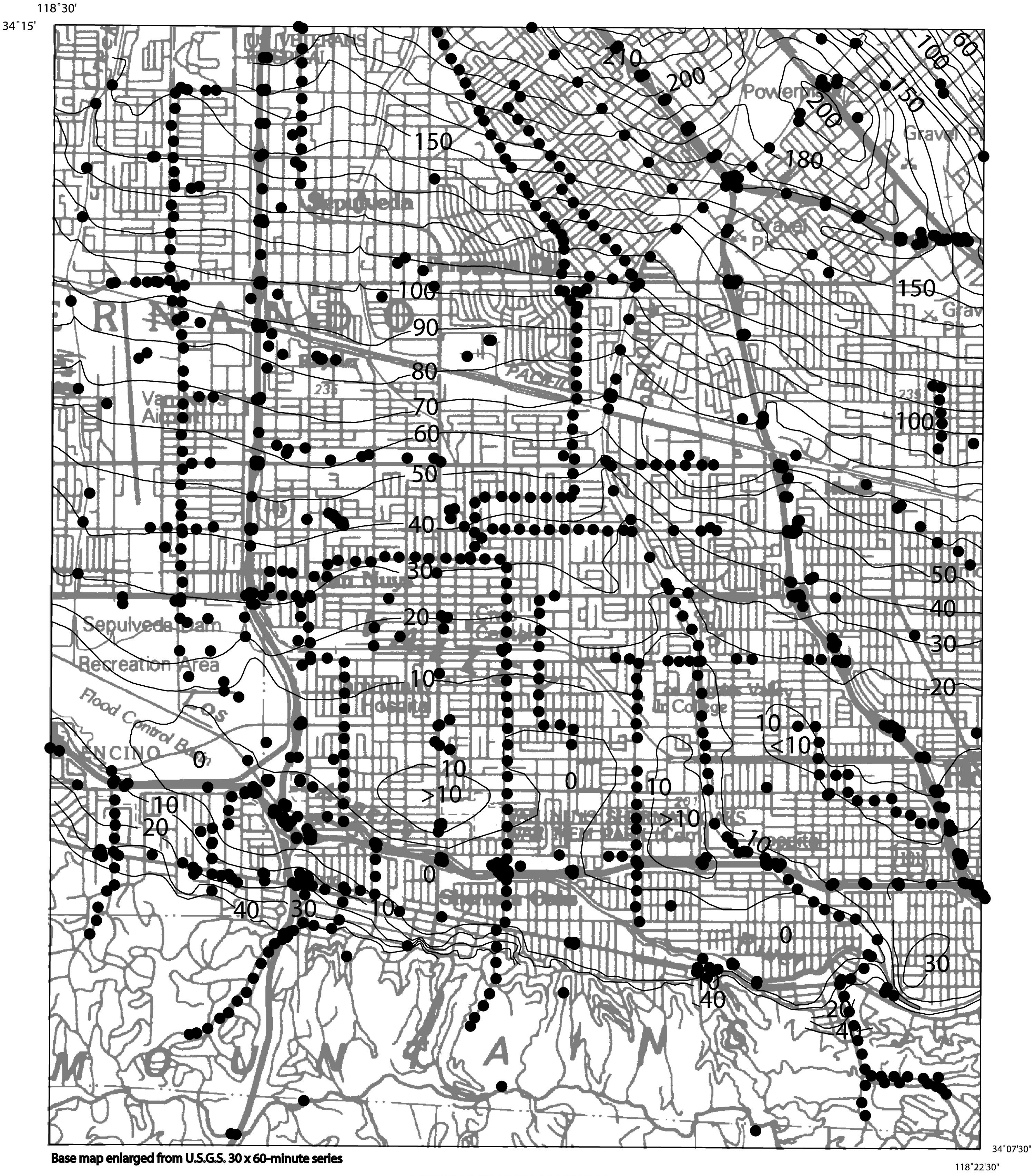
# APPENDIX E

## Plate 1.2 Historically High Ground Water Contours and Borehole Locations

CALIFORNIA GEOLOGICAL SURVEY
MICHAEL REICHLE, ACTING STATE GEOLOGIST

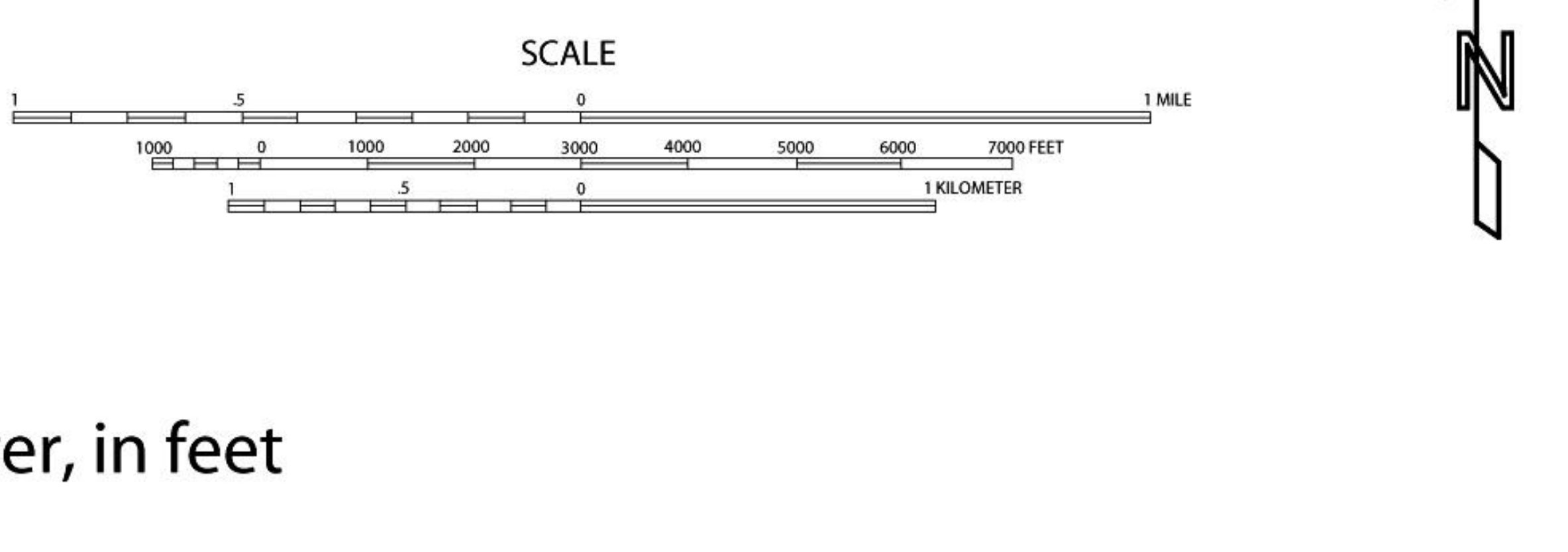
STATE OF CALIFORNIA-ARNOLD SCHWARZENEGGER, GOVERNOR
THE RESOURCES AGENCY-MICHAEL CHRISMAN, SECRETARY
DEPARTMENT OF CONSERVATION-DEBBIE SAREERAM, INTERIM DIRECTOR

**Van Nuys Quadrangle Plate 1.2**
SEISMIC HAZARD ZONE REPORT 008



**Base map enlarged from U.S.G.S. 30 x 60-minute series**

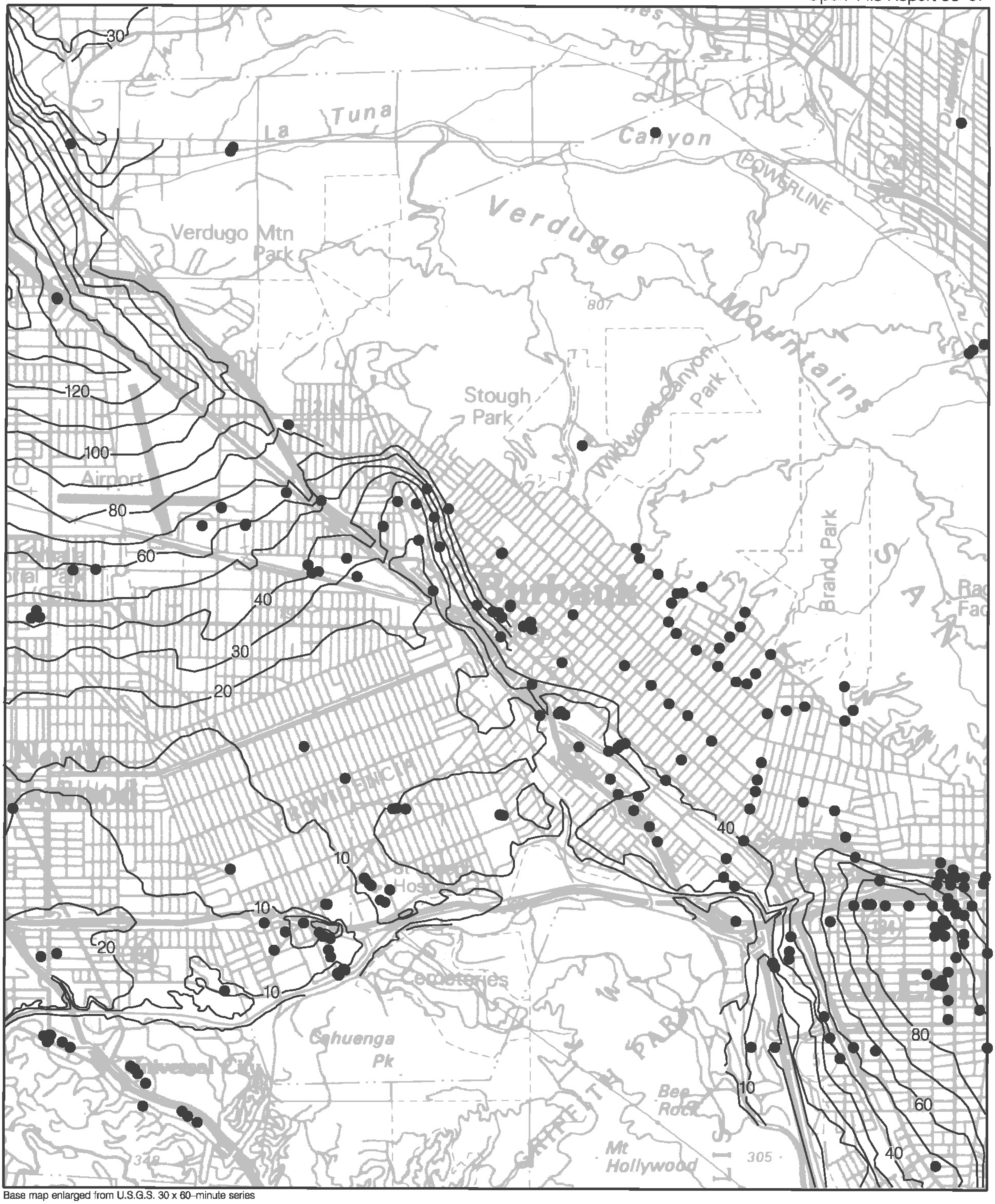
VAN NUYS QUADRANGLE



— 50 — Depth to ground water, in feet

● Geotechnical borings used in liquefaction evaluation

Plate 1.2 Historically High Ground Water Contours and Borehole Locations, Van Nuys 7.5-Minute Quadrangle, California

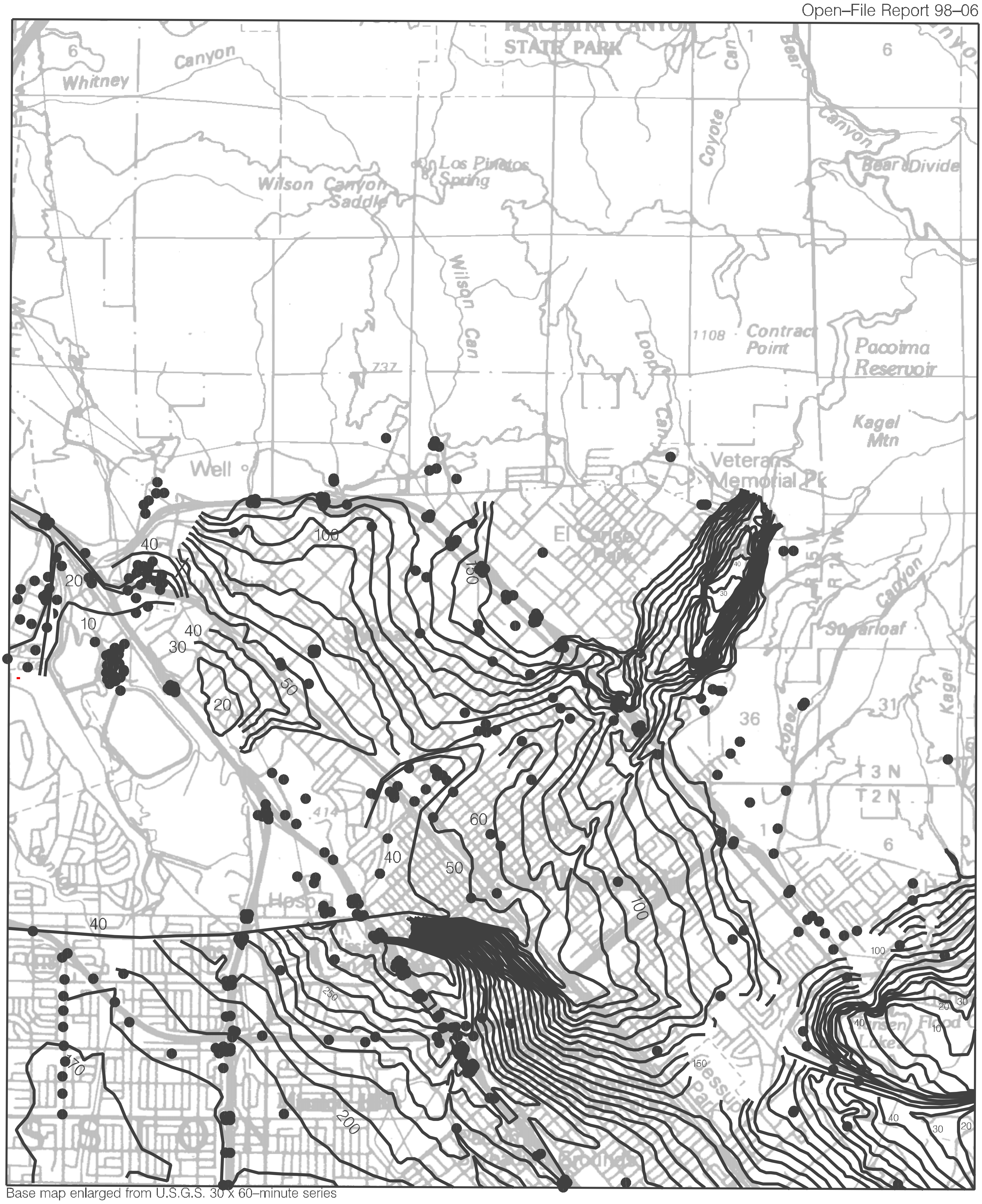


Base map enlarged from U.S.G.S. 30 x 60–minute series

Plate 1.2 Historically Highest Ground Water Contours and Borehole Log Data Locations, Burbank Quadrangle.

| | |
|---|---|
| ● Borehole Site | ~ 30 ~ Depth to ground water in feet |

ONE MILE
SCALE



Base map enlarged from U.S.G.S. 30 x 60–minute series

Plate 1.2 Historically Highest Ground–Water Contours and Borehole Log Data Locations, San Fernando Quadrangle.

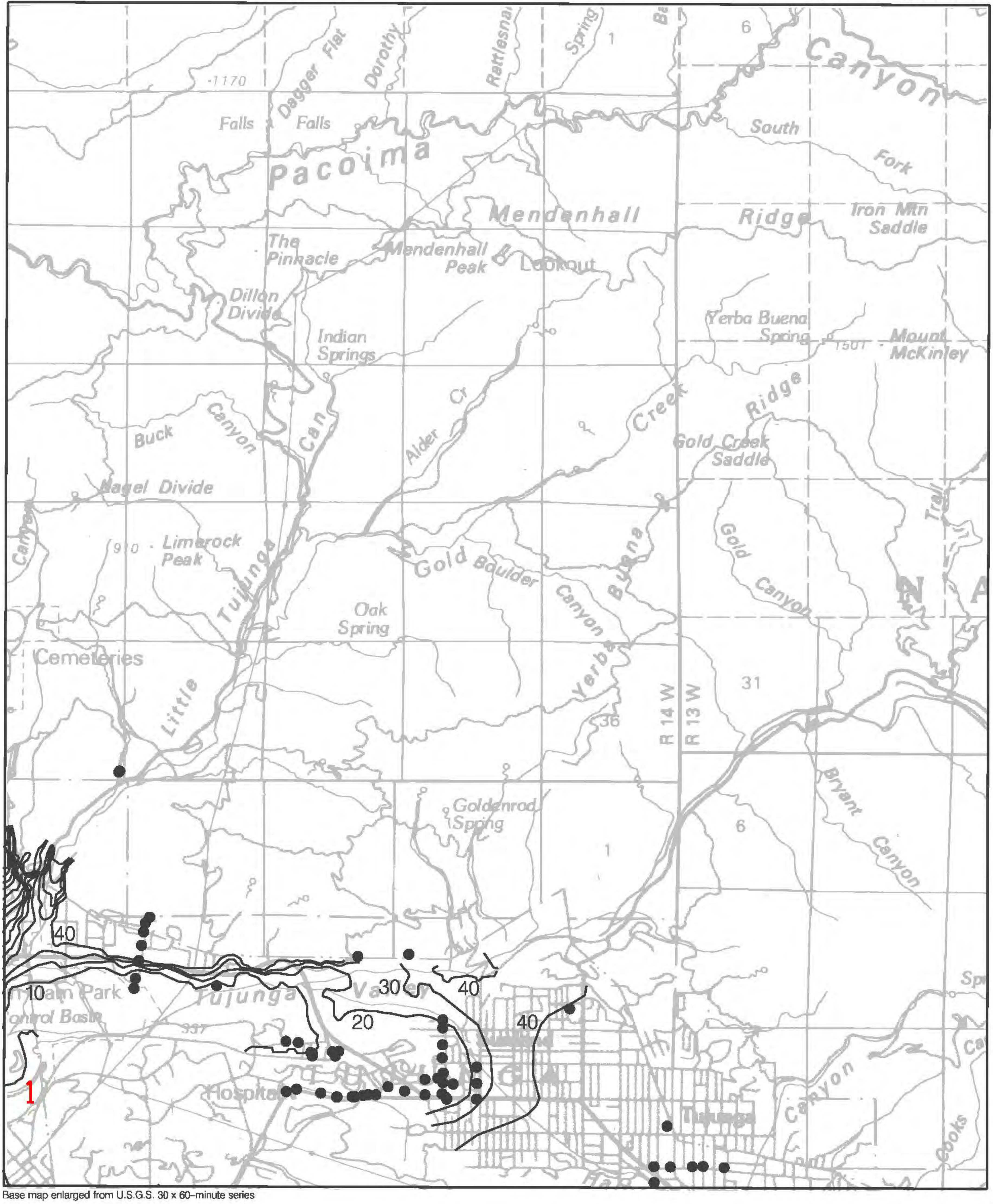
● Borehole Site

30 Depth to ground water in feet

6 Site of historical earthquake–generated liquefaction. See "Areas of Past Liquefaction" discussion in text.

ONE MILE

SCALE



Base map enlarged from U.S.G.S. 30 x 60–minute series

Plate 1.2 Historically Highest Ground Water Contours and Borehole Log Data Locations, Sunland Quadrangle.

● Borehole Site

—30— Depth to ground water in feet

1 Site of historical earthquake–generated liquefaction. See "Areas of Past Liquefaction" discussion in text.

ONE MILE

SCALE

# APPENDIX F

## Metro Orange Line Improvement Sepulveda Station and Grade Separation – 30% Geotechnical Design Memorandum

Wood Environment & Infrastructure Solutions, Inc.
6001 Rickenbacker Road
Los Angeles, CA 90040-3031
USA

T: +1 323.889.5300

**www.woodplc.com**

September 11, 2020
Wood Project 4953-18-0121

Mr. Rob Ball
Mott MacDonald, LLC
1000 Wilshire Boulevard
Suite 400
Los Angeles, California 90017

**Subject: Letter of Transmittal**
**30% Geotechnical Design Memorandum**
**Metro Orange Line Improvement Project**
**Sepulveda Station and Grade Separation**
**Van Nuys District, Los Angeles, California**

Dear Mr. Ball

Please find attached our 30% Geotechnical Design Memorandum (GDM) for your review and comments before we formally submit.

Please call if you have any questions.

Sincerely,

**Wood Environment & Infrastructure Solutions, Inc.**

Jimmy Francisco
Technical Professional 3 - Geotechnical

Perry A. Maljian
Senior Principal Engineer

# Metro Orange Line Improvement

# Sepulveda Station and Grade Separation – 30% Geotechnical Design Memorandum

September 11, 2020

Los Angeles Metro

Mott MacDonald
1000 Wilshire Boulevard
Suite 400
Los Angeles CA 90017
United States of America

T +1 (818) 506 8088
mottmac.com

Los Angeles Metro

# Metro Orange Line Improvement Project
# Sepulveda Station and Grade Separation
# 30% Geotechnical Design Memorandum

September 11, 2020

Los Angeles Metro

# Issue and revision record

| Revision | Date | Originator | Checker | Approver | Description |
|---|---|---|---|---|---|
| 0 | 5/15/2019 | HP/MK | MBH/PM/MK | | IDR |
| 1 | 5/28/2019 | MK/HP | MBH | | Draft for PE Submission |
| 2 | 9/9/2020 | MK/HP | PM | | Draft Responses to Metro Comments |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |

**Document reference:** 381630-WEI-01-XX-RP-GE-0003 |

**Information class: Standard**

# Contents

## Figures

## Tables

# 1 Introduction

## 1.1 General

This 30% Geotechnical Design Memorandum (GDM) has been prepared for the proposed Sepulveda Segment of the Los Angeles County Metropolitan Transportation Authority (Metro) Orange Rapid Bus Transit Line (MOL) Grade Separation project (Project) in the Van Nuys district of the City of Los Angeles, California. The purpose of this report is to provide interpretation of the subsurface soil and groundwater data and perform evaluation of geologic and seismic hazards affecting the project and engineering analyses to provide preliminary recommendations for the proposed structures. It is noted that the preliminary recommendations in this report are based on limited explorations that are commensurate with the objectives of this 30% design. Additional explorations should be performed in future phases of the project to develop more definitive recommendations for final design of the structures.

This evaluation is conducted under contract to Mott MacDonald LLC., by Wood Environment & Infrastructure Solutions, Inc. (Wood). Wood is the lead geotechnical consultant for this project. Earth Mechanics, Inc. (EMI) is performing the evaluation for the bridge structures for review and incorporation into the overall documentation by Wood.

The scope of this study did not include the assessment of general site environmental conditions for the presence of contaminants in the soils and/or groundwater. Additionally, this project team was informed that Metro would be performing that assessment under a separate contract. A 30% geotechnical data report (GDR) was submitted separately that presents the field and laboratory data collected to date for the Project.

## 1.2 Limitations and Basis for Recommendations

The professional services provided have been performed using that degree of care and skill ordinarily exercised, under similar circumstances, by reputable geotechnical consultants practicing in this or similar localities. No other warranty, express or implied, is made as to the professional advice included in this report. This report has been prepared by Wood/EMI for Mott MacDonald LLC., Metro, and their design consultants to be used solely in the preliminary evaluation of the proposed Sepulveda grade separation segment of the Metro Orange Line Improvement Project. This report has not been prepared for use by other parties and may not contain sufficient information for purpose of other parties or other uses.

In developing this GDM, Wood/EMI relied on subsurface information obtained in previous available investigations and available geologic publications. The information provided herein are for the purposes of preliminary (30% design) evaluation of the project segment. Subsurface conditions are, by their nature, uncertain and may vary from those encountered at the locations where visual inspections, borings, surveys, or other explorations were made. Additional explorations will be needed to support the final design phase of the project.

# 2 Project Description and Existing Site Conditions

In order to provide safer and improved operating speeds to the MOL Bus Rapid Transit (BRT) line as well as to meet the forecasted growing demand in ridership, Metro proposes various improvements along the 12.7-mile-long portion of the MOL bus transit alignment between the North Hollywood and Canoga stations. The proposed improvements include grade separations at major streets, minor street closures, and incorporation of four-quadrant gating systems at grade crossings. As an integral component of the comprehensive proposed MOL improvements, the current study will focus on the grade separation at Sepulveda Boulevard. The location of the current study is shown on Figure 1, Site Vicinity Map.

Based on 30% design drawings and profiles provided to Wood the proposed grade separation at Sepulveda Boulevard will be accomplished by constructing an aerial grade-separated guideway that consists of bridge structures and earth fill embankments. The earth fill embankments, which are anticipated to be retained by Mechanically Stabilized Earth (MSE) type retaining walls, are planned to have a maximum height of about 30 feet at both ends of the bridge structures and will have approach ramps at the west and east ends with a maximum slope of 3 percent. The aerial guideway will have a width varying from about 40 feet at its eastern and western termini to about 66 feet at the bridges, and extend from approximately 875 feet west of Sepulveda Boulevard to about 985 feet east of Sepulveda Boulevard, totaling approximately 1,860 feet in length (0.35 mile).

The proposed bridge structures consist of a multi-span aerial station at the Sepulveda Boulevard grade separation Furthermore, the planned grade separation will support conversion of the existing BRT to future light rail transit (LRT) if needed. The loads provided by the structural engineer have considered the maximum load from BRT and LRT, however, the design-builder should confirm the loads during the final design.

The existing MOL alignment is an at-grade roadway paved with asphalt-concrete or portland-cement-concrete dedicated for the BRT. The existing grade along the centerline of the current BRT slopes down from west to east with an elevation difference of 16 feet (Elevation 716 to 700 feet). Numerous underground utilities are currently located under the roadway as shown on the 15% Composite Utility Plans.

# 3 Relevant Geotechnical Data

Subsurface soil and groundwater data were available from previous geotechnical investigations in the project vicinity. Specifically, Wood's predecessor company LeRoy Crandall and Associates (LCA) performed a geotechnical investigation for a nearby site and presented the results in a report dated May 9, 1972 (LCA, 1972). In addition, the Earth Technology Corporation (ETC) performed a limited preliminary engineering study of the Metro Red Line Project and presented the results in a report dated December 10, 1993, which contains results of explorations performed along the Sepulveda Grade Separation segment currently being evaluated. Furthermore, Metro has completed a technical study for the conceptual planning of the Project; the study includes a preliminary geotechnical evaluation conducted by Diaz Yourman & Associates (DYA). The results of DYA's study were summarized in a report dated June 21, 2017. To supplement the prior data, two additional borings and four cone penetration tests (CPTs) were performed as part of this current study (30% design phase). The results of the prior and current field and laboratory testing were presented in the 30% final GDR dated November 8, 2018.

# 4 Geology

## 4.1 Geologic Setting

The planned Sepulveda Grade Separation is located in the south to southeastern portion of the San Fernando Valley. The San Fernando Valley is an east-west trending structural trough approximately 23 miles long (in the north-south direction) and 12 miles wide (in the east-west direction). Regionally, the San Fernando Valley is located in the Transverse Ranges geomorphic province. This province is characterized by east-west trending geologic structures such as the nearby Santa Monica Mountains and the active, east-west trending, San Fernando section of the Sierra Madre fault zone, located approximately 8 miles north of the planned Project. Tectonic deformation in the province is characterized by uplift of the Santa Monica Mountains to the south, the Santa Susana Mountains to the northwest, the San Gabriel Mountains to the northeast, the Simi Hills to the west, and the Verdugo Mountains to the east, all of which are sources of the sediments infilling the valley.

The location of the Project is at an approximate elevation of 700 to 715 feet above mean sea level (AMSL) (NAVD 88), sloping down to the east. The location of the Project in relation to regional topography is shown on Figure 2.

## 4.2 Geologic Materials

Localized fill materials were encountered in some of the previous borings up to a depth of 2½ feet below existing ground surface (bgs) (LeRoy Crandall, 1972, Diaz-Yourman, 2017) in the vicinity of the Project site. Localized fill materials were encountered in one of two exploratory borings currently drilled on the right of way to a depth of 4 feet bgs. The fill soils generally consisted of silty sand. Sand and gravel, reportedly railroad ballast, was also present in one of the prior borings (Earth Technology Corporation, 1993). Deeper fill soils may be present between boring locations.

The fill soils are underlain by Holocene-age alluvial fan deposits (Hitchcock and Wills, 2000). The alluvial deposits consist predominantly of sands and silty sands, and silts and clays with varying amounts of sand. The alluvial deposits encountered are predominantly fine grained in the upper 25 to 35 feet consisting of stiff silts and clay. Below approximately 30 to 35 feet, predominantly dense sand and silty sand with localized trace gravel and rare cobbles were encountered. Below approximately 55 feet some layers of stiff sandy silt and sandy clay are present within the dense sand and silty sand. The general stratigraphy appears to be similar between the borings as shown on Figure 3.

## 4.3 Groundwater

The Project is located in Section 4 of Township 1 North, Range 15 West, within the San Fernando Ground Water Basin (California Department of Water Resources, 2003). According to the Los Angeles Department of Public Works (County of LADPW, 2018), the closest well to the planned Sepulveda Grade Separation is Well 3732A located approximately 150 feet north of the Metro Orange Line right of way and 200 feet east of Sepulveda Boulevard (see Figure 3 for well location). Due to proximity of this well to the project, groundwater data from this well was considered in assessing the groundwater level fluctuations with time.

The most recent ground water measurement recorded for this well was a depth of 96.3 feet bgs (elevation 604.5) measured on September 28, 2008. The historic high for the well was measured at a depth of 58 feet bgs (elevation 642.4) on September 12, 1956 and the historic low was 158.5 feet bgs (elevation 542.3) on October 17, 2000 during the monitoring period of 1956 – 2008 (note there are no readings for 2001 – 2007 and no readings after 2008). Groundwater was measured as high as 80.2 feet bgs (elevation 620.6) on March 25, 2008. Screen depths for Well 3732A were not available on either LA County Public Works or the California Department of Water Resources websites. However, considering the measured historic low groundwater depth of 158.5 feet bgs, it can be inferred that the well casing depth is at least160 feet bgs or more..

Groundwater elevations are plotted against rainfall amounts for the period of 1955 through 2018 on Figure 4. There is no apparent correlation between rainfall and groundwater elevations/depths. This is because groundwater levels are controlled by groundwater pumping throughout the San Fernando Ground Water Basin. Groundwater extraction from the basin was adjudicated in 1976 by the Superior Court for the County of Los Angeles and is heavily regulated and monitored.

Groundwater was also measured in previous boring LPE-10 at a depth of 77.4 feet bgs (elevation 627.6) on October 8, 1993 (Earth Technology Corporation, 1993) and was encountered in boring G-1 at a depth of 67 feet bgs (elevation 637.7) on October 11, 2018 and in boring G-2 at a depth of 67 feet bgs (elevation 636.1) on October 9, 2018.

Groundwater depth in Well 3732A was 142.4 feet bgs (elevation 558.4) on November 4, 1993, compared to groundwater measured in boring LPE-10 (located 335 feet to the southwest) at a depth of 77.4 feet bgs (elevation 627.6) on October 8, 1993. It therefore appears that the groundwater encountered in the borings is a perched condition. As the depth to groundwater was 67 feet in the 2018 boring, similar to the 77 feet depth measured in the 1993 boring, it appears that this perched condition has persisted through the present. Shallower perched groundwater conditions that may exist can be investigated when additional borings are drilled in future phases.

According to the California Division of Mines and Geology (CDMG, 2005), the historic high groundwater level in the area was around 15 feet bgs. This level is based on the 1944 groundwater elevation contours from California State Water Rights Board, 1962. Since that time, excessive pumping caused a regional drawdown of groundwater levels throughout the San Fernando Ground Water Basin. Although groundwater levels have increased since then, they have not recovered to 1940’s levels. Figure 5 shows the groundwater storage capacity of the San Fernando Basin from 1928 through 2015. The upper regulatory storage requirement is significantly lower than the capacity when groundwater levels were at the high of 1944. The lower regulatory limit has only been achieved in 2 years since the adjudication of the water basin of 1976. Based on the goals and past performance for groundwater storage for the basin, groundwater levels are not anticipated to return to historical levels (i.e., 15 feet bgs) due to continued groundwater use during the design life of the Project.

# 5 Geologic and Seismic Hazards

## 5.1 Faults

Numerous faults in Southern California have been previously characterized as active or potentially active. The criteria for these major groups are based on criteria developed by the California Geological Survey (CGS), for the Alquist-Priolo Earthquake Fault Zoning Program (Bryant and Hart, 2007). According to Bryant and Hart, an active fault is one that has had surface displacement within Holocene time (about the last 11,000 years); and a potentially active fault is a fault that has demonstrated surface displacement of Quaternary age deposits (last 1.6 million years) (Jennings and Bryant, 2010, Bryant and Hart, 2007). More recently the CGS has revised fault activity designations for the purpose of the Alquist-Priolo (A-P) Earthquake Fault Zoning Program (CGS, 2018b). A Holocene-active fault is one that has had surface displacement within Holocene time (about the last 11,700 years). A pre-Holocene fault is a fault that has been demonstrated to not have Holocene surface displacement. An age-undetermined fault is one where the recency of fault movement has not been determined.

Many fault systems are considered to be active (Field et al., 2013) but are not included in an A-P Zone. A list of nearby active faults (those faults included in Field et al., 2013) and the distance in miles between the Project and the nearest point on the fault, the maximum magnitude, and the slip rate for the fault is given in Table 1. The faults in the vicinity of the Project (Jennings and Bryant, 2010) are shown in Figure 6, Regional Faults and Seismicity Map.

Major faults that contribute the most to ground shaking hazard at the site are the Compton Thrust fault, a blind thrust fault underlying the Project, the Northridge Hills Blind Thrust which was the source of the 1994 Northridge earthquake, the Hollywood fault, an east-west trending strike-slip to reverse oblique fault on the southern flank of the Santa Monica mountains, the Santa Susana fault, a northwest-southeast trending reverse-oblique fault approximately 9 miles to the north-northwest of the grade separation, and the San Andreas, a strike-slip fault approximately 30 miles to the north-northeast

## 5.2 Fault Rupture

The Project is not within a currently established Alquist-Priolo Earthquake Fault Zone (A-P Zone) for surface fault rupture hazard (CGS, 2018a; CGS, 2002). An A-P Zone is an area which requires investigation to evaluate whether the potential for surface fault rupture is present near an active fault (CGS, 2018b). An active fault is defined as a fault with surface displacement within the last 11,700 years (Holocene). The closest established A-P Zone with the potential for fault surface rupture is for the Sierra Madre fault zone, located approximately 11.8 miles east-northeast of the planned Sepulveda Grade Separation (CGS, 2018a). The closest Quaternary active fault is the Northridge Hills fault located approximately 2.1 miles to the north of the planned Sepulveda Grade Separation (CGS, 2018a, Jennings and Bryant, 2010; USGS-CGS, 2006; CGS, 2002).

Faults with the potential for surface rupture are not known to be located directly beneath or projecting toward the planned Sepulveda Grade Separation alignment. The potential for surface rupture along the planned Sepulveda Grade Separation alignment due to fault plane displacement propagating to the ground surface during the design life of the project is considered low.

### Table 1. Major Holocene and Late Quaternary Faults in Southern California

| Fault (by increasing distance from Project site) | Maximum Magnitude (Mw) | Fault Geometry | Slip Rate (mm/yr.) | Sources | Distance From Site (miles) | Direction From Site |
|---|---|---|---|---|---|---|
| Compton Thrust | 6.8 | BT | 0.6 | (a) | 0* | - |
| Northridge Thrust | 7.0 | BT | 1.5 | (a) | 2.1 | N |
| Verdugo | 6.9 | RO | 0.4 | (a) | 5.8 | NE |
| San Fernando | 6.7 | RO | 2.0 | (a) | 7.1 | NNE |
| Hollywood | 6.4 | RO | 0.9 | (a) | 7.3 | SSE |
| Newport-Inglewood | 7.1 | SS | 1.0 | (a) | 7.4 | SSE |
| Santa Monica | 6.6 | RO | 1.0 | (a) | 8.3 | S |
| Santa Susana | 6.7 | RO | 6.0 | (a) | 8.7 | NNW |
| Simi-Santa Rosa | 7.0 | RO | 0.7 | (a) | 10.4 | NW |
| Anacapa-Dume | 7.5 | RO | 0.4 | (a) | 10.5 | SSW |
| Puente Hills Blind Thrust | 7.1 | BT | 0.9 | (a) | 10.5 | ESE |
| Upper Elysian Park Thrust | 6.4 | BT | 1.9 | (a) | 10.7 | ESE |
| Sierra Madre | 7.2 | RO | 2.0 | (a) | 11.8 | ENE |
| Raymond | 6.5 | RO | 2.0 | (a) | 12.2 | ESE |
| San Gabriel | 7.2 | SS | 0.4 | (a) | 12.6 | NNE |
| Malibu Coast | 6.7 | RO | 0.3 | (a) | 14.4 | SW |
| Holser | 6.5 | RO | 0.4 | (a) | 16.6 | N |
| Palos Verdes | 7.3 | SS | 3.0 | (a) | 17.3 | S |
| Oak Ridge | 7.1 | RO | 4.0 | (a) | 21.5 | NW |
| San Cayetano | 7.0 | RO | 6.0 | (a) | 21.9 | NW |
| Clamshell-Sawpit | 6.5 | RO | 0.4 | (a) | 25.0 | E |
| Palos Verdes | 7.3 | SS | 3.0 | (a) | 25.5 | S |
| Duarte | 7.2 | RO | 2.0 | (a) | 25.7 | E |
| Whittier | 6.8 | RO | 2.5 | (a) | 26.7 | SE |
| San Andreas | 7.4 | SS | 34.0 | (a) | 30.4 | NNE |
| San Jose | 6.4 | RO | 0.4 | (a) | 34.7 | ESE |
| Santa Ynez | 7.1 | SS | 2.0 | (a) | 35.9 | NW |

| | |
|---|---|
| (a) | Cao et al., 2003; Field et al., 2013 |
| SS | Strike Slip |
| RO | Reverse Oblique |
| BT | Blind Thrust |

(*)Horizontal distance from thrust fault surface projection (upper limb)

## 5.3 Historic Earthquakes and Seismicity

The seismicity of the region surrounding the site was determined from research of an electronic database of seismic data (Southern California Seismographic Network, 2018). This database includes earthquake data compiled by the California Institute of Technology for 1932 through 2018 and data for 1769 to 1931 compiled by the CGS. The search for earthquakes that occurred within 100 kilometers of the site indicates that 457 earthquakes of Richter magnitude 4.0 and greater occurred from 1932 through 2018 and 36 earthquakes of magnitude 4.0 or greater occurred between 1769 and 1931 as tabulated on Table 2. Epicenters of some of the moderate and major earthquakes (magnitude 5.0 and greater) are shown in Figure 6.

Several earthquakes of moderate to major magnitude have occurred in the Southern California area within about the last 87 years. A partial list of these earthquakes is included in the following table.

**Table 2. List of Historic Earthquakes**

| Earthquake (Oldest to Youngest) | Date of Earthquake | Magnitude | Distance to Epicenter (miles) | Direction to Epicenter |
|---|---|---|---|---|
| Long Beach | March 11, 1933 | 6.4 | 48 | SE |
| San Clemente Island | December 26, 1951 | 5.9 | 94 | S |
| Tehachapi | July 21, 1952 | 7.5 | 65 | NW |
| San Fernando | February 9, 1971 | 6.6 | 16 | NNE |
| Whittier Narrows | October 1, 1987 | 5.9 | 24 | SE |
| Sierra Madre | June 28, 1991 | 5.8 | 28 | ENE |
| Landers | June 28, 1992 | 7.3 | 116 | E |
| Big Bear | June 28, 1992 | 6.4 | 94 | E |
| Northridge | January 17, 1994 | 6.7 | 5 | NW |
| Hector Mine | October 16, 1999 | 7.1 | 128 | ENE |
| Sierra El Mayor | April 4, 2010 | 7.2 | 242 | SE |
| La Habra | March 28, 2014 | 5.1 | 36 | SE |
| Borrego Springs | June 10, 2016 | 5.2 | 127 | SE |
| Channel Islands | April 5, 2018 | 5.3 | 76 | SW |

## 5.4 Seismic Ground Shaking

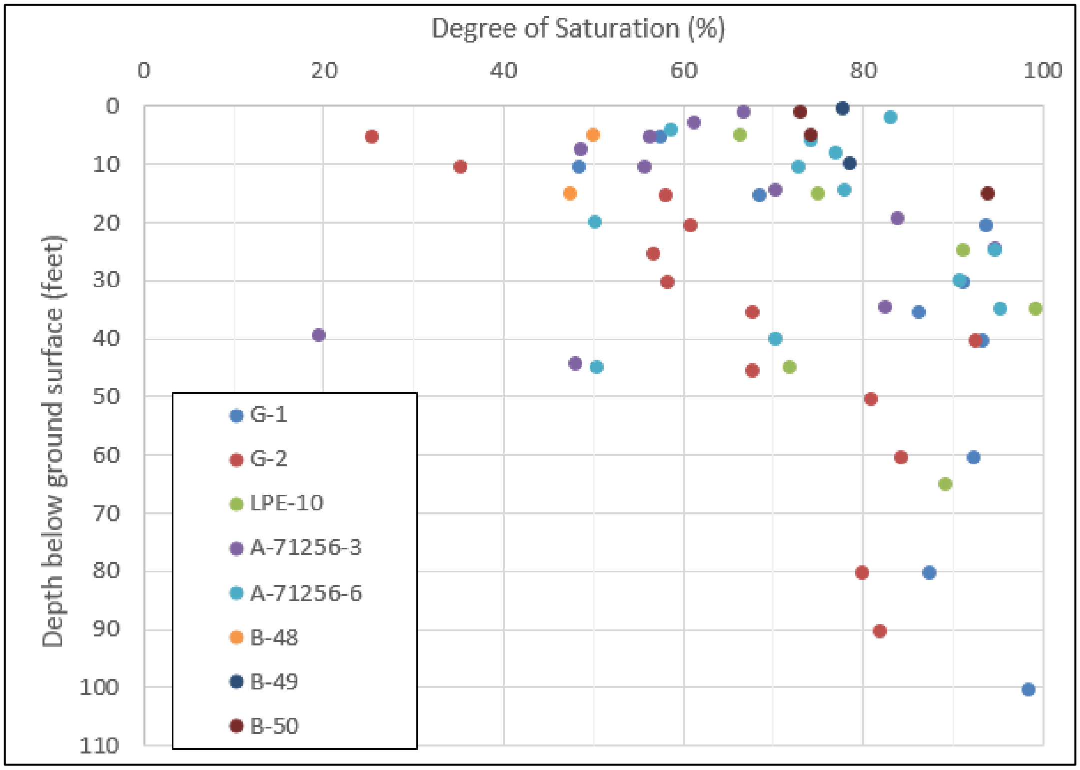
The proximity of the Project alignment relative to known active faults indicates the planned Sepulveda Grade Separation could be subjected to significant ground shaking in the event of an earthquake. This hazard is common in Southern California and the effects of ground shaking can be mitigated by proper engineering design and construction in conformance with current building codes and engineering practices.

## 5.5 Liquefaction and Seismic Induced Settlement

Liquefaction potential is greatest where the depth to ground water is shallow, and submerged, loose, fine sands occur within a depth of about 50 feet or less. Liquefaction potential decreases as grain size and clay and gravel content increase. As ground acceleration and shaking duration increase during an earthquake, liquefaction potential increases. According to the City of Los Angeles Safety Element (1996, accessed 2018) and the County of Los Angeles General Plan (2015), and the California Geological Survey [(California Division of Mines and Geology (CDMG), 1998], the Project alignment is within an area identified as potentially liquefiable as shown on Figure 7, Liquefaction Hazard Map. Therefore, a site-specific liquefaction evaluation was performed for the project.

The Metro Rail Design Criteria, Metro Supplemental Seismic Design Criteria (MRDC, 2017), Section 5 Appendix, Section 3A13.0, states that liquefaction susceptibility shall be determined using the procedures documented in Article 10.4 and 10.5.4 of the AASHTO-CA LRFD BDS. The referenced procedures indicate that the liquefaction potential should be evaluated based on the “anticipated” groundwater elevation. As a general practice in California, the historic-high groundwater level is used for this purpose. However, in some areas of California where the groundwater level has remained at a significantly deeper level for a long time duration (decades), and there is reason to believe that the management of the groundwater basin of the site would not allow groundwater to rise to the historic-high level in the anticipated design life of the Project, then in those cases a level deeper than the historic high level is sometimes used in the liquefaction evaluation (see additional discussion regarding groundwater regulation in Section 4.3).

In addition, it should be noted that soil layers that are saturated or are anticipated to be saturated in the future, whether below the groundwater level, or within a perched water zone underlain by less permeable materials, should be evaluated for liquefaction potential. Based on the laboratory results of samples obtained from borings along and near the alignment of the Project, the degree of saturation was estimated assuming a specific gravity of 2.7 for each undisturbed sample as presented below. As seen in the plot below, at depths shallower than 50 feet, the soils (at the time of sampling) were not consistently near saturated levels, indicating that the true static groundwater level is below this depth.



According to the California Geological Survey (CGS) 1997 Seismic Hazard report for the Van Nuys 7.5-Minute Quadrangle (revised 2001), the historically highest groundwater level in the area is between 10 and 20 feet bgs (15 feet bgs is taken as the average historic high depth along the Project alignment). The CGS report states that the historically highest groundwater level is based on the 1944 groundwater elevation contours when groundwater levels reportedly reached their highest level before excessive pumping caused drawdowns throughout the basin.

CGS also states that the "measured groundwater levels in the 1970's, 1980's and 1990's tend to be 10 to 20 feet deeper than the 1944 water level." Therefore, a reasonable level for the anticipated (i.e. design) groundwater depth is taken as 35 feet bgs (corresponding to 20 feet deeper than CGS historically highest groundwater depth of 15 feet bgs) for the purpose of liquefaction evaluation. Based on the nearby Well 3732A, which measured the groundwater table at much greater depths during the same time period, a groundwater depth of 35 feet bgs represents a perched groundwater condition. Considering that the measured groundwater depth is currently about 70 feet bgs from recent borings/wells and the fact that the highest groundwater level measured in nearby Well 3732A is at 96.3 feet bgs, it is our opinion that an anticipated design groundwater depth of 35 feet bgs for the project is conservative, but reasonable for the purpose of liquefaction evaluation, especially considering the upper 30 to 40 feet of soils (or the upper 35 feet of soils on average) are clayey and not susceptible to liquefaction (see Section 4.3 for further discussion of groundwater levels measured in well, rainfall data and groundwater storage capacity of the San Fernando Basin).

A list of the explorations used in the liquefaction evaluation is presented below.

| **Exploration Identification** | **Exploration Depth (feet, bgs)** |
|---|---|
| G-1 | 100.5 |
| G-2 | 100.5 |
| LPE-10 | 85.5 |
| CPT-1/1A | 86/95.3 |
| CPT-2 | 100.1 |
| CPT-3 | 100.1 |
| CPT-4 | 95.3 |
| CPT-4A | 95.3 |

Note: Borings B-48, B-49, B-50, A-71256 (3) and A-71256 (6) were excluded from analyses as they were either too shallow (less than 50 feet) or did not have blowcount data.

The liquefaction potential was evaluated using the Youd and Idriss, 1997 (NCEER Technical Report 97-0022) consensus publication on liquefaction evaluation, and Youd et al., 2001 summary report from 1996 NCEER and 1998 NCEER/NSF workshop on evaluation of liquefaction resistance of soils and methodology described in Idriss-Boulanger (2008) and Bray-Sancio (2006) for liquefaction susceptibility evaluation of fine-grained soils. The liquefaction analyses was performed for the three design earthquakes and for two groundwater level scenarios. The design earthquake events were ODE, MDE and Caltrans 975-year design event (see Sections 7.1 and 7.2); the governing earthquake magnitude and PGA associated with these hazard levels are discussed in Table 7. We considered two groundwater level scenarios in our analysis (1) CGS historically highest groundwater depth of 15 feet bgs and (2) anticipated design groundwater depth of 35 feet bgs. However, it is noted the results are similar for the two assumed depths as the soils within the upper 30 to 40 feet of the ground surface are predominately clayey based on visual inspection and laboratory testing.

Based on the SPT-based liquefaction evaluation and design PGA's and magnitudes in Table 7, two current borings (G-1 and G-2) did not indicate liquefaction potential; prior boring LPE-10 indicated liquefaction-induced ground settlement of about 1½ inches for MDE and for Caltrans 975-year design event and none for ODE event. The CPT-based liquefaction evaluation results in a maximum settlement of 2 to 3.5 inches for MDE, less than ¼ inch for ODE and less than 1.5

inches for the Caltrans 975-year design event. Although the soil classification in the CPTs for the potential liquefaction layers somewhat matches those in the adjacent borings, the corrected SPT blow count for those layers is 50 blows per foot (bpf) or greater resulting in no computed liquefaction settlement. If based on uncorrected (field) blow count, the only potential zone appears to be a layer of silty sand between depths of 35 and 40 feet bgs where the uncorrected SPT blow count was 30 bpf and this layer contributes about 1 inch of settlement. It is recommended that additional borings with SPT sampling and CPTs be performed in future phases of the Project investigation to further evaluate liquefaction potential and liquefaction-induced settlement. For the purpose of preliminary design, liquefaction-induced settlement is taken as 1 inch total and ½ inch differential over a horizontal distance of 50 feet and the depth of impact on pile foundations is 35 feet, assuming the groundwater level will rise to CGS historically highest groundwater level of about 15 feet bgs.

Seismically-induced dry settlement is often caused by loose to medium-dense granular soils densified during ground shaking. Uniform settlement beneath a given structure would cause minimal damage; however, because of variations in distribution, density, and confining conditions of the soils, seismically-induced settlement is generally non-uniform and can cause serious structural damage. Dry and partially saturated soils as well as saturated granular soils are subject to seismically-induced settlement. The soils above the groundwater level (CGS historic-high of 15 feet bgs or design water level of 35 feet bgs) are primarily fine-grained and clayey and, therefore, the seismically-induced settlement is considered negligible for all three design events.

### 5.6 Slope Stability

Topographically, the Project alignment is relatively level, sloping from approximately Elevation 715 feet at the west to Elevation 700 feet at the east over the ½ mile of Project alignment. There are no known landslides near the Project alignment, nor is the alignment in the path of any known or potential landslides according to the CGS (CGS, 2018c). The Project alignment is not within an area identified as having a potential for earthquake-induced landslides (CDMG, 1998).

### 5.7 Tsunamis, Inundation, Seiches, Flooding and Subsidence

The Project alignment is not in a coastal area and at an approximate mean elevation of 700 feet. Therefore, tsunamis (seismic sea waves) are not considered a hazard along the Project alignment.

According to the City of Los Angeles Safety Element (1996) and the County of Los Angeles General Plan (2015), the Project alignment is located within a potential inundation area for an earthquake-induced dam failure from the Lopez, Pacoima, and Hansen Dams. However, these dams, as well as others in California, are continually monitored by various governmental agencies (such as the State of California Division of Safety of Dams and the U.S. Army Corps of Engineers) to guard against the threat of dam failure. Catastrophic failure of a major dam as a result of a scenario earthquake is regarded as unlikely. Current design and construction practices, and ongoing programs of review, modification, or total reconstruction of existing dams are intended to ensure that all dams are capable of withstanding the maximum magnitude earthquake. Therefore, the potential for inundation along the alignment as a result of an earthquake-induced dam failure is considered low.

The Project alignment is in an area of minimal flooding potential (Zone X). Zone X, as defined by the Federal Emergency Management Agency (FEMA, 2008), is an area outside of the 0.2% annual chance flood. Therefore, the potential for flooding along the alignment is considered low.

The Project alignment is not located within an area of known ground subsidence associated with groundwater withdrawal, peat oxidation or hydro-compaction. Therefore, the potential for subsidence to affect the Project is low.

## 5.8 Oil Wells and Methane Gas and Subsidence

According to the California Division of Oil, Gas, and Geothermal Resources (DOGGR) Well Finder System, the Project alignment is not situated in an oil field and there are no known oil wells in the area (DOGGR, 2018).

The Project alignment is in a methane zone according to the City of Los Angeles (ZIMAS, 2018). Therefore, the risk of encountering methane must be considered. Metro has decided to advance the geotechnical design from 30% to 100% design through design-build procurement process, therefore, the potential for methane gas should be considered and further evaluated in the final design.

## 5.9 Scour

This Project alignment does not cross a channel, basin or streambed that conveys water, and most of the water sources in the vicinity of the project are confined in engineered facilities. Therefore, scour is not considered a design issue for the Project.

## 5.10 Geologic Conclusions

Based on the available geologic data, active or potentially active faults with the potential for surface fault rupture are not known to be located beneath or projecting toward the Project alignment. The potential for surface rupture at the site due to fault plane displacement propagating to the ground surface during the design life of the Project is considered low. Although the Project could be subjected to strong ground shaking in the event of an earthquake, this hazard is common in Southern California and the effects of ground shaking can be mitigated by proper engineering design and construction in conformance with current building codes and engineering practices.

Based on the analyses, the total and differential liquefaction-induced settlement be taken as 1 inch and ½ inch over a horizontal distance of 50 feet, respectively. It is recommended that additional borings with SPT sampling and CPTs be performed in the future phases of the project to arrive at a final value for design. The seismically-induced (dry) settlement is considered negligible for all three design events.

The Project alignment is relatively level and the absence of nearby slopes precludes slope stability hazards. The potential for other geologic hazards such as tsunamis, inundation, seiches, flooding, and subsidence affecting the alignment is considered low. The project alignment is in a methane zone according to the City of Los Angeles (ZIMAS, 2018). Therefore, the risk of encountering methane must be considered, especially as related to enclosed rooms or vaults that may be associated with the Project.

# 6 Corrosion Evaluation

Laboratory soil corrosivity testing was performed by ETC on a sample obtained at a depth of 15 feet below the surface grade from one of the ETC borings (LPE-10) drilled in the project vicinity. The sample was collected in clayey soils and the test results indicated the soils are moderately corrosive to ferrous metals and that the potential for sulfate attack on portland cement concrete is consider negligible.

The 2017 DYA report also states that corrosion tests were performed on six soil samples collected from the upper 40 feet of the on-site soil along the MOL alignment. The test data by indicated that the clayey soils encountered in the upper 20 feet below the surface grade were generally corrosive to buried metal and the soils below that depth are non-corrosive to buried metal based on Caltrans (2018a) and County of Los Angeles (2013) criteria. The test results also indicate that the sulfate content of these soils were generally below the threshold for soils that are considered corrosive to concrete.

In addition, soil corrosivity testing was performed on five soil samples collected from depths of 5.5 to 70 feet from recently drilled borings G-1 and G-2. Following Caltrans Corrosion Guidelines (version 2.0, 2019), the test data indicates that the soils are moderately corrosive to corrosive to ferrous metals and that the potential for sulfate attack on portland cement concrete is considered negligible.

In summary, all currently available corrosivity test data indicates that the soils are moderately corrosive to corrosive to ferrous metals and not corrosive to concrete. Additional corrosion testing should be performed in future investigation phases to make a final determination of soil corrosivity. Necessary corrosion protection for concrete and metal structures in contact with soil as required by Metro and Caltrans Standards should be provided.

Metro has decided to advance the geotechnical design from 30% to 100% design through design-build procurement process, therefore, the potential for soil corrosivity should be further evaluated in the final design.

# 7 Ground Motion Evaluation

The Project is located in seismically active southern California and is subject to shaking from both local and distant earthquakes. The following sections provide the design acceleration spectra computed in accordance with procedures in Caltrans Seismic Design Criteria (version 2.0 dated April 2019) which is applicable for the bridge structures and procedures in Metro Rail Design Criteria (Revision 12 dated November 20, 2017) are applicable to the aerial guideway structures including MSE walls and bridge structure, however in no case shall the seismic design results in performance less than that required by AASHTO-CA LRFD BDS (2012). Furthermore, the peak ground accelerations (PGAs) considered in the evaluation for liquefaction potential and seismically induced settlement for the hazard levels considered are also presented in this section.

The acceleration response spectra (ARS) were calculated at the grade separation proposed at Sepulveda Boulevard. The key parameters used in determining the ground motion response spectra are listed in Table 3.

**Table 3. Key Parameters for Determining Preliminary ARS Curve**

| Structure | Site Coordinates | | Shear Wave Velocity $V_{s30}$ |
|---|---|---|---|
| | Latitude | Longitude | |
| Sepulveda Blvd. Bridge | 34°10'49.82"N | 118°27'58.37"W | 350 m/sec |

The seismic shear wave velocity measurements were collected in CPT-2 and CPT-4A performed during this investigation. The shear wave velocity profiles with depth between the two locations was similar and therefore the average of the two profiles was taken as the idealized shear-wave velocity for the Project. The average shear wave velocity within 100 feet of the ground surface (30 meters) was estimated as 350 meters per second and was used in the ground motion evaluation for this segment. The depth to a shear wave velocity of 1,000 meters per second beneath the site ($Z_{1.0}$) and depth to a shear wave velocity of 2,500 meters per second ($Z_{2.5}$) were taken as 300 meters and 2.25 kilometers, respectively, from the latest Southern California Earthquake Center (SCEC) Community Velocity Model.

## 7.1 Caltrans Design Acceleration Response Spectra

The design acceleration response spectra were computed using the Caltrans ARS web-based tool following procedures in Appendix B of the Caltrans seismic design criteria (2019). The ARS web tool calculates both deterministic and probabilistic spectra. The deterministic spectra is computed as the average of the median response using two of the Next Generation Attenuation ground motion prediction equations (GMPEs), namely Campbell-Bozorgnia (2008) and Chiou-Youngs (2008) relationships and for faults considered to be active and those that are capable of producing a moment magnitude earthquake (Mw) of 6.0 or greater. In order to account for potential earthquakes on unknown faults, a statewide minimum deterministic spectrum for a scenario of 6.5 magnitude vertical strike slip event occurring at a distance of 12 kilometers (7.5 miles) is also considered.

The nearest substantial local sources of earthquakes are provided in Table 4 along with their deterministic response spectrum according to the Caltrans Fault Database (Merriam, 2012). The site-to-fault distances and deterministic Peak Ground Accelerations (PGA) were determined using Caltrans ARS Online V2.3.09 (2017).

**Table 4. Caltrans ARS Response Spectra**

| Period | Minimum Deterministic Spectrum | Anacapa-Dume alt 1 Final Spectrum | Northridge Hills Final Spectrum | Verdugo-Eagle Rock Final Spectrum | Probabilistic Final Spectrum | Envelope |
|---|---|---|---|---|---|---|
| (sec) | SA (g) | SA (g) | SA (g) | SA (g) | SA (g) | SA (g) |
| 0.010 | 0.225 | 0.430 | 0.368 | 0.300 | 0.663 | 0.663 |
| 0.050 | 0.283 | 0.543 | 0.457 | 0.373 | 1.021 | 1.021 |
| 0.100 | 0.420 | 0.768 | 0.629 | 0.536 | 1.229 | 1.229 |
| 0.150 | 0.503 | 0.914 | 0.738 | 0.638 | 1.395 | 1.395 |
| 0.200 | 0.522 | 0.962 | 0.785 | 0.671 | 1.525 | 1.525 |
| 0.250 | 0.505 | 0.949 | 0.781 | 0.659 | 1.507 | 1.507 |
| 0.300 | 0.483 | 0.921 | 0.760 | 0.638 | 1.492 | 1.492 |
| 0.400 | 0.432 | 0.841 | 0.704 | 0.583 | 1.353 | 1.353 |
| 0.500 | 0.378 | 0.762 | 0.631 | 0.522 | 1.254 | 1.254 |
| 0.600 | 0.324 | 0.703 | 0.571 | 0.476 | 1.108 | 1.108 |
| 0.700 | 0.283 | 0.657 | 0.525 | 0.440 | 1.046 | 1.046 |
| 0.850 | 0.237 | 0.597 | 0.465 | 0.396 | 0.944 | 0.944 |
| 1.000 | 0.202 | 0.547 | 0.416 | 0.359 | 0.857 | 0.857 |
| 1.200 | 0.165 | 0.454 | 0.338 | 0.296 | 0.699 | 0.699 |
| 1.500 | 0.127 | 0.351 | 0.254 | 0.228 | 0.544 | 0.544 |
| 2.000 | 0.088 | 0.229 | 0.168 | 0.156 | 0.395 | 0.395 |
| 3.000 | 0.051 | 0.118 | 0.094 | 0.092 | 0.237 | 0.237 |
| 4.000 | 0.035 | 0.075 | 0.062 | 0.064 | 0.165 | 0.165 |
| 5.000 | 0.026 | 0.058 | 0.046 | 0.048 | 0.135 | 0.135 |

The probabilistic spectrum is obtained from the 2008 USGS National Hazard Map for 5% probability of exceedance in 50 years (or for an event with a return period of 975 years). Since the USGS probabilistic spectrum is computed for site class B ($V_{s30}$ = 760 meters per second), the spectrum is adjusted for site class by multiplying the spectral ordinates with site amplification factors used by the USGS map. The amplification factor was computed as 1.0 for the site. Furthermore, due to the proximity of the project to active faults, both the deterministic and probabilistic spectra are adjusted for near-source directivity; the adjustment factor per Caltrans SDC for deterministic spectrum is taken as 1.2 for spectral periods longer than one second and linearly tapering to zero at a period of 0.5 second. For applying near-source directivity factors to probabilistic spectra, a hazard disaggregation was performed to evaluate the hazard contribution of faults within 25 kilometers to the overall hazard and that factor was computed as 0.94 (see Section 7.2) and applied to the near-source directivity factors specified by Caltrans for the deterministic spectra.

The final Caltrans design spectrum is taken as the larger of the deterministic and probabilistic spectra as presented in Table 4. The probabilistic response spectrum controls the Caltrans ARS curve as shown in the table. The preliminary ARS curve is presented in attached Figure 8.

## 7.2 Design Acceleration Response Spectra for MDE and ODE

As stated in Section 2.3.2 of the Metro Rail Design Criteria (MRDC) dated November 20, 2017 (Revision 12), seismic design of aerial and surface structures should be based on two hazard levels as described below.

(1) Operating Design Earthquake (ODE) defined as an earthquake event likely to occur only once in the design life, where structures are designed to respond without significant structural damage. The current Metro Code defines ODE as an event with a 50% probability of exceedence in 100 years (corresponding to a return period of 150 years).

(2) Maximum Design Earthquake (MDE) – defined as an earthquake event with a low probability of occurring in the design life, where structures are designed to respond with repairable damage and to maintain life safety. The current Metro Code defines MDE as an event with a 4% probability of exceedence in 100 years (corresponding to a return period of 2,475 years).

The performance objectives for the ODE and MDE events are described in Section 3A3.0 of the MRDC – For ODE, the structures shall be designed to respond in elastic manner and there shall be no collapse but minor damage that is easily repairable such that the structure is fully operational immediately after the earthquake. For MDE, the structures are expected to behave in an inelastic manner, but no collapse is allowed and any structural damage may be limited to elements that visible and can be readily repairable. Furthermore, it is stated that the design shall in case result in a seismic performance that is less than that required by AASHTO-CA LRFD BDS (see Section 7.1).

Probabilistic seismic hazard analyses were conducted using the USGS Unified Hazard Tool (2018) and the Dynamic: Conterminous U.S. 2014 (v4.1.1) model. Since the USGS web-based tool provide spectral ordinates at specific periods (0.01, 0.2, 1 and 2 seconds), a calculation using the computer program openSHA (Field et. al., 2013) using parameters mirroring those used in the USGS tool evaluation was performed to provide more points on the spectrum.

The probabilistic spectra thus obtained was corrected for basin amplification and near-source directivity effects. For applying near-source directivity factors to probabilistic spectra, a hazard disaggregation was performed to evaluate the hazard contribution of faults within 25 kilometers to the overall hazard and that factor was computed as 0.94 and applied to the near-source directivity factors stated in the earlier section to arrive at the adjusted factors presented in Table 5. The preliminary peak ground acceleration (PGA) (taken as the spectral acceleration at a period of 0.01 second), and spectral response accelerations at periods through 5.0 seconds period for the MDE and ODE hazard levels are presented in Table 5 and 6 and Figures 9 and 10, respectively.

## Table 5. Acceleration Response Spectrum for MDE

| Period | Sepulveda Blvd. Bridge MDE UHS | Basin Factor | Near Fault Factor Adjusted for Disaggregation | Adjusted Sepulveda Blvd. Bridge MDE UHS |
|---|---|---|---|---|
| (sec) | SA (g) | - | - | SA (g) |
| 0.01 | 0.957 | 1.00 | 1.00 | 0.957 |
| 0.05 | 1.199 | 1.00 | 1.00 | 1.199 |
| 0.10 | 1.791 | 1.00 | 1.00 | 1.791 |
| 0.15 | 2.077 | 1.00 | 1.00 | 2.077 |
| 0.20 | 2.221 | 1.00 | 1.00 | 2.221 |
| 0.25 | 2.289 | 1.00 | 1.00 | 2.289 |
| 0.30 | 2.304 | 1.00 | 1.00 | 2.304 |
| 0.40 | 2.169 | 1.00 | 1.00 | 2.169 |
| 0.50 | 1.995 | 1.00 | 1.00 | 1.995 |
| 0.60 | 1.807 | 1.00 | 1.00 | 1.807 |
| 0.70 | 1.619 | 1.00 | 1.02 | 1.643 |
| 0.85 | 1.389 | 1.00 | 1.07 | 1.488 |
| 1.00 | 1.184 | 1.00 | 1.17 | 1.386 |
| 1.20 | 1.014 | 1.00 | 1.13 | 1.143 |
| 1.50 | 0.757 | 1.00 | 1.13 | 0.854 |
| 2.00 | 0.533 | 1.00 | 1.13 | 0.601 |
| 3.00 | 0.323 | 1.00 | 1.13 | 0.365 |
| 4.00 | 0.221 | 1.00 | 1.13 | 0.249 |
| 5.00 | 0.165 | 1.00 | 1.13 | 0.186 |

**Table 6. Acceleration Response Spectrum for ODE**

| Period | Sepulveda Blvd. Bridge ODE UHS | Basin Factor | Near Fault Factor Adjusted for Disaggregation | Adjusted Sepulveda Blvd. Bridge ODE UHS |
|---|---|---|---|---|
| (sec) | SA (g) | - | - | SA (g) |
| 0.01 | 0.359 | 1.00 | 1.00 | 0.359 |
| 0.05 | 0.448 | 1.00 | 1.00 | 0.448 |
| 0.10 | 0.679 | 1.00 | 1.00 | 0.679 |
| 0.15 | 0.812 | 1.00 | 1.00 | 0.812 |
| 0.20 | 0.854 | 1.00 | 1.00 | 0.854 |
| 0.25 | 0.852 | 1.00 | 1.00 | 0.852 |
| 0.30 | 0.826 | 1.00 | 1.00 | 0.826 |
| 0.40 | 0.726 | 1.00 | 1.00 | 0.726 |
| 0.50 | 0.639 | 1.00 | 1.00 | 0.639 |
| 0.60 | 0.562 | 1.00 | 1.00 | 0.562 |
| 0.70 | 0.485 | 1.00 | 1.02 | 0.493 |
| 0.85 | 0.399 | 1.00 | 1.07 | 0.428 |
| 1.00 | 0.328 | 1.00 | 1.17 | 0.384 |
| 1.20 | 0.277 | 1.00 | 1.13 | 0.312 |
| 1.50 | 0.200 | 1.00 | 1.13 | 0.225 |
| 2.00 | 0.136 | 1.00 | 1.13 | 0.153 |
| 3.00 | 0.080 | 1.00 | 1.13 | 0.090 |
| 4.00 | 0.053 | 1.00 | 1.13 | 0.060 |
| 5.00 | 0.039 | 1.00 | 1.13 | 0.044 |

## 7.3 Earthquake Magnitude and PGA for Liquefaction and Seismic Induced Settlement Evaluation

The PGA for ODE and MDE were computed using the USGS “Conterminous U.S. 2014 (v4.1.1)” Unified Hazard Tool (website: https://earthquake.usgs.gov/hazards/interactive/). The PGA was estimated using the average of the ground motions obtained from the Next Generation Attenuation relationships programmed in the Unified Hazard Tool. The controlling earthquake magnitude for PGA for the three events was obtained from hazard deaggregation tool from the same USGS website stated above. The results earthquake magnitude and PGA computed in the manner stated above are presented in Table 7.

**Table 7. PGA and Magnitude for Liquefaction Evaluation**

| Design Earthquake | Magnitude (Mw) | PGA |
|---|---|---|
| ODE (150 year event) | 6.55 | 0.359g |
| MDE (2475 year event) | 6.85 | 0.957g |
| Caltrans (975 year event) | 6.75 | 0.663g |

# 8 Foundation Recommendations

## 8.1 Deep Foundations

Based on current design plans, the Sepulveda Boulevard busway/station bridge will be a four-span cast-in-place prestressed concrete box girder bridge structure with two abutments and three bents. The superstructure is approximately 420 feet long and the deck is approximately 70 feet wide. The deck structure accommodates a westbound and an eastbound travel lane, about 42 feet wide total, and side-running platforms about 12-feet wide each. The bridge abutments consist of concrete cantilever walls retaining the west and east approach embankments. Each bridge bent consists of two concrete guideway columns on individual foundations. The existing Sepulveda Boulevard road grades are relatively level at about El. 707 feet and the new top of bridge deck is proposed at about El. 736 feet. Ancillary structures attached to the superstructure include elevators, escalators, and canopies.

### 8.1.1 Foundation Type

Due to the presence of compressible soils and large structural demands, deep foundations are recommended to support of the new bridge. Based on the geotechnical data collected to date, driven piles or drilled Cast-In-Drilled Hole (CIDH) pile types are feasible as discussed in the Preliminary Foundation Report (Wood/EMI, 2018). Drilled piles are the preferred pile type due to large load demands, limited space for a multiple driven pile group, presence of many buried utilities in the Sepulveda Boulevard area, and noise and ground vibration associated with pile driving. Driven piles are geotechnically also feasible if these issues are properly addressed and/or do not control. Larger diameter drilled shafts will likely be used at the bents of either bridge in consideration of space constraints above and below ground surface and to minimize excavation. Smaller-size drilled piles are likely to be used at the abutments to optimize construction and economize on cost. Drilled piles may involve temporary or permanent steel casing.

Design of CIDH piles should follow AASHTO-CA BDS LRFD (2012 LRFD Bridge Design Specifications with California Amendments, 2014), Caltrans Seismic Design Criteria, Version 2.0 (April 2019), and Caltrans Memo To Designers 3-1 (2014) and Metro Baseline Specifications.

### 8.1.2 Foundation Data

The design of bridge foundations is based on Load and Resistant Factor Design (LRFD) following in AASHTO-CA BDS LRFD. LRFD Service-I Limit State, Strength Limit State, and Construction Limit State load combinations are used for design of abutment foundations. The LRFD Service-I Limit State, Strength Limit State, and Extreme Event Limit State load combinations are used for the design of the bent foundations.

Foundation design data and demands were provided by Mott MacDonald. The design data and loads is shown in Table 8 and Table 9 following Caltrans Memo To Designer 3-1 (2014) format.

**Table 8. Bridge Foundation Design Data**

| Support | Design Method | Pile Type | Finished Grade El. (ft) | Cut-Off El. (ft) | Pile Cap Size (ft) | | Permissible Settlement under Service Load (inch) | No. of Piles per Support |
|---|---|---|---|---|---|---|---|---|
| | | | | | B | L | | |
| **Sepulveda Blvd GS – Busway Bridge** | | | | | | | | |
| Abut 1 | LRFD | 60” Dia. CIDH | 707.0 | 700.0 | 7 | 53 | 1 | 4 |
| Bent 2 | LRFD | 120" Dia. CIDH | 707.0 | 700.0 | N/A | N/A | 1 | 2 |
| Bent 3 | LRFD | 120" Dia. CIDH | 707.0 | 700.0 | N/A | N/A | 1 | 2 |
| Bent 4 | LRFD | 120" Dia. CIDH | 707.0 | 700.0 | N/A | N/A | 1 | 2 |
| Abut 5 | LRFD | 60" Dia. CIDH | 707.0 | 700.0 | 7 | 53 | 1 | 4 |

Note: N/A = Not Applicable

**Table 9. Bridge Foundation Design Loads**

| Support | Service-I Limit State (kips) | | | Strength/Construction Limit State (kips) | | | | Extreme Event Limit State (kips) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Total Load | | Permanent Loads | Compression | | Tension | | Compression | | Tension | |
| | Per Support | Max. Per Pile | Per Support | Per Support | Max. Per Pile | Per Support | Max. Per Pile | Per Support | Max. Per Pile | Per Support | Max. Per Pile |
| **Sepulveda Blvd GS – Busway Bridge** | | | | | | | | | | | |
| Abut 1 | N/A | 500 | N/A | N/A | 600 | N/A | N/A | N/A | 500 | N/A | 0 |
| Bent 2 | N/A | 2,550 | N/A | N/A | 3,300 | N/A | N/A | N/A | 3,450 | N/A | 0 |
| Bent 3 | N/A | 3,000 | N/A | N/A | 3,900 | N/A | N/A | N/A | 4,050 | N/A | 0 |
| Bent 4 | N/A | 3,350 | N/A | N/A | 4,350 | N/A | N/A | N/A | 4,500 | N/A | 0 |
| Abut 5 | N/A | 650 | N/A | N/A | 850 | N/A | N/A | N/A | 650 | N/A | 0 |

Note: N/A = Not Applicable (load per pile provided in the table)

### 8.1.3 Soil Parameters for Pile Design

Based on the boring and laboratory test results, an idealized soil profile was developed for axial and lateral pile capacity evaluation as presented in Table 10.

**Table 10. Idealized Soil Parameters for Pile Design**

| **Depth below OG (ft)** | **Predominant Soil Type (USCS)** | **SPT-Equivalent Blowcounts per foot (design value)** | **Total Unit Weight (pcf)** | **Friction Angle (design value)** | **Cohesion/ Shear Strength (psf)** | **Subgrade Modulus k (pci)** |
|---|---|---|---|---|---|---|
| **Sepulveda Station (based on LPE-10, CPT-2, and B-48)** | | | | | | |
| OG-36 | Stiff Clay (CL) | 12-30<br>(16) | 120 | 0º | 1,900 | NA |
| 36-68 | Medium Dense Sands (SC, SM, SP) with Layer of Stiff Clay (CL) | 40-90<br>(40) | 130 | 38º | 0 | 180 |
| 68-74 | Very Dense Clayey Sand (SC) | 40-100<br>(50) | 68* | 38º | 0 | 120 |
| 74-96 | Dense to Very Dense Sands (SM, SP) | 40-90<br>(50) | 73* | 38-42º<br>(38º) | 0 | 100 |

Notes:

OG is near Elevation 707 feet for Sepulveda Blvd Crossing

USCS=Unified Soil Classification System

For clay layers, use the "Stiff Clay without water table" model in LPILE and a $\varepsilon_{50}$ parameter of 0.005 or as provided in LPILE (Ensoft, 2019). For sand layers, use "Sand (Reese)" model in LPILE.

*buoyant unit weight for soils below groundwater level

### 8.1.4 Axial Capacity

The bridge abutment foundations at are expected to be earth retaining walls on concrete pile caps embedded below finished grade. The pile caps are supported by groups of piles which should be spaced at least 2.5D apart on-center where D is the diameter of the pile (AASHTO-CA BDS Section 10.8.4.6). Each bent column is proposed to be supported by a large-diameter Type I or II drilled shaft.

Abutment piles are proposed to be constructed prior to construction of the adjacent raised MSE walls. Subsequent placement of the embankment fills will induce ground settlements below the bottom of fills (see Section 8.4). Per the designer, surcharging is not feasible at project site to remove some or all of the ground settlement prior to pile construction. The ground settlements due to fill placement occurring around the piles will cause additional pile downdrag forces acting on the pile foundations after construction. Pile downdrag effects in the upper 36 feet from this impact and soil liquefaction-induced ground settlements (see Section 5.5) were incorporated at the abutments. A settlement criterion of approximately ½ inch was used in determining the depth of downdrag for preliminary design of pile foundations.

Axial pile capacity analyses were conducted using Section 10.8 of AASHTO-CA BDS LRFD and Reese and O'Neill (FHWA, 2010) methods. Pile downdrag effects were incorporated for pile design at the abutments.

The bent piles are expected to tip in bearing strata consisting of very dense sands with interbeds of hard clays. Due to the large demands at the bents and to reduce pile length and cost of large-diameter piles, base resistance was included for the bent pile foundations. Ultimate base resistance was defined at a pile tip settlement equal to 5% of the pile diameter (Section 10.8.3.5 AASHTO-CA BDS LRFD) and adjusted for pile diameter and limiting pile-head displacement of 1 inch as required in Table 8. Recommendations for construction are provided in Section 8.1.7. A resistance factor of 0.7 was used for the Strength Limit state, and 1.0 for the Extreme Event state, for both skin friction and end-bearing.

Nominal resistances for the LRFD limit states were obtained by dividing the factored loads in Table 9 by the aforementioned resistance factors and an axial group efficiency factor of 1.0 for both cases. The controlling (largest) nominal resistance at each support is presented in Table 11 along with corresponding pile design tip elevations and specified tip elevations. Table 11 is a pile data table for use on the contract plans.

The pile capacities for Strength Limit and Extreme Event demands are based on soil resistance only and may be further limited by the pile-head connection details and structural material strength.

**Table 11. Bridge Pile Data Table**

| Location | Pile Type | Nominal Resistance (kips) |  | Design Tip El. (ft) | Spec. Tip El. (ft) |
|---|---|---|---|---|---|
|  |  | Compression | Tension |  |  |
| **Sepulveda Blvd GS – Busway Bridge** |  |  |  |  |  |
| Abutment 1 | 60" Dia. CIDH | 860 | 0 | (a) 627, (c) 672, (d) 647 | 627 |
| Bent 2 | 120" Dia. CIDH | 4,720 | 0 | (a) 623, (d) 612 | 612 |
| Bent 3 | 120" Dia. CIDH | 5,580 | 0 | (a) 637, (d) 612 | 612 |
| Bent 4 | 120" Dia. CIDH | 5,580 | 0 | (a) 637, (d) 612 | 612 |
| Abutment 5 | 60" Dia. CIDH | 1,020 | 0 | (a) 621, (c) 666, (d) 647 | 621 |

Notes:

1. Design Tip Elevations are controlled by the following demands: (a) Compression, (b) Tension, (c) Settlement, and (d) Lateral Load.
2. Specified Tip Elevations shall not be raised above the Design Tip Elevations for Settlement and Lateral Load.
3. Nominal Resistance in tension not provided, as the tension load is zero (see Table 9) and does not govern pile length.

### 8.1.5 Pile Settlement

Per Table 8, the permissible settlement at the pile cut-off elevations under the Service Limit state is 1 inch. Based on preliminary service loads provided by the designer and shown in Table 9, pile settlements under the Service Limit State loads are estimated to be less than 1 inch based on skin friction resistance. The actual settlement for the Strength and Extreme Event states are also estimated to be 1 inch or less based on design skin friction and limited end-bearing if any (Section 8.1.3). The design tip elevations for settlement are shown in Table 11.

### 8.1.6 Lateral Pile Capacity

Lateral pile capacity evaluation depends on a number of parameters, including the ground condition, pile cut-off elevation, pile fixity at the bent cap (pinned or fixed), elevation (below ground, above ground), magnitude (lateral load or displacement), direction of loading, structural section properties, and allowable pile deflection. The pile cut-off elevations shown in Table 8 will be below finished grades. For service load design, the lateral allowable pile deflection is usually small and linear-elastic soil behavior can be assumed. For ultimate load design (typically under seismic conditions), piles are usually designed for larger deflections and non-linear behavior of the surrounding soil should be considered.

Lateral pile design can be performed using LPILE (Ensoft, 2019) or other software to model any of these cases using the soil parameters provided in Table 10. For lateral pile interaction, Table 12 provides group reduction factors (pile group efficiency) to be applied as “p-multipliers” full-length on each pile in the group. Factors may be interpolated for intermediate pile spacings.

Figures 11 and 12 show pile solutions for the Sepulveda Station structure Abutments and Bents, respectively. The above solutions are provided for requested load cases and were based on an elastic pile section of concrete with a compressive strength of 4,000 psi, uniform diameter, no steel casing, and a free-head condition. The solutions incorporate average group efficiencies based on the pile layouts shown on the design plans and can be used for pile loadings in the bridge longitudinal or transverse directions. Separate solutions for each loading direction and other pile group configurations can be obtained by running individual LPILE solutions applying p-multipliers in Table 12. The pile design tip elevations resulting from the above analyses were included in Table 11.

For single-column bents, a 20% increase in pile length should be applied to the critical pile length calculated due to lateral loads following Caltrans Bridge Design Practice Manual (2015). The soil parameters and soil support (p-y) curves to be used can be developed using the parameters shown in Table 10.

**Table 12. Lateral Group Effects**

| Pile Spacing On-Center | P-Multiplier Row 1 | P-Multiplier Row 2 | P-Multiplier Row 3+ |
|---|---|---|---|
| **Pile Group With 2+ Rows<br>Loading in Bridge Longitudinal or Transverse Direction** | | | |
| 2D | 0.60 | 0.35 | 0.25 |
| 3D | 0.75 | 0.55 | 0.40 |
| 5D | 1.00 | 0.85 | 0.70 |
| 7D | 1.00 | 1.00 | 0.90 |
| 8D | 1.00 | 1.00 | 1.00 |
| **Pile Group With Single Row<br>Loading in Bridge Longitudinal Direction** | | | |
| 2.5D | 0.80 | | |
| 3D | 0.90 | | |
| 4D | 1.00 | | |

Note: D= Pile Diameter

### 8.1.7 Construction Considerations

The CIDH piles should be constructed in accordance with Section 49-3 of the Caltrans Standard Specifications (Caltrans, 2015) and Metro Baseline Specifications. To improve CIDH pile construction, a concrete cover over steel reinforcement should be provided in accordance with Table 10.8.1.3-1 of AASHTO-CA LRFD BDS. Feasible pile construction methods available to the designer builder include “dry construction”, “wet construction”, and the use of casing.

“Dry construction” is feasible if groundwater is not encountered or the open hole can be safely dewatered.

Based on existing geotechnical data (Section 4.3), groundwater is expected to be encountered during pile drilling. Where groundwater is encountered within the pile length, “wet” construction such as using the slurry displacement method and/or casing would be necessary. Caltrans standard practice for “wet” construction requires CIDH piles with diameter of 24 inches or larger to incorporate PVC tubes attached to the steel reinforcement to conduct gamma-gamma testing in accordance with Caltrans Memo to Designers 3-1 (2014).

The utility plans suggest the Sepulveda Boulevard bridge supports at Abutment 1 to Bent 4 potentially conflict with a 36-inch diameter existing storm drain. Buried utilities adjacent to proposed pile foundations should be either protected in-place or permanent pile isolation casing such as steel or sonotube could be used in the upper portion of the piles down to the bottom elevation of the utility. If casing is used, it should either be placed tight in the drilled hole, or placed in an oversized hole and the annulus between casing and soil should be tremie-grouted.

The preferred casing installation is by working in (pushing and twisting with the Kelly bar or other acceptable means and method) tight into the ground. Driving casing is only feasible if noise and ground vibration are properly addressed and/or do not control. For permanent casing, Corrugated Metal Pipe is recommended to be placed in an oversized drilled hole not more than 2 feet larger than the side of the drilled pile and should be embedded a minimum of 5 feet below the construction joint. The annulus should be grouted per Section 49-3.02B(5) and C(6) of the Caltrans Standard Specifications (2015) in order to include geotechnical skin friction for pile capacity within the casing length. CMP should not be included in the structural capacity calculation. Alternatively, smooth steel casing or sonotube is feasible if adjacent buried utilities are protected in place or relocated.

The shallow soils at the proposed bridge sites predominantly consist of cohesive soils. The soil borings also indicate that presence of variable amounts of fines, silts and gravel. Layers of cohesionless materials could have caving potential in a drilled open hole. The contractor should be prepared to have appropriate means and method available to control soils susceptible to caving which can include temporary steel casing or drilling fluid. If temporary casing is used, it should have an outer diameter equal to or exceeding the pile diameter. Vibratory equipment is not recommended to avoid adverse effects on skin friction and leaving the available bond strength uncertain. Temporary casing should be pulled as the concrete is being poured while always maintaining at least a 5-feet head of concrete inside the casing. Other means and method to control caving include placement of soil cement slurry within the caved zone with a strength that is similar to that of the surrounding soils, then drilling through the slurry after it has reached initial set.

Loose soils should be properly cleaned from the bottom of the CIDH excavations. The borings should be inspected with contractor assistance (such as through the use of the miniSID device or other available contractor means and method for verifying the condition at the bottom of CIDH excavations) and approved by a geotechnically qualified person prior to the installation of reinforcement. Extreme care in drilling, placement of steel, and the pouring of concrete will be essential to avoid excessive disturbance of pile excavation walls. The pile reinforcing cage should be installed and the concrete pumped expeditiously after drilling is completed. No pile excavation should be drilled adjacent to another pile in the same pile group until the concrete in the other pile has attained its initial set.

## 8.2 Bridge Abutments

At the Sepulveda station bridge site, the abutments consist of earth retaining walls on pilecaps. Current design plans do not indicate the abutment wall configuration. Seat-type bridge abutments include a backwall that retains approach fills.

### 8.2.1 Wall Design

Lateral Earth Pressures. For design of abutment walls that retain level and compacted backfill, and that are free to move laterally at the top, a static active lateral earth pressure of 36 psf per foot of depth is recommended ($K_a$=0.3). If wall displacement is restrained, an at-rest pressure of 55 psf per foot of depth can be used ($K_o$=0.45). A uniform lateral pressure due to vehicular loads equivalent to a vertical pressure produced by at least 2 feet of earth, should be added to the above lateral earth pressure.

For earthquake loading, an incremental seismic active earth pressure of 15 psf per foot of depth can be used. This value was determined based on the Mononobe-Okabe/Trial Wedge method with a seismic coefficient equal to one-half the PGA from Section 7.1 for the Caltrans seismic design spectrum.

Passive Earth Pressure. Under seismic loading, an ultimate passive earth pressure of 5.0 ksf may be used for the approach backfill and abutment backwall with a design height of 5.5 feet or greater per Section 6.3.1 of Caltrans SDC 2.0 (2019). The horizontal movement at which the maximum passive pressure is expected to be fully mobilized can be determined following the procedure outlined in Section 7.8.1 of the Caltrans SDC (2013) and Section 6.3.1 of Caltrans SDC 2.0 (2019).

### 8.2.2 Construction Considerations

The abutment walls retain structural backfill and also reinforced backfill placed for the adjacent MSE walls. Recommendations for structural backfill are provided below. Recommendations for the MSE wall backfill are provided in Section 8.4.

Backfill Requirements. Structure backfill material placed behind the concrete bridge abutment walls should be in accordance with Section 19-3 of the Caltrans Standard Specifications (2015) and Caltrans Standard Plans (2015) and Metro Baseline Specifications.

The on-site soils can only be re-used as compacted fill if they meet the standard requirements for Structure Backfill and are not corrosive. Any fine-grained native soils encountered during grading should not be placed behind abutment walls.

Backfill should be compacted in accordance with Section 19-5 of the Caltrans Standard Specifications. Backfill should be placed in loose lifts not exceeding 8 inches in thickness, moisture-conditioned to near optimum moisture content, and compacted to at least 95% relative compaction. The relative compaction should be based on the maximum density determined by California Test 216. Jetting or flooding to compact backfill is not permitted. Heavy compaction equipment, such as vibratory rollers, dozers, or loaders, should not be used adjacent to the abutment walls in order to avoid damaging the walls due to large lateral earth pressures.

Backdrain Requirements. Backdrains should be installed behind the walls to relieve hydrostatic pressure. Backdrains can be constructed as applicable in accordance with weepholes and wall drains with filter/drainage materials can be constructed in accordance with Sheet B0-3 per Caltrans Standard Plans (2015) or the geocomposite drain alternative per Section 6 of the Caltrans Bridge Design Aids (1992), perforated plastic pipe surrounded by gravel and wrapped in filter fabric placed near the bottom of the wall with adequate outlets, or prefabricated drain composites may be substituted.

## 8.3 Shallow Foundations

### 8.3.1 Foundation Type

Design of structural attachments to the Sepulveda Blvd Station such as escalators, elevators, emergency egress staircases, and equipment and maintenance rooms etc., should follow Metro standards, California Building Code (CBC, 2016) and City of Los Angeles Building Code (2017).

These structures may be supported on conventional shallow foundations consisting of spread footings or mat foundations depending on the foundation sizes and loads. The foundations may be supported by existing natural clay soils or compacted import structural fill material. Any existing uncertified fill should either be removed and recompacted or replaced with properly compacted fill.

### 8.3.2 Bearing Capacity

Footings with a minimum embedment of 2 feet and a minimum width of 1.5 feet may be designed using an allowable bearing pressure of 2,500 psf. For footings with a minimum embedment of 4 feet, an allowable bearing pressure of 4,000 psf can be used. The allowable bearing pressure may be increased by one-third for temporary loads associated with wind or seismic loading.

### 8.3.3 Lateral Resistance

Lateral loading on the foundation can be resisted by a combination of friction between the bottom of footing or slab and the foundation soil, and passive soil resistance mobilized against the vertical face of the footing. For preliminary design of footings placed on native medium stiff clays and silts or compacted fill, an allowable passive earth pressure of 300 pounds per cubic foot (pcf) and an allowable coefficient of friction of 0.3 can be used. Both design parameters include a factor of safety of 1.5 and can be combined without reduction.

### 8.3.4 Settlement

Structural loads were not available at the time of this report. Conventional shallow foundations due to the allowable bearing pressure of 4,000 psf are expected to settle less than 1.5 inches. Differential settlements are estimated to be less than 1 inch over a horizontal distance of 40 feet between adjacent footings. Large structural mat foundations imposing an allowable bearing pressure up to 4,000 psf are expected to settle less than 3 inches. In addition, liquefaction settlement as discussed in Section 5.5 should be considered when selecting foundation type. Foundations will be evaluated during final design when dimensions, depths and loads become available. Although not anticipated, if static and seismic settlements based on final design loads are too large for shallow foundations, deep foundations can be considered for support of the minor structures.

### 8.3.5 Modulus of Subgrade Reaction

For preliminary design, mat foundations can be designed for a unit subgrade modulus of 100 pounds per cubic inch (pci) or a size-adjusted subgrade modulus of 25 pci. The final modulus will be determined interactively with structural design depending on the actual size and structural loads.

### 8.3.6 Construction Considerations

Based on limited testing, the expansion index of the shallow clay and silt soils was found to be low. If supplemental geotechnical field investigation confirms this finding, then new footings and slabs-on-grade design will not require special structural design for expansive soils.

#### 8.3.6.1 General.

Site preparation and earthwork for shallow foundations construction and backfill, utility installation, and general site grading should be performed in accordance with requirements of the Metro Baseline Specifications, Standard Specifications for Public Works Construction (Greenbook, 2010 or later), and City of Los Angeles building code, and as well as applicable codes, health and safety regulations and other local, State or federal specifications, and the recommendations in this report. Excavations and cuts should be inspected during grading. Any uncertified fill soils should be excavated and recompacted or replaced with properly compacted fill. Areas to receive fill should be cleared of all vegetation, debris, loose or soft soils, and any other deleterious material to expose a firm and unyielding ground surface.

On-site materials can be excavated using conventional heavy-duty earth-moving equipment. Excavations and any compacted fill placed for the project should be observed, monitored, and tested by qualified geotechnical personnel during grading. Field and laboratory tests should be conducted in accordance with ASTM methods as specified in the Greenbook and any other applicable testing requirements such California Test methods.

For unsupported cuts in existing soils, the recommended maximum gradient should not exceed 1H:1V. Appropriate measures should be taken to prevent damage to adjacent existing structures and utilities. Temporary excavations must be properly cut, sloped or shored in accordance with all applicable codes and regulations including OSHA standards. Design of a shoring system can be conducted with input from a geotechnical engineer. No excavation should be performed below an imaginary plane inclined at 1:1 from the edge of any existing foundation and other structures including roadways without providing adequate support for the existing foundation. If a trench shoring design and safety plan is required, the geotechnical consultant should review the plan to confirm that recommendations presented in this report have been applied to the design.

In addition, soil stockpiles or other storage loads and vehicular and construction equipment should be set back a minimum distance of 5 feet from the edge of the slope.

#### 8.3.6.2 Subgrade Preparation

Complete removal of compressible surficial materials including vegetation, topsoil, loose or soft alluvium, dry or saturated soil, wet, unstable, or otherwise unsuitable material such as uncertified fill is required prior to fill placement. Areas to receive fill for grading should be scarified to a depth of at least 6 inches, moisture-conditioned as necessary to near-optimum moisture content, and proof-rolled to a firm and unyielding subgrade. Probing should be performed by a geotechnical field personnel to identify the presence of any loose or soft zones after proof-rolling.

#### 8.3.6.3 Fill Placement

Existing fills that are undocumented, uncertified or found to be unsuitable should be removed.

Areas to receive fill should be cleared of all existing vegetation, debris, loose or soft soils, dry or wet materials, and uncertified fill or any other deleterious material to expose a firm and unyielding ground surface. Fills placed against existing, undisturbed soil should be properly keyed and benched per Greenbook or otherwise per Section 19-6.01 of the Caltrans Standard Specifications, as applicable. A minimum overexcavation of 2 feet is recommended within all areas to receive compacted fill supporting structures unless stated otherwise. The overexcavation is recommended to extend horizontally a minimum distance of 2 feet from edges of new fills or structures. A minimum overexcavation of 1 foot is recommended within all other areas to receive compacted fill unless noted otherwise. The overexcavation should extend horizontally a minimum distance of 1 foot from edges of new fills. Actual depths and extent of the required removals should be determined in the field by qualified geotechnical personnel based on local conditions. Excavation bottoms should be firm and unyielding prior to fill placement.

Prior to placing compacted fill, the exposed subgrade is recommended to be scarified to a minimum depth of 6 inches, moisture-conditioned as necessary to near-optimum moisture content, and compacted to at least 90% relative compaction based on maximum densities determined in accordance with ASTM D1557 or Caltrans CT-216 methods or equivalent, as applicable. Fill should be placed in uniform horizontal loose lifts not exceeding 8 inches in thickness, moisture-conditioned to near-optimum moisture content, and compacted to at least 90% relative compaction. If hand-directed mechanical tampers are used for compaction, the loose lift thickness should not exceed 6 inches. Observation, probing, and testing must be performed by qualified geotechnical personnel to verify the degree of compaction.

Areas that are excavated below finish grade or that are disturbed by construction activities should be overexcavated to a depth where undisturbed material is exposed. Finish grades should be reestablished using fill properly compacted to a minimum of 90% relative compaction.

Unless stated otherwise, all fill is recommended to be compacted to a minimum relative compaction of 90% based on maximum dry density determined in accordance with ASTM D-1557 or Caltrans CTM-216 or equivalent. If a structure to be supported is sensitive to settlement, the minimum compaction requirement could be increased to 95% of the maximum dry density.

Footings. The excavation bottom should be cleaned of loose soil and debris. The excavation bottom should be inspected by qualified geotechnical personnel to confirm the presence of a competent and unyielding subgrade prior to placement of concrete. If the bottoms of the excavations expose loose or soft fine-grained soil, the soil should be removed at least 1 foot below the bottom of the excavation to expose undisturbed material. The horizontal limits of overexcavation from each edge of the footing should be at least 1 foot. The overexcavation should be backfilled with compacted select granular material.

Where conventional backfill and compaction operations not practical or feasible due to limited space, sand-cement slurry or pea gravel, or other selected backfill may be used. Sand-cement slurry should consist of at least 1½ sack of cement per cubic yard. Pea gravel or other materials should be placed and compacted using vibratory or mechanical equipment under the supervision of a geotechnically qualified person.

A vapor retarder is recommended to reduce the potential for moisture transmission through slabs. The installation of the barrier should comply with ASTM E 1643-09, Section 7.2 of the American Concrete Institute 302.2R, and local city requirements. For example, the City of Los Angeles recommends that concrete floors be placed on 4 inches of coarse aggregate or a 2 inch bed of sand over a vapor barrier. A 2-inch bed of sand should be placed between the gravel and the vapor retarder to decrease the possibility of damage to the membrane. If needed, a 2-inch-thick layer of sand can be placed over the vapor retarding membrane and below the concrete slab to reduce slab curling. In accordance with ACI 302.2R-06, the material should comply with ASTM E 1745 requirements and have a permeance of less than 0.01 perms per ASTM E96.

Hardscape and flatwork should be supported on properly compacted subgrade.

#### 8.3.6.4 Fill Materials

For backfill of footings or walls, imported granular soils can be used with a low expansion potential and a plasticity index less than 15%. On-site soil should only be re-used for fill provided all applicable requirements for fill in the Greenbook, or Caltrans Standard Specifications as appropriate, are met. Fill material should not contain organic material, rocks greater than 4 inches in greatest dimension, debris and other deleterious materials. All soils should be tested and approved by a geotechnically qualified person. Import soils are recommended to be tested and approved prior to delivery to the project site.

The on-site soils can potentially be re-used as compacted structure backfill if they meet the standard requirements for Structure Backfill and are not corrosive or expansive. Fine-grained native soils encountered during grading should not be placed behind abutment walls. The sandy soils encountered in boreholes are not expansive.

Any compacted fill placed for the project should be observed, monitored, and tested by qualified geotechnical personnel during grading. Field and laboratory tests should be conducted in accordance with ASTM or California Test methods and any other applicable testing requirements.

### 8.3.6.5 Observation and Testing

Qualified geotechnical personnel will observe subgrade preparation. Sufficient in-place field density tests should be performed during fill placement and in-place compaction to evaluate the overall compaction of the soils. Soils that do not meet minimum compaction requirements should be reworked and tested prior to placement of any additional fill.

Review and Inspection. Recommendations contained in this report are based on current design information. The geotechnical consultant should review the final construction plans and specifications in order to confirm that the general intent of the recommendations contained in this report have been incorporated into the final construction documents. Recommendations contained in this memorandum may require modification or additional recommendations may be necessary based on the final design, construction of structure foundations, and final slope restoration/grading.

Inspections are recommended to be performed by qualified geotechnical personnel during the following stages of construction:

- Grading operations, including excavations and placement of compacted fill,
- Temporary backcuts and shoring installation,
- Foundation excavations,
- Pile drilling prior to placement of steel reinforcement,
- Footing excavations,
- Exposure, removal or installation of support of buried utilities or structures,
- Placement and compaction of utility trench bedding and backfill,
- Preparation of pavement subgrade and placement of aggregate bases,
- Backdrain construction, and
- When any unusual subsurface conditions are encountered.

## 8.4 Mechanically Stabilized Earth (MSE) Walls

The MSE walls for the project are anticipated to be up to about 30 feet high with width varying from about 40 feet at its termini to about 66 feet at the bridge.

### 8.4.1 General

MSE walls are engineered earth retaining structures that consist of compacted fill layered with soil reinforcement to create a stable earthen embankment. A precast concrete panel facing is used to prevent the soil from raveling out between the layers of reinforcement. The backfill usually consists of import engineered granular backfill that is compacted to the specified compaction level. The soil reinforcement could consist of either metal strips/mesh or geogrid that extends from the wall facing to a certain distance to provide internal stability (typically 70% of the wall height). The concrete panel facing is supported on a small leveling pad (“footing”) that has a minimum embedment to achieve the necessary bearing capacity and to aid in panel erection.

Both the internal and external stability of the wall system should be evaluated. The internal stability of the MSE wall system is the responsibility of the MSE wall designer as it requires that the design (tension and pullout resistance of reinforcement elements) be completed and dimensions and short-term/long-term properties of the materials used for reinforcement and backfill be established. The external stability evaluation involves analyses for overturning, sliding, bearing capacity and global stability which are discussed later in this section.

The weight of the MSE wall will induce additional load on the subsurface soil and result in settlement. The settlement will be non-uniform as the additional stresses induced are a function of the embankment fill height. The estimated settlement of the embankment will induce downdrag forces on the pile foundations planned at the abutments (as discussed in Section 8.1.4). As the settlement in fine grained soils will be relatively slow, the MSE wall will experience some settlement even after construction due to ongoing compression of subsurface soils. The site can be pre-loaded to the extent possible, to accelerate the settlement, however, MSE wall will experience some settlement over time. The need for preloading and the settlement the MSE wall will experience should be evaluated during the final design.

Furthermore, the estimated settlement beneath the embankment should be evaluated with respect to the impact on any existing and proposed underground utilities as well as existing structures, such as the existing industrial and commercial buildings immediately adjacent to the embankment. If the estimated settlement is determined to be excessive, light weight material such as EPS Geofoam (Geofoam, or equivalent), may be used as backfill for the embankment. A settlement monitoring program should be implemented (1) to establish a baseline reading and the condition of existing structures and (2) to monitor the effects of the embankment construction on existing adjacent structures and underground utilities.

The borings and laboratory testing of samples indicate that the existing granular fill soils within 5 feet of the ground surface may have potential for hydrocollapse upon saturation. Additional investigations in the future phases of the project will be useful in confirming if the hydrocollapse potential is localized and the required depth of soil improvement, if needed.

### 8.4.2 Properties of Reinforced Earth

For preliminary design purposes, the following parameters may be used for the granular backfill:

- Cohesion (c) = 100 pounds per square foot
- Angle of Internal Friction ($\phi$) = 34 degrees
- Unit Weight = 120 pounds per cubic foot
- Static Active Earth Pressure Coefficient ($K_a$) = 0.28
- Static Active Earth Pressure = 34 pounds per cubic foot
- PGA = 0.663g (for Caltrans 975-year event)
- Horizontal Seismic Coefficient ($K_h$) = 1/3 * PGA = 0.221
- Seismic Earth Pressure Coefficient ($K_e$) = 0.12
- Seismic Earth Pressure = 15 pounds per cubic foot

The above design soil parameters should be considered as the minimum requirement in selection of the import backfill material to construct the embankments. The import material should be a fee-draining (coarse-grained) material. The strength parameters for the MSE wall backfill were assumed per Section 11.10.6.2 of the AASHTO-CA LRFD BDS and Caltrans Bridge Standard Detail Sheets (XS-sheets) for MSE walls. The horizontal coefficient for seismic earth pressure computation was taken as the greater of $K_h$ = 0.2 and one-third of the PGA recommended per Caltrans practice for MSE walls. The earth pressure was computed using Mononobe-Okabe method as recommended in Section A11.3.1 of AASHTO-CA LRDF BDS.

The following design information as shown in Tables 13 and 14 per Caltrans cannot be developed at this time; such information can be developed in the future phases of the project, particularly in the 100% design phase.

**Table 13. Design Tables for MSE Wall Design**

| MSE Station (ft) | Design Height (H) (ft) | Bottom of Leveling Pad Elevation (ft) | Base Width (B) (ft) | Minimum Embedment Depth (ft) |
|---|---|---|---|---|
| | | | | |
| | | | | |
| | | | | |

Table 14. Foundation Data for MSE Wall Design

| MSE Station (ft) | Service Limit State | | | Strength Limit State | | | Extreme Limit State | | |
|---|---|---|---|---|---|---|---|---|---|
| | Effective Base Width (ft) | Vertical Bearing Stress (psf) | Calculated Settlement at Vertical Bearing Stress (in) | Effective Base Width (ft) | Vertical Bearing Stress (psf) | Factored Bearing Resistance (psf) | Effective Base Width (ft) | Vertical Bearing Stress (psf) | Factored Bearing Resistance (psf) |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |

### 8.4.3 Bearing Capacity

The reinforced soil mass along its basewidth typically has a minimum embedment depth (about 1 foot) to the top of the leveling pad that supports the wall facing. The natural soils at the foundation level are generally stiff and have sufficient bearing capacity to support the additional earth loads from construction of the MSE wall.

The wall facing will be supported on a small continuous footing/leveling pad (about 1 to 2 feet wide and an embedment depth of 1 to 2 feet below adjacent grade or greater if larger bearing capacity is needed). Footings with a minimum embedment of 2 feet and a minimum width of 1.5 feet may be designed using an allowable bearing pressure of 2,500 psf. The allowable bearing pressure may be increased by one-third for temporary loads associated with wind or seismic loading. If unsuitable soils (existing fill) are encountered, the soils shall be overexcavated and recompacted or replaced with properly compacted fill. The compacted fill layer should extend beyond the footing to a distance equal to the depth of the compacted fill. Where conventional backfill and compaction operations not practical or feasible due to limited space, sand-cement slurry or pea gravel, or other selected backfill may be used. Sand-cement slurry should consist of at least 1½ sack of cement per cubic yard. Pea gravel or other materials should be placed and compacted using vibratory or mechanical equipment under the supervision of a geotechnically qualified person.

### 8.4.4 Sliding and Overturning

Lateral loads can be resisted by soil friction at the base of the MSE wall between granular backfill and foundation soils. An ultimate coefficient of friction of 0.35 can be used between the MSE wall backfill and foundation soils. Since the MSE wall is a gravity-type wall, sliding and overturning demand is not anticipated to govern the design. If needed, the MSE wall basewidth and embedment can be increased such that adequate factors of safety are achieved for sliding and overturning.

### 8.4.5 Settlement

Settlement analysis was performed using Settle3D version 4.0 program by Rocscience (2018) – a 3-dimensional program for the analysis of settlement and consolidation under foundations, embankments and surface excavations. The consolidation test results were reviewed and compression and recompression indices (Cc and Cr) were estimated for the fine-grained materials; for the granular materials, Young's modulus based on SPT blow counts was computed and used in the analysis.

Based on the preliminary settlement analyses performed, the maximum ground settlement under the embankment is estimated on the order of 5 to 6 inches, the majority (90%) of which is expected to occur within one year of construction. The differential settlement is estimated to be about 1 inch for every 200 lineal feet along/across the embankment, which is within tolerable limits specified in Section 11.10.4 of AASHTO BDS for MSE walls with segmental concrete block facing. If a full height precast concrete facing panel is used (which is not anticipated), then the acceptable total and differential settlement may be more restrictive than for flexible segmental wall. A limiting differential settlement between the front and back of the wall per Section 11.10.4 of the AASHTO LRFD BDS (2012) should also be considered so the deformation/rotation of the wall facing and reinforcement connection to wall facing are not affected.

When additional borings are performed in the future phases of the project, settlement estimates provided herein can be re-evaluated and the effect on the structures supported above the MSE wall as well as those adjacent to the MSE wall and subsurface utilities should be evaluated.

The majority of the settlement under the weight of the MSE wall was computed in the upper 30 to 40-foot thick clay and is expected to happen during construction and within one-year of completion of the MSE walls. The estimated settlement of the embankment will induce downdrag forces on the pile foundations planned at the abutments (as discussed in Section 8.1.4). The site can be pre-loaded to the extent possible, to accelerate the settlement, however, MSE wall will experience some settlement even after construction. The need for preloading and the settlement the MSE wall will experience should be evaluated during the final design.

A settlement monitoring program can be implemented from the beginning of the construction of the MSE wall to document the rate of settlement to evaluate the overall integrity of the MSE wall system upon completion and to make a decision for construction of the concrete cap beams and other structures supported on them. If it is desired to accelerate the settlement process, the site can be pre-loaded

In addition to the static settlement, the MSE wall may be subject to liquefaction and seismically induced settlement as discussed in Section 5.5. Since MSE wall systems can accommodate relatively large total and differential settlement and given the history of satisfactory performance of MSE walls in past earthquakes (see Sections A11.2 of AASHTO LRFD BDS), the MSE wall designer should review the total static-plus-settlement estimates provided herein and if unacceptable, consider ground improvement techniques to improve the soil.

### 8.4.6 Earth Pressures

For design of MSE wall systems, where the surface of the backfill is level, it can be assumed that drained soils will exert a lateral pressure equal to that developed by a fluid with a density of 34 pounds per cubic foot. The recommended earth pressure is based on the active earth pressure coefficient stated in Section 8.4.1. In addition to the recommended earth pressure, the walls should be designed to resist any applicable surcharges due to storage or traffic loads. The traffic surcharge due to vehicular traffic should be taken as a uniform lateral pressure of 100 pounds per square foot, acting as a result of an assumed 300 pounds per square foot surcharge behind the walls due to normal vehicular traffic. A greater lateral pressure shall be used if prescribed by Metro or Caltrans design standards.

In addition to the above-mentioned lateral earth pressures, walls should be designed to support a seismic active pressure. As stated earlier in Section 8.4.1, a seismic active pressure in the form of a triangular (fluid) distribution with the maximum pressure equal to 15H pounds per square foot, where H is the wall height in feet, is recommended. The earth pressure was computed using the Mononobe-Okabe method following Section A11.3.1 of AASHTO LRDF BDS.

### 8.4.7 Global Slope Stability

A global slope stability analysis of the MSE wall was performed using GSTABL7 Version 2.005.2A (with STEDwin) – 2D Limit Equilibrium Slope Stability Analysis System software by Gregory Geotechnical (GSTABL, 2012). The stability of the fill slope was analyzed using the Modified Bishop method. The program uses a Critical Failure Surface Searching Method with a random technique for generating circular surfaces. A minimum of 500 trial surfaces were generated to identify the critical failure surface.

The analysis was performed for static and seismic loading conditions considering undrained and drained condition for static condition to represent the short-term and long-term conditions. For seismic loading, only undrained strength was considered for the clays. The MSE wall cross-sections at three stationing's presented on drawing C-301 - "Busway Typical Cross-sections (Sheet 1 of 2)" of the 15% plan set were utilized as they represent the various wall configurations along this segment. The surcharge pressure from the freeway vehicular traffic (equivalent to 240 pounds per square foot or 2 feet of soil weight, per Caltrans Standard Plans) was also considered in the analysis. The soil properties presented in Section 4.1.1 were used for reinforced fill and the properties presented in Table 12 were used for the foundation soils.

For seismic analysis, a horizontal seismic coefficient ($k_h$) was computed for the three hazards levels – namely MDE and ODE (Metro MRDC) and Caltrans design ground motion (i.e., event with a 975-year return period). The estimated seismic coefficient taken as one-third of the PGA) are presented in the following Table 15:

**Table 15. Seismic Coefficient for Slope Stability Evaluation**

| Design Earthquake | Magnitude (Mw) | PGA | $K_h$ |
|---|---|---|---|
| ODE (150 year event) | 6.55 | 0.359g | 0.12 |
| MDE (2475 year event) | 6.85 | 0.957g | 0.36 |
| Caltrans (975 year event) | 6.75 | 0.663g | 0.22 |

*Factor of safety for static and seismic conditions, respectively

Based on the slope stability analyses, the factors of safety for static and seismic conditions for the governing condition were greater than 1.5 and 1.1, respectively. The computed factors of safety are acceptable.

### 8.4.8 Drainage

Proper drainage should be provided to ensure long-term performance of the MSE wall system. The grades near the toe of the MSE wall as well as above at the finished surface should drain water away from the MSE wall system. Although MSE wall is constructed with permeable granular material with joints between segmental concrete panels, it is recommended that a properly sized underdrain wrapped in filter fabric be provided near the base of the base to drain any water seepage/flow from the finished driving surface.

### 8.4.9 Construction Considerations

The MSE wall backfill should be properly compacted and verified that it meets the design compaction specification (both dry density and moisture content). During construction, the grade at the top of surface and toe of the wall should be positively drained to prevent ponding or erosion of the backfill material. All requirements and specifications in Metro MRDC, Metro Baseline Specifications and Caltrans standards, whichever is applicable should be followed.

# 9 Additional Investigations

The recommendations provided in this 30% GDM are based on limited geotechnical investigations and should be used only for preliminary design and costing. Additional investigations consisting of borings and CPTs including field and laboratory testing should be performed in future phases of the Project in accordance with requirements of MRDC (Metro, 2017) to confirm the conclusion and recommendations presented herein.

Additional investigations are recommended to consist of the following: for stations, a minimum of one boring and/or CPT at every support, staggered left and right of the bridge structure, and one to two borings at each abutment. If a single large diameter pile is used for column support, it is recommended that one boring be performed at each large-diameter (large demand) column location to obtain more specific subsurface information and to potentially prevent contractor claims (changed ground condition). Such borings should be drilled to a depth of at least 20 feet below the required pile length based on demands. Based on current information, borings to a depth of 120 feet appear to be sufficient. Furthermore, pile load tests should be considered if the drilled shafts are designed to include capacity from friction and from end bearing, particularly if large diameter piles with large demands are planned.

Explorations along MSE walls are recommended to consist of additional borings and/or CPTs to further evaluate static and liquefaction settlement. Such borings may be spaced at 500 to 1,000 feet and should extend to a depth of 75 to 100 feet below existing grade.

# 10 Bibliography

American Association of State Highway and Transportation Officials (AASHTO), 2012, AASHTO LRFD Bridge Design Specifications, Fifth Edition, Washington, DC.

Bray, J, D., and Sancio, R, D., , 2006, Assessment of the Liquefaction Susceptibility of Fine-Grained Soils, Journal of Geotechnical and Geoenvironmental Engineering, Volume 132 Issue 9 - September 2006.

Bryant/Hart, 2007

Caltrans, California Test Methods (various dates).

Caltrans, 2018, “Corrosion Guidelines, Version 3.0:” Division of Engineering Services, Materials Engineering and Testing Services, Corrosion Branch, March, 2018.

California Department of Transportation, 2017, ARS Online Web Tool V2.3.09. http://dap3.dot.ca.gov/ARS_Online/

Caltrans Department of Transportation, 2015, Bridge Design Practice Manual.

California Department of Transportation, 2015, “Standard Specifications.”

California Department of Transportation, 2014, “Memo To Designers 3-1,” June, 2014.

California Department of Transportation, 2013, Seismic Design Criteria, Version 1.7, April 2013.

California Department of Transportation, 2012, “Methodology for Developing Design Response Spectrum for Use in Seismic Design Recommendations,” November, 2012.

California Department of Water Resources, 2003, “California’s Groundwater,” Bulletin 118, Update 2003.

California Division of Mines and Geology (CDMG), 1997, revised 2005, Seismic Hazard Zone Report for the Van Nuys 7.5-Minute Quadrangle, Los Angeles County, California, California Division of Mines and Geology, Seismic Hazard Zone Report 08.

California Division of Mines and Geology, 1998, “State of California Seismic Hazard Zones, Van Nuys Quadrangle, Official Map,” released February 1, 1998.

California Division of Oil, Gas and Geothermal Resources (DOGGR), 2018, DOGGR Well Finder, http://www.conservation.ca.gov/dog/Pages/Wellfinder.aspx

California Geological Survey, 2018a, “Information Warehouse,” Online Regulatory Maps, http://maps.conservation.ca.gov/cgs/informationwarehouse/, Accessed September 25, 2018.

California Geological Survey, 2018b, “Earthquake Fault Zones, A Guide for Government Agencies, Property Owners/Developers, and Geoscience Practitioners for Assessing Fault Rupture Hazards in California,” Special Publication 42, Revised 2018.

California Geological Survey, 2018c, Landslide Inventory, Online Database, http://maps.conservation.ca.gov/cgs/lsi/.

California Geological Survey, 2002, “GIS Files of Official Alquist-Priolo Earthquake Fault Zones, Southern Region,” CGS CD 2001-05, May 31, 2002.

California State Water Rights Board, 1962, “Report of Referee,” in the Superior Court of the State of California in and for the County of Los Angeles, The City of Los Angeles, a Municipal Corporation, Plaintiff, vs. City of San Fernando, a Municipal Corporation, et al., Defendants, no. 650079, v. 1, 258 p.

County of Los Angeles Department of Public Works, 2018, http://dpw.lacounty.gov/general/wells/

County of Los Angeles Department of Public Works, 2017, “Manual for Preparation of Geotechnical Reports.”

Diaz-Yourman & Associates, 2017, “Preliminary Geotechnical Report, Metro Orange Line Grade Separations, Los Angeles, California, Metro Contract Number PS4010-3041-DD-XX, Task Order PS61582003041,” Project No. 2016-038, June 21, 2017.

Earth Technology Corporation, 1993, “Geotechnical Investigation for Limited Preliminary Engineering Program, San Fernando Valley East-West Segment, Metro Red Line Project, Volume II,” prepared for Engineering Management Consultant, Project No. 93-4955, December 1993.

Ensoft Inc., 2019, LPILE Plus, A program for analyzing Stress and Deformation of a Pile or Drilled Shaft under Lateral Loading, Austin, Texas.

FEMA, 2008, “Flood Insurance Rate Map, Los Angeles County, California,” Panel 06037C1315F.

Federal Highway Administration (FHWA), 2010, Drilled Shafts: Construction Procedures and LRFD Design Methods, FHWA-NHI-10-016.

Field, E.H., Biasi, G.P., Bird, P., Dawson, T.E., Felzer, K.R., Jackson, D.D., Johnson, K.M., Jordan, T.H., Madden, C., Michael, A.J., Milner, K.R., Page, M.T., Parsons, T., Powers, P.M., Shaw, B.E., Thatcher, W.R., Weldon, R.J., II, and Zeng, Y., 2013, Uniform California earthquake rupture forecast, version 3 (UCERF3)—The time-independent model: U.S. Geological Survey Open-File Report 2013–1165, 97 p., California Geological Survey Special Report 228, and Southern California Earthquake Center Publication 1792, http://pubs.usgs.gov/of/2013/1165/.

Field, E.H., T.H. Jordan, and C.A. Cornell (2003), OpenSHA: A Developing Community-Modeling Environment for Seismic Hazard Analysis, *Seismological Research Letters*, **74**, no. 4, p. 406-419.

Gregory Geotechnical, 2012, GSTABL7 Version 2.005.2A- 2D Limit Equilibrium Slope Stability Analysis Program.

Greenbook, 2012, Standard Specifications for Public Works Construction.

Hitchcock, C. S. and Wills, C. J., 2000, “Quaternary Geology of the San Fernando Valley, Los Angeles County, California,” California Division of Mines and Geology Map Sheet 50.

Idriss, I.M., and Boulanger, R. W., 2008, Soil Liquefaction During Earthquakes, Earthquake Engineering Research Institute Monograph MNO-12.

Jennings, C.W. and Bryant, W.A., 2010, “Fault Activity Map of California,” California Geological Survey, Geologic Data Map Series No. 6, map scale 1:750,000.

LeRoy Crandall and Associates, 1972, “Report of Foundation Investigation, Proposed Building, Sepulveda Boulevard Near Erwin Street, Van Nuys District, Los Angeles, California,” for Federated Department Stores, Inc., Job No. A-71256-B, May 24, 1972.

Los Angeles, City of, 1996, “Safety Element of the General Plan,” accessed 2018.

Los Angeles County Department of Public Works, 2018, http://dpw.lacounty.gov/general/wells/

Los Angeles, County of, 2015, “General Plan 2035.”

Merriam, M., 2012, Caltrans Fault Database (V2b) for ARS Online, California Department of Transportation, Sacramento, CA.

Metro, 2017, Metro Rail Design Criteria (MRDC), Rev 4, Section 5 – Structural/Geotechnical, dated Nov 20, 2017.

Rocscience, 2018, Settle 3D Version 4.018, 3D Program for the Analysis of Settlement and Consolidation Under Foundations, Embankments and Surface Excavations.

Southern California Seismographic Network, 2017, Southern *California Earthquake Catalog,* http://www.scecdc.scec.org/ftp/catalogs/SCSN/.

Upper Los Angeles River Area Watermaster, 2017, Annual Report, 2015-16 Water Year: October 1, 2015 – September 30, 2016, Watermaster Service in the Upper Los Angeles River Area (ULARA), Los Angeles County, California.

URS, 2002, “Geotechnical and Environmental Report, San Fernando Valley Bus Rapid Transit Guideway from Warner Center to North Hollywood, City of Los Angeles, Los Angeles County, California,” May 10, 2002.

U.S. Geological Survey and California Geological Survey, 2006, “Quaternary Fault and Fold Database for the United States,” accessed 02-19-18, from USGS web: https://earthquake.usgs.gov/hazards/qfaults/

U.S. Geological Survey, 2018, https://earthquake.usgs.gov/hazards/interactive/

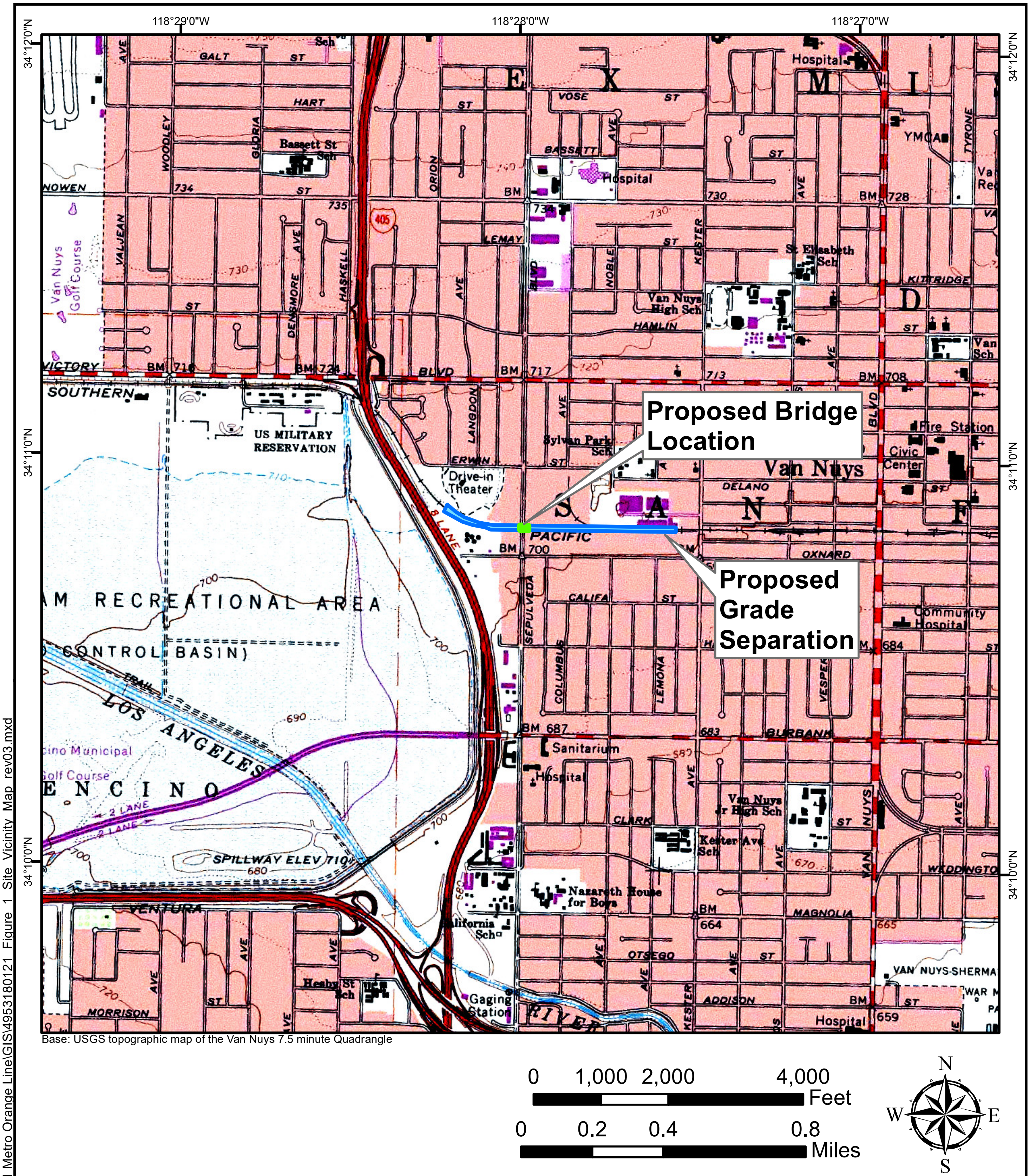
Youd/Idriss, 1997, Proceedings of NCEER Workshop on Evaluation of Liquefaction Resistance of Soils, National Center for Earthquake Engineering, Research, State University of New York at Buffalo, Technical Report NCEER-97-0022 dated December 31, 1997.

Youd, T & Idriss, I & Andrus, Ronald & Arango, Ignacio & Castro, Gonzalo & T. Christian, John & Dobry, Richardo & Finn, Liam & F. Harder Jr, Leslie & P. Koester, Joseph & S. C. Liao, Sam & F. Marcuson, William., (2001), Liquefaction Resistance of Soils: Summary Report from the 1996 NCEER and 1998 NCEER/NSF Workshops on Evaluation of Liquefaction Resistance of Soils, Journal of Geotechnical and Geoenvironmental Engineering, Volume 127 (10), October 2001.

Wood/EMI, 2018, Draft Geotechnical Data Report, Metro Orange Line – Sepulveda Boulevard Segment, report dated November 8, 2018.

ZIMAS, 2018, City of Los Angeles Department of City Planning Zone Information and Map Access System (ZIMAS), Accessed 10-08-19, from City of Los Angeles web: http://zimas.lacity.org/

# Figures



**Proposed Bridge Location**

**Proposed Grade Separation**

Base: USGS topographic map of the Van Nuys 7.5 minute Quadrangle

**Project Location**

Wood
Environment & Infrastructure Solutions, Inc.
6001 Rickenbacker Road
Los Angeles, California 90040
Tel: 323.889.5300
Fax: 323.721.6700

Proposed Sepulveda Grade Separation
Metro Orange Line Improvements
Los Angeles, California

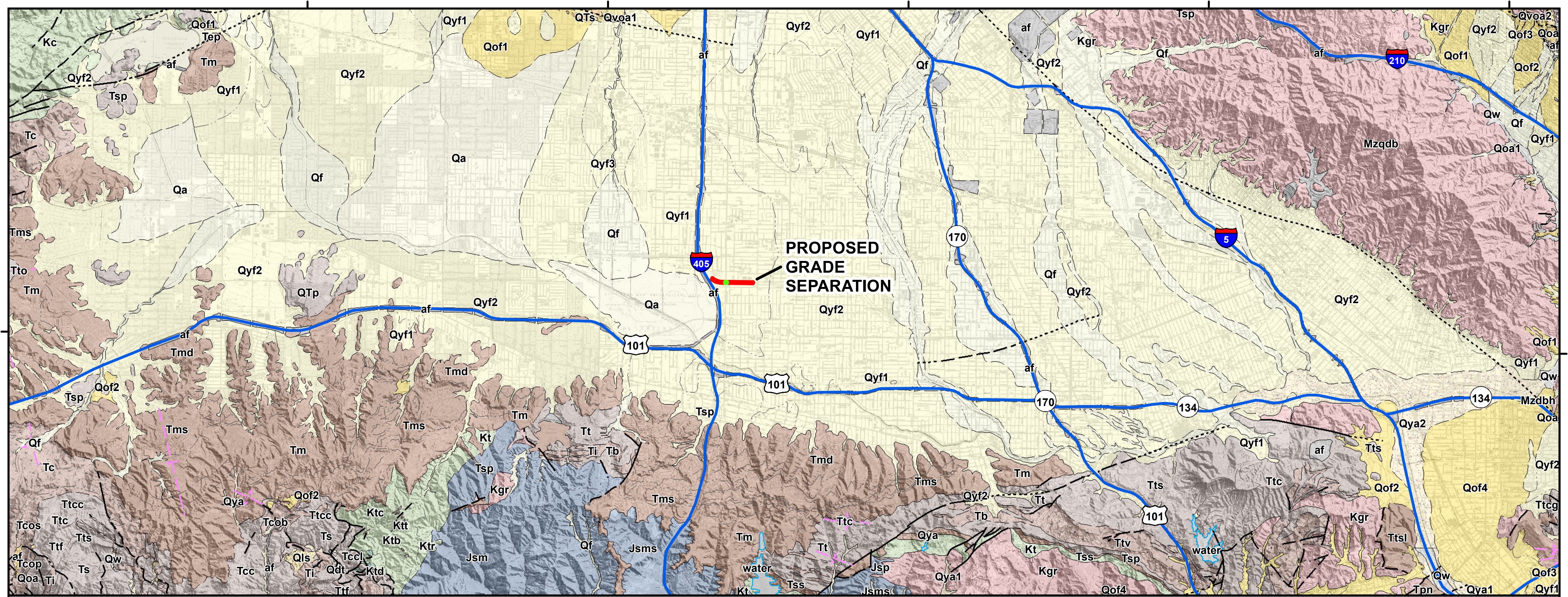
| | |
|---|---|
| LAT:<br>LON: | 34.1803<br>-118.4663 |
| SCALE: | 1:24,000 |
| DRAWN: | KSH |
| CHECK: | PR |
| DATE: | 8/21/2020 |

SITE VICINITY MAP

FIGURE:
1

PROJECT:
4953-18-0121

G:\4953 Geotech\2018\180121 Metro Orange Line\GIS\4953180121 Figure 1 Site Vicinity Map rev03.mxd



PROPOSED GRADE SEPARATION

## Geologic Units

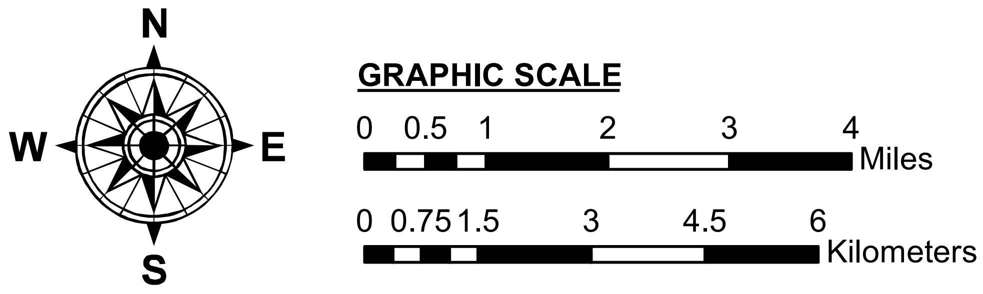
af - Artificial fill (latest Holocene)
pa - Ponded alluvium, fanglomerate and lacustrine deposits (latest Holocene)
Qa - Alluvium, undifferentiated, active channel (late Holocene)
Qw - Wash deposits (late Holocene)
Qf - Alluvial fan deposits (late Holocene, Holocene)
Qyf3,Qyf2, Qyf1 - Young alluvial fan deposits (Holocene to late Pleistocene)
Qyf - Young alluvial fan deposits, undivided (Holocene to late Pleistocene)
Qls - Landslide deposits (Holocene, late Pleistocene)
Qya - Young alluvium, undivided (Holocene to late Pleistocene)
Qya2 - Young alluvium, unit 2 (late Pleistocene)
Qya1 - Young alluvium, unit 1 (late Pleistocene)
Qof4, Qof3 - Old alluvial fan deposits, unit 4 (late Pleistocene)
Qof2 - Old alluvial fan deposits, unit 2 (late Pleistocene)
Qof1 - Old alluvial fan deposits, unit 1 (middle Pleistocene)
Qoa - Old alluvium, undivided (late to middle Pleistocene)
Qoa1 - Old alluvium, unit 1 (middle Pleistocene)
Qvoa2 - Very old alluvium, unit 2 (early Pleistocene)
Qvoa1 - Very old alluvium, unit 1 (early Pleistocene)
QTs - Saugus Formation, undivided (early Pleistocene, late Pliocene)
QTp - Pico Formation, undivided (Pliocene)
Tto - Towsley Formation, sandstone/claystone (late Miocene and early Pliocene)
Tpn - Puente FM, undiv., siltstone, sandstone, shale (early Pliocene/late Miocene)
Tm - Modelo Formation, undivided, mudstone, siltstone, shale (late Miocene)
Tms - Modelo Formation, siltstone, shale, clay shale (late Miocene)
Tmd - Modelo Formation, diatomaceous shale (late Miocene)
Tpss - Puente Formation, sandstone (late Miocene)
Ti - Intrusive rocks, undivided (middle Miocene)
Tc - Conejo Volcanics, undifferentiated (middle Miocene)
Tcop - Conejo Volcanics, basaltic lower zone, pillow basalt (middle Miocene)
Tcob - Conejo Volcanics, basaltic lower, basalt/andesitic basalt (middle Miocene)
Tt - Topanga Group, undivided, sedimentary and volcanic rocks (middle Miocene)
Ttsl - Topanga Canyon Formation, siltstone, sandstone and siliceous shale (middle Miocene)
Ttcg - Topanga Group, conglomerate (middle Miocene)
Tts - Topanga Canyon Formation, Saddle Peak Member, sandstone and conglomerate (middle and early Miocene)
Ttv - Topanga Canyon Formation, interbedded andesite and basalt flows (middle and early Miocene)
Ttcc - Topanga Canyon Formation, Cold Creek Member, sandstone, siltstone (early middle Miocene)
Ttf - Topanga Canyon FM, Fernwood Member, paralic-fluvial, estuarine, marine sandstone (early middle Miocene)
Ttc - Topanga Canyon Formation, undivided, sandstone with interbedded siltstone (early middle Miocene)
Tb - Basalt dikes, flows and breccias (Miocene)
Tsp - Sespe Formation, Piuma Member, sandstone (early Miocene to late Eocene)
Ts - Sespe Formation, undivided, conglomerate, sandstone (late Eocene, Oligocene, early Miocene)
Tccl - Coal Canyon Formation, algal limestone (Eocene and Paleocene)
Tcc - Coal Canyon Formation, sandstone, conglomerate, siltstone (Eocene and Paleocene)
Tep - Sedimentary Rocks of Chatsworth Reservoir (Eocene and/or Paleocene)
Tcos - Conejo Volcanics, Solstice Canyon tongue, basaltic and andesitic flow breccia, tuff (middle Miocene)
Tss - Santa Susana Formation, clay and mudrock (early to late Paleocene)
Kc - Chatsworth Formation, sandstone (late Cretaceous)
Ktc - Tuna Canyon Formation, pebble conglomerate (late Cretaceous)
Ktd - Tuna Canyon FM, fine-grained fossiliferous sandstone (late Cretaceous)
Ktb - Tuna Canyon Formation, sandstone (late Cretaceous)
Ktr - Trabuco Formation, conglomerate (late Cretaceous)
Kt - Tuna Canyon FM, marine sandstone/siltstone/conglomerate (late Cretaceous)
Ktt - Tuna Canyon Formation, marine sandstone (late Cretaceous)
Kgr - Granitic rocks (late Cretaceous)
Mzhd - Granitic rocks (late Cretaceous)
Jsm - Santa Monica Slate (late Jurassic)
Jsp - Santa Monica Slate, phyllite (late Jurassic)
Jsms - Santa Monica Slate, spotted (late Jurassic)
Mzg - Granitic complex (Mesozoic)
Mzqdb - Biotite-quartz diorite (Mesozoic)
Mzdbh - Biotite-hornblende diorite (Mesozoic)

## Geologic Contacts

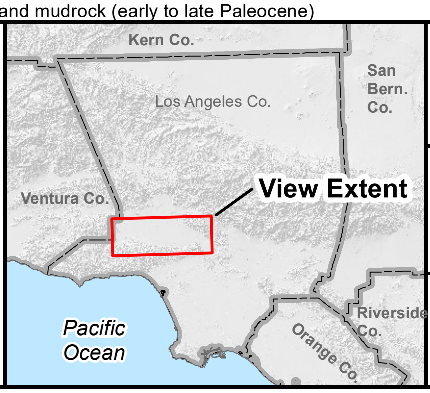
——— contact, identity and existence certain, location accurate
—— — contact, identity and existence certain, location approximate
········ contact, identity and existence certain, location concealed
— — — contact, identity and existence certain, location inferred

——— fault, identity and existence certain, location accurate
—— — fault, identity and existence certain, location approximate
········ fault, identity and existence certain, location concealed
— — — fault, identity and existence certain, location inferred

(Queried where contacts are questionable)



**GRAPHIC SCALE**



View Extent

References:
Bedrossian, T.L., Roffers, P., Hayhurst, C.A., 2012, "Geologic Compilation of Quaternary Surficial Deposits in Southern California", California Geological Survey, vector spatial data, Special Report 217, December 2012.

wood.

Wood
Environment & Infrastructure
Solutions, Inc.
6001 Rickenbacker Road
Los Angeles, California 90040
T: 323.889.5300 F: 323.721.6700

Proposed Sepulveda Grade Separation
Metro Orange Line Improvements
Los Angeles, California

LAT: 34.1803
LON: -118.4663
SCALE: 1:100,000
DRAWN: KSH
CHECK: RM
DATE: 8/21/2020

# REGIONAL GEOLOGIC MAP

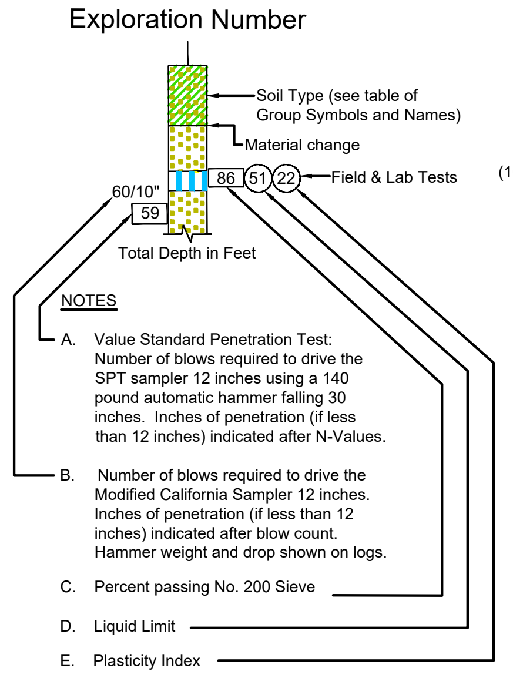
FIGURE: 2
PROJECT: 4953-18-0121

Path: G:\4953_Geotech\2018\180121 Metro Orange Line\GIS\4953180121_Figure_2_Regional_Geologic_Map_rev03.mxd

## EXPLANATION

| | | |
|---|---|---|
| **G-1** | ● | Geotech Boring |
| **CPT-4** | ▲ | Cone Penetration Test |
| **A-721566** | ◐ | Prior Investigation (LeRoy Crandall and Associates)) |
| **B-50** | ◕ | Prior Investigation (Diaz-Yourman) |
| **LPE-10** | ⊕ | Prior Investigation (Earth Technologies Corporation) |
| **3732A** | ◉ | LACDPW Groundwater Monitoring Well |

Exploration Number



NOTES

A. Value Standard Penetration Test: Number of blows required to drive the SPT sampler 12 inches using a 140 pound automatic hammer falling 30 inches. Inches of penetration (if less than 12 inches) indicated after N-Values.

B. Number of blows required to drive the Modified California Sampler 12 inches. Inches of penetration (if less than 12 inches) indicated after blow count. Hammer weight and drop shown on logs.

C. Percent passing No. 200 Sieve

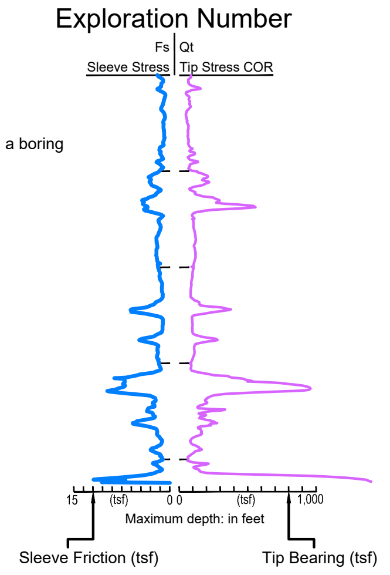
D. Liquid Limit

E. Plasticity Index

ROTARY, BUCKET & HOLLOW STEM BORING

▼ Overnight groundwater depth measured in a boring
(10/11/18)

Exploration Number



CONE PENETRATION TEST (CPT) SOUNDING
(S): Shear Wave Velocity Survey

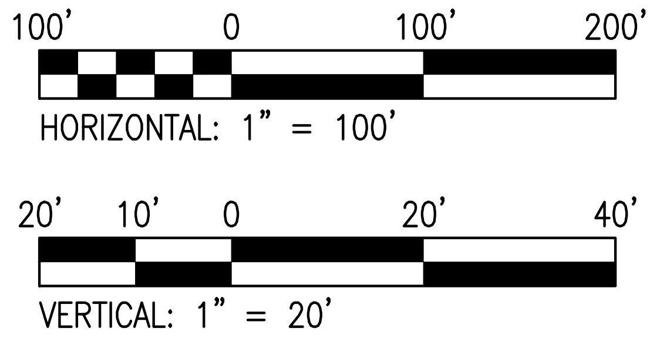
ft bgs: depth of boring in feet below ground surface elevation at time of drilling

GROUP SYMBOLS AND NAMES

| Graphic/Symbol | | Group Names |
|---|---|---|
| ▨ | FILL | CLAYEY Artificial FILL |
| ▨ | | SILTY SAND or CLAYEY SAND Artificial FILL |
| ▨ | | SANDY Artificial FILL |
| ▨ | CL | Lean CLAY |
| ▨ | | SANDY lean CLAY |
| ▨ | | Lean CLAY with GRAVEL |
| ▨ | CL-ML | SILTY CLAY |
| ▨ | | SILTY CLAY with GRAVEL |
| ▨ | CL-CH | Lean to fat CLAY |
| ▨ | | Lean to fat CLAY with GRAVEL |
| ▨ | CH | Fat CLAY |
| ▨ | | Fat CLAY with SAND |
| ▨ | | Fat CLAY with GRAVEL |
| ▨ | ML | SILT |
| ▨ | | SILT with SAND |
| ▨ | | SANDY SILT |
| ▨ | MH | Elastic SILT |
| ▨ | | Elastic SILT with GRAVEL |

GROUP SYMBOLS AND NAMES

| Graphic/Symbol | | Group Names |
|---|---|---|
| ▨ | SM | SILTY SAND |
| ▨ | | SILTY SAND with GRAVEL |
| ▨ | SP-SM | Poorly graded SAND with SILT |
| ▨ | | Poorly graded SAND with SILT and GRAVEL |
| ▨ | SC-SM | SILTY, CLAYEY SAND |
| ▨ | | SILTY, CLAYEY SAND with GRAVEL |
| ▨ | SC | CLAYEY SAND |
| ▨ | | CLAYEY SAND with GRAVEL |
| ▨ | SP | Poorly graded SAND |
| ▨ | | Poorly graded SAND with GRAVEL |
| ▨ | SW | Well-graded SAND |
| ▨ | | Well-graded SAND with GRAVEL |



PRELIMINARY - NOT FOR CONSTRUCTION

| REV | DATE | BY | APP | REG NO | EXPIRES | SEAL HOLDER | DESCRIPTION |
|---|---|---|---|---|---|---|---|
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |

DESIGNED BY
PER
DRAWN BY
VMN
CHECKED BY
JF
IN CHARGE
HP / PM
DATE
08/20/2020

FOR INFORMATION ONLY NOT FOR CONSTRUCTION

Metro

**LOS ANGELES COUNTY**
**METROPOLITAN TRANSPORTATION AUTHORITY**

**MOTT MACDONALD**
1000 Wilshire Blvd, Suite 400
Los Angeles, CA 90017
Tel: 818-506-8088

wood.

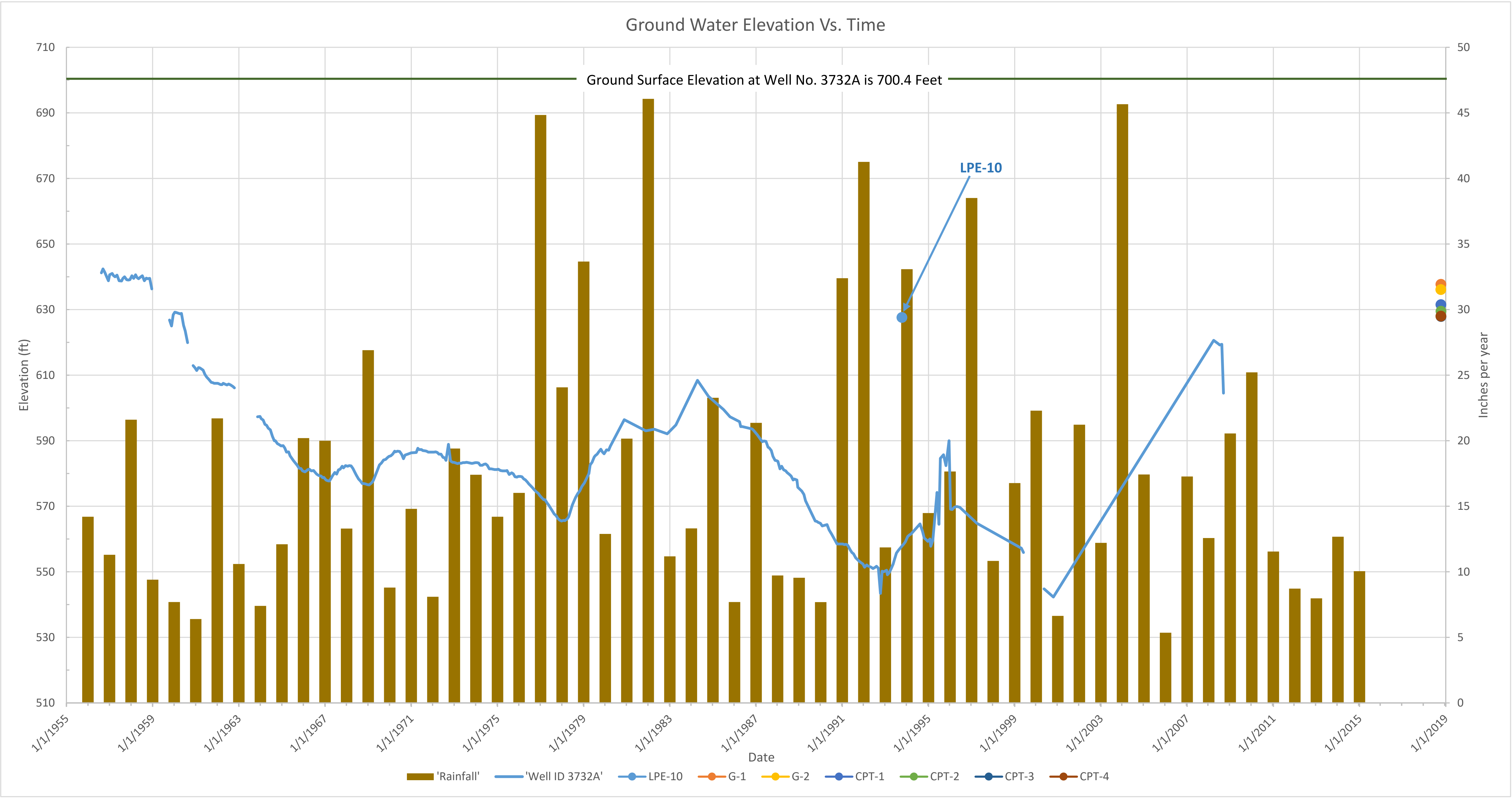
PRELIMINARY - NOT FOR CONSTRUCTION

FOR INFORMATION ONLY
NOT FOR CONSTRUCTION

METRO ORANGE LINE
SEPULVEDA GRADE SEPARATION
EXPLORATION PLAN
AND PROFILE

CONTRACT NO
DRAWING NO
REV
SCALE
1"=100'
FIGURE NO
3

G:\4953_Geotech\2018\180121 Metro Orange Line\CAD\DWG\4953-18-0121_Fig-3_Plot-Plan(20.08.19).dwg
Tuesday, September 01, 2020 12:13:53 PM

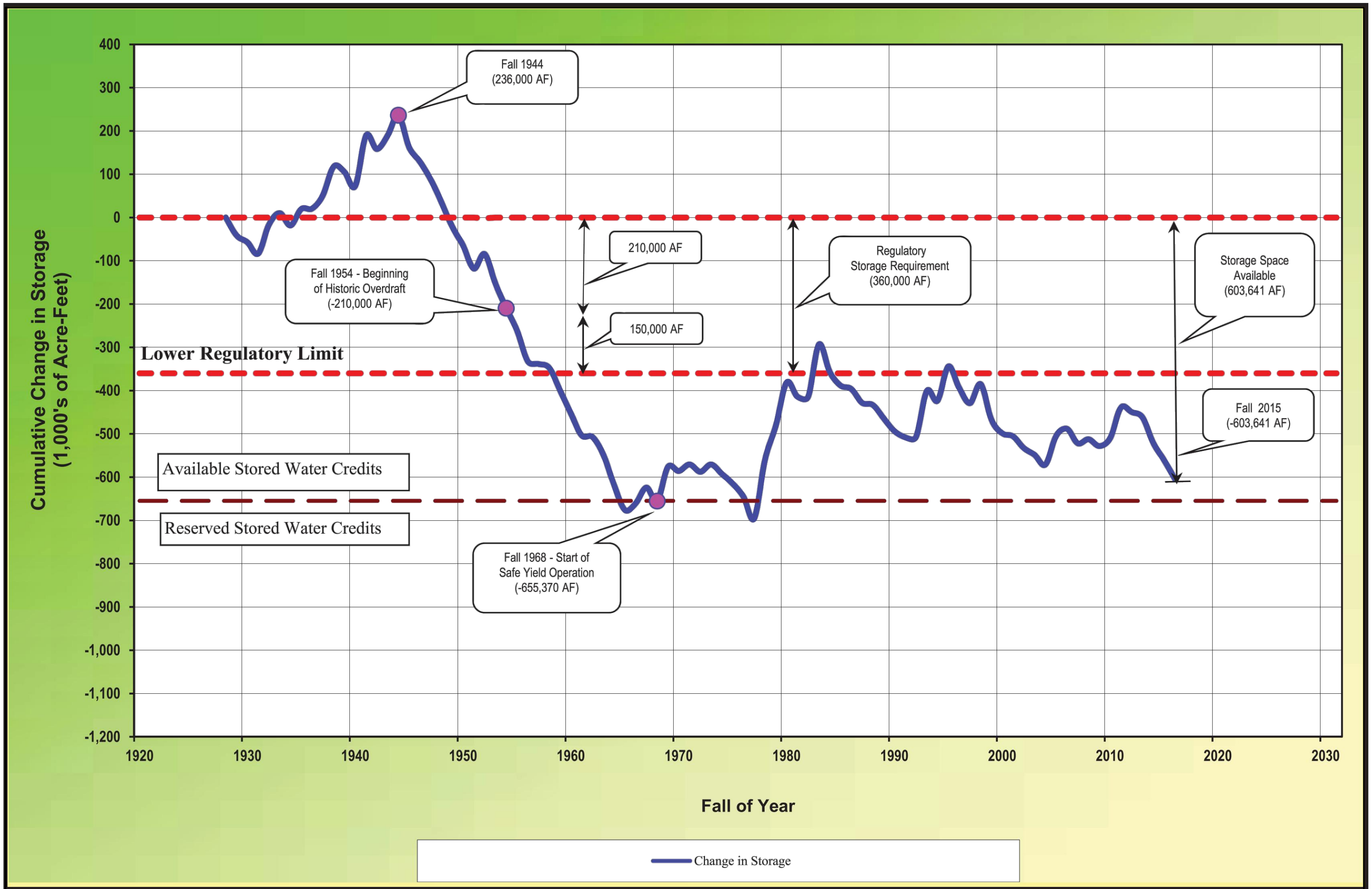


RAINFALL AT BURBANK VALLEY PUMP PLANT RAINGAGE
WELL, BORING AND CPT LOCATIONS SHOWN ON FIGURE 3

By: GA 8/18/2020
Checked By: RM 8/18/2020

**Metro Orange Line Improvements**
Sepulveda Station and Grade Separation
Historic Rainfall and Groundwater Elevation
4953-18-0121
Figure 4

Path: G:\4953_Geotech\2018\180121 Metro Orange Line\CAD\DWG\4953-18-0121_Fig-5_Cumulation-Groundwater.dwg [A-8.5x11 (L)]
Date: August 24, 2020 - 8:17am By: vo.nguyen



**2015-16 Water Year**

**ULARA Watermaster**

**Report**

## San Fernando Basin:
## Cumulative Change in Groundwater Storage

**PLATE**

**7**

Reference:

URLA Watermaster, 2017, 2015-2016 Annual Report, Watermaster Service in the Upper Los Angeles River Area (ULARA), Los Angeles County, California.

**Wood**
Environment & Infrastructure Solutions, Inc.,
6001 Rickenbacker Rd, Los Angeles, CA 90040
Phone (323) 889-5300 Fax (323) 721-6700

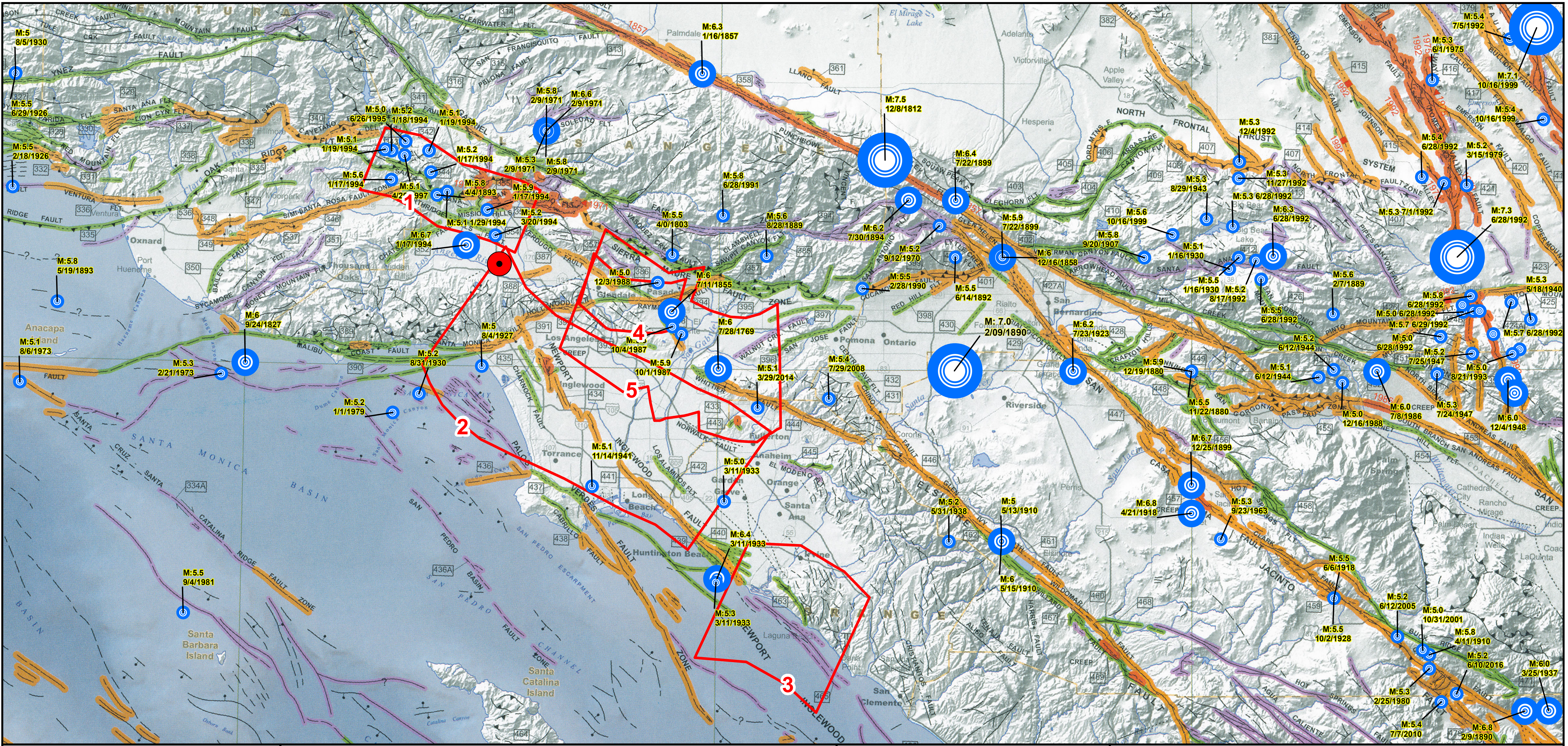
Metro Orange Line
Sepulveda Grade Separation

| | |
|---|---|
| LT,LNG: | |
| PREPARED BY: | VMN |
| SCALE: | NTS |
| BY: | RM |
| CHKD: | RM |
| DATE: | 08/24/2020 |

Cumulative Change in Groundwater Storage, San Fernando Basin

FIGURE NO.
5

PROJECT NO.
4953-18-0121



**Earthquakes**

Approximate Epicentral Area of Earthquake

Events ≥ 7.0

Events 6.0 - 6.9

Events 5.0 - 5.9

**Faults**

🟥 Historic Fault Displacement

🟧 Holocene Fault Displacement

🟩 Evidence of Late Quaternary Fault Displacement

🟪 Undifferentiated Quaternary Faults

Bar and ball on downthrown side (relative or apparent)

Arrows along fault indicate relative or apparent direction of lateral movement

Arrows on fault indicates direction of dip

Low angle fault with barbs on upper plate. Fault surface generally dips less than 45 but locally may have been subsequently steepened.

Blind Thrust Faults (surface projection)

Blind Thrust Index:

1 Northridge Thrust

2 Compton Thrust

3 San Joaquin Hills Thrust

4 Upper Elysian Park Thrust

5 Puente Hills Thrust

● SITE

N
W E
S

0 4 8 16 24 32 Kilometers

0 3 6 12 18 24 Miles

REFERENCES:
Jennings, C.W. and Bryant, W.A., 2010,"Fault Activity Map of California," California Geological Survey, GDM-006, May 2010
Earthquake Catalogs: California Geological Survey, 1769-1932; Southern California Earthquake Center, 1932-2017.
Working Group on California Earthquake Probabilities (WGCEP), 2016, Fault Database Tools, <http://www.wgcep.org/tools-fault_db>

wood.

Proposed Sepulveda Grade Separation
Metro Orange Line
Los Angeles, California

| | |
|---|---|
| LAT: | 34.1803 |
| LON: | -118.4663 |
| SCALE: | 1:750,000 |
| DRAWN: | KSH |
| CHECK: | x |
| DATE: | 11/29/2018 |

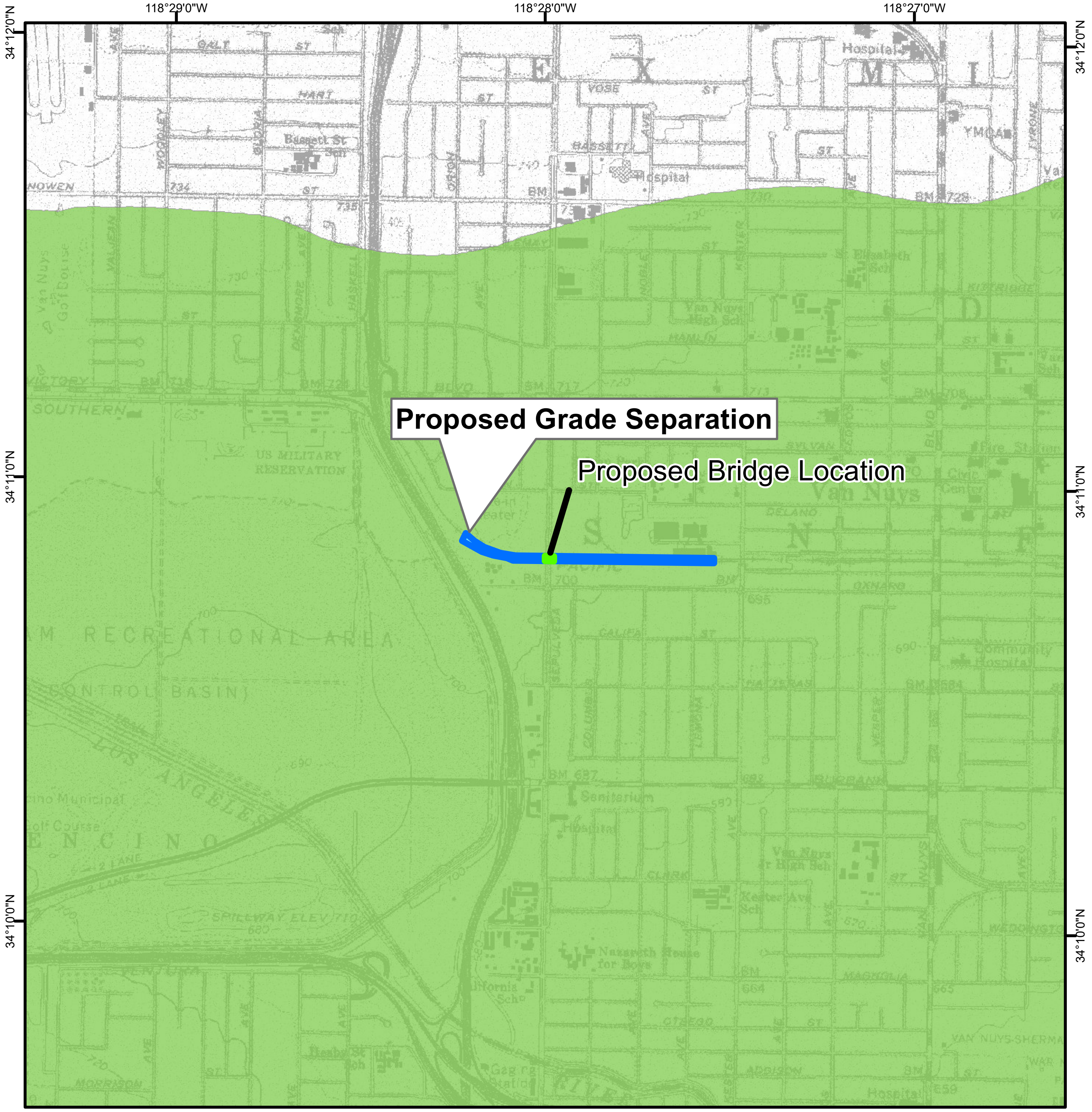
Wood
Environment & Infrastructure Solutions, Inc.
6001 Rickenbacker Road
Los Angeles, California 90040
Tel: 323.889.5300
Fax: 323.721.6700

REGIONAL FAULT AND SEISMICITY MAP

FIGURE:
**6**

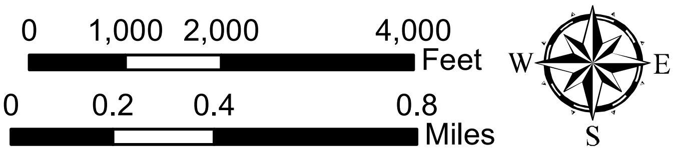
PROJECT:
4953-18-0121

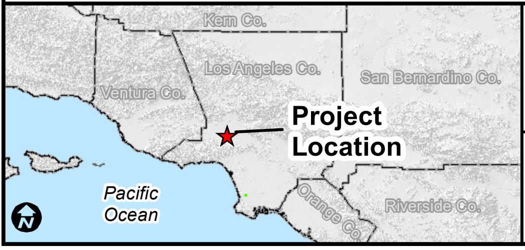
Path: G:\4953_Geotech\2018\180121 Metro Orange Line\GIS\4953180861_Figure_5_Faults_Seismicity_Map.mxd



Base: Los Angeles County Topographic Map
CGS, 2002, "GIS Files of Official Alquist Priolo Earthquake Fault Zones, Southern Region," May 31, 2002, CGS CD 2001-05.

🟩 Liquefaction Zone
Areas where historic occurrence of liquefaction, or local geological, geotechnical and ground water conditions indicate a potential for permanent ground displacements such that mitigation as defined in Public Resources Code Section 2693(c) would be required.





wood.

Wood
Environment & Infrastructure Solutions, Inc.
6001 Rickenbacker Road
Los Angeles, California 90040
Tel: 323.889.5300
Fax: 323.721.6700

Proposed Sepulveda Grade Separation
Metro Orange Line Improvements
Los Angeles, California

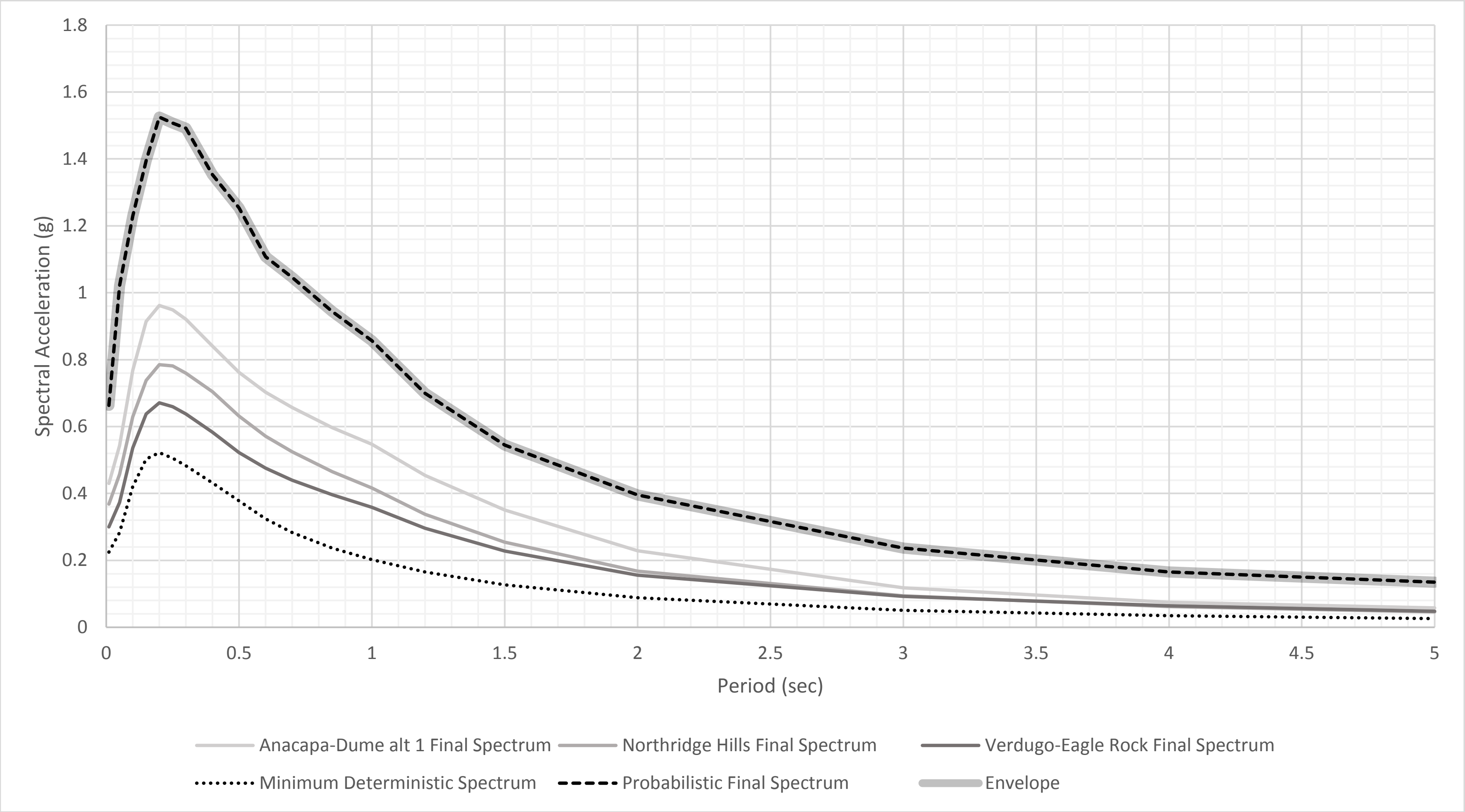
LAT: 34.1803
LON: -118.4663
SCALE: 1:24,000
DRAWN: KSH
CHECK: RM
DATE: 8/21/2020

## LIQUEFACTION HAZARD MAP

FIGURE: 4

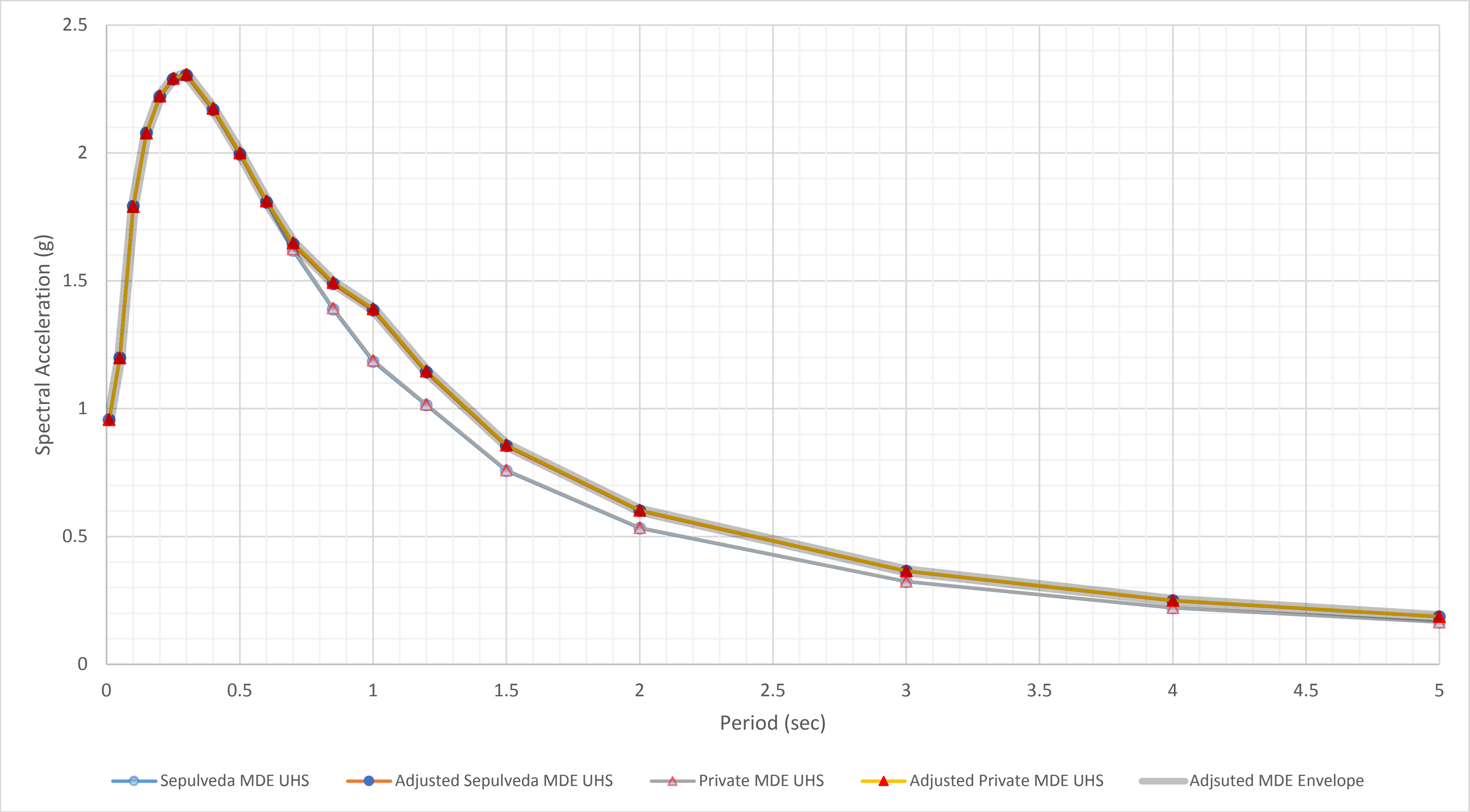
PROJECT: 4953-18-0121

G:\4953 Geotech\2018\180121 Metro Orange Line\GIS\4953180121 Figure 7 Liquefaction Hazard Map.mxd



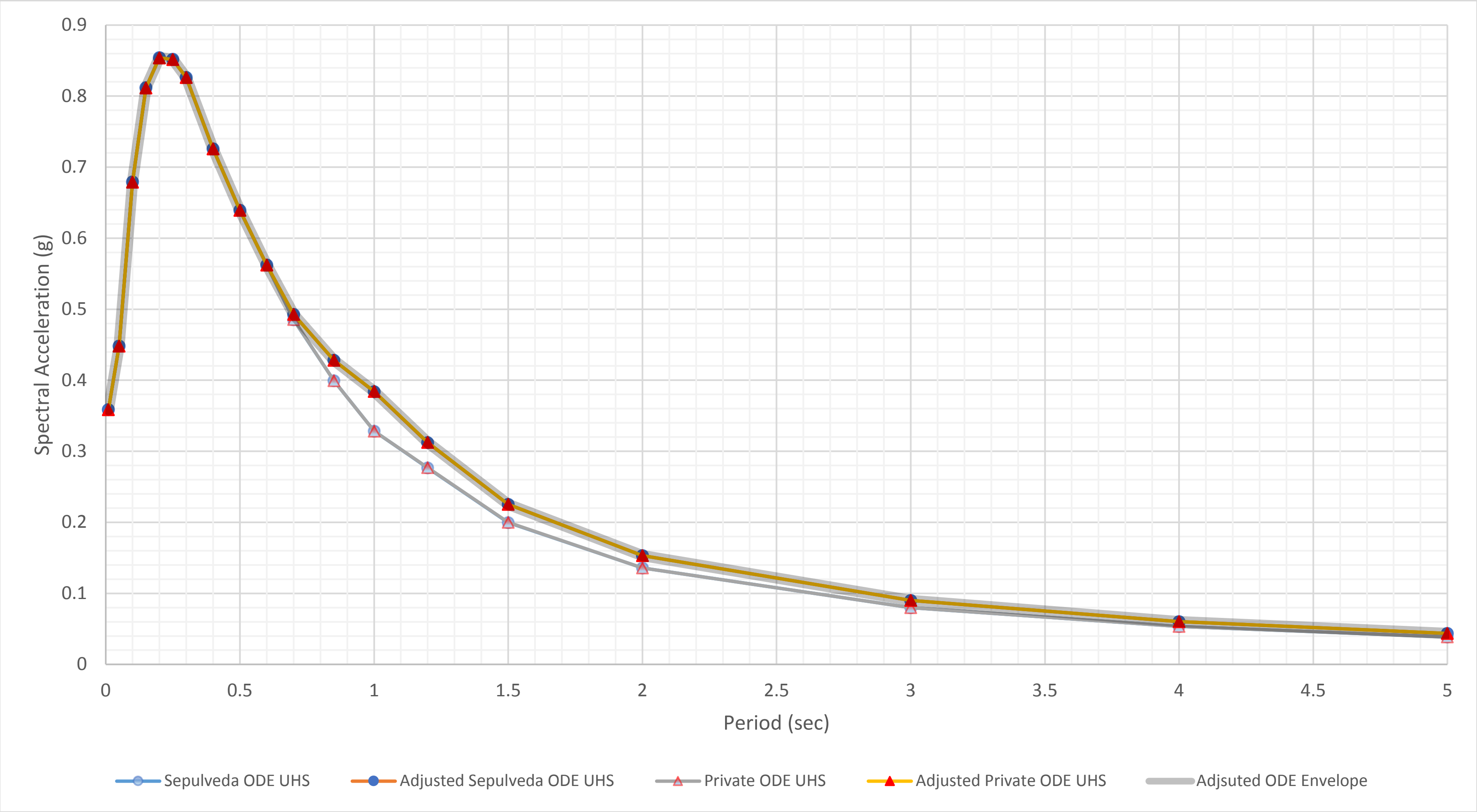
By: KSH 11/29/2018

| | | |
|---|---|---|
| Metro Orange Line Sepulveda Grade Separation<br>4953-18-0121 | wood. | Caltrans ARS Response Spectra<br>975-year Return Period<br>Envelope<br>Figure y |



By: KSH 11/29/2018

| | | |
|---|---|---|
| Metro Orange Line Sepulveda Grade Separation<br>4953-18-0121 | wood. | Adjusted Probabilistic Uniform Hazard Response Spectra<br>2475-year Return Period<br>Maximum Design Earthquake (MDE)<br>Figure ф |

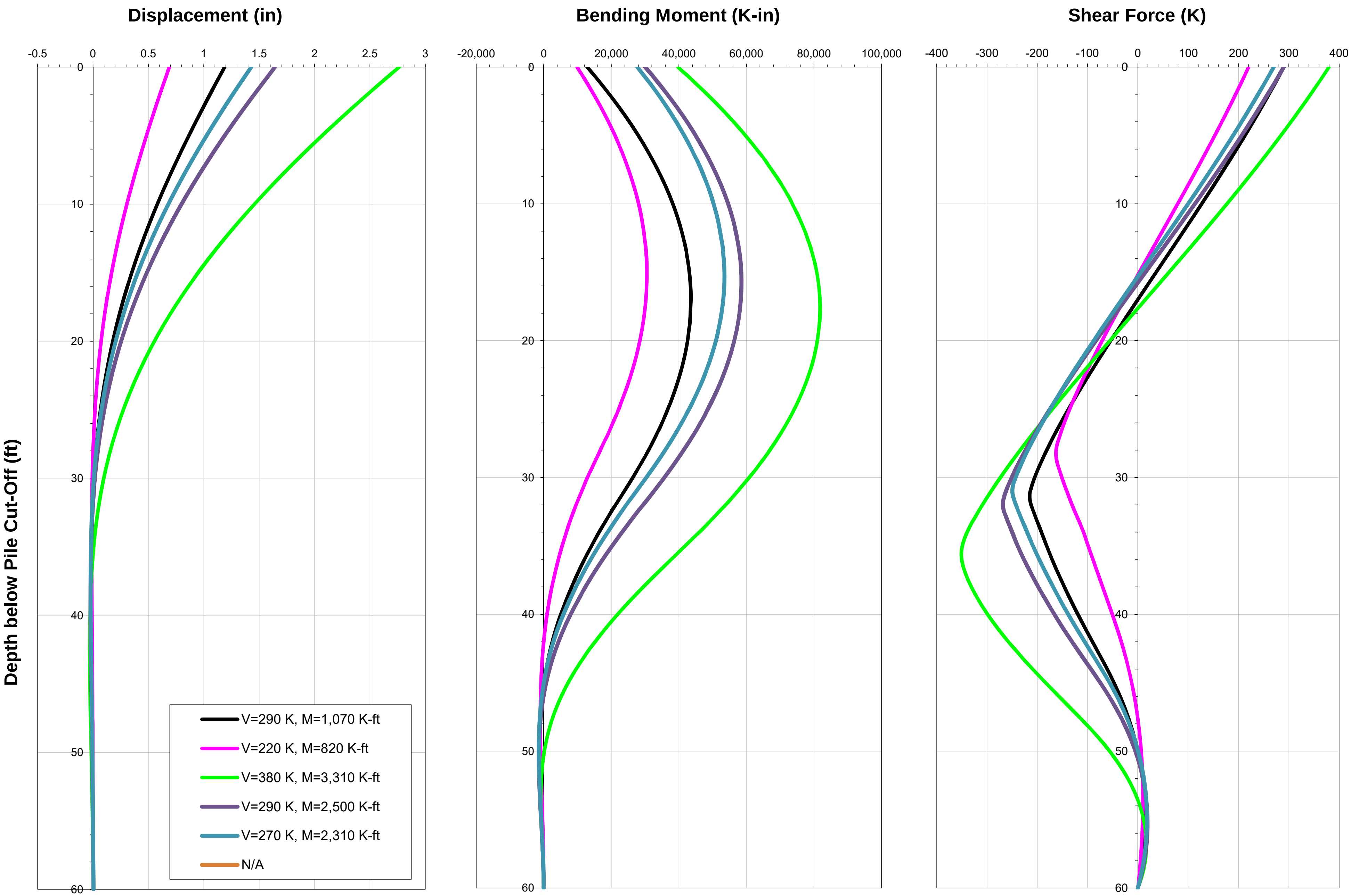


By: KSH 11/29/2018

Metro Orange Line Sepulveda Grade Separation
4953-18-0121

wood.

Adjusted Probabilistic Uniform Hazard Response Spectra
150-year Return Period
Operating Design Earthquake (ODE)
Figure мл



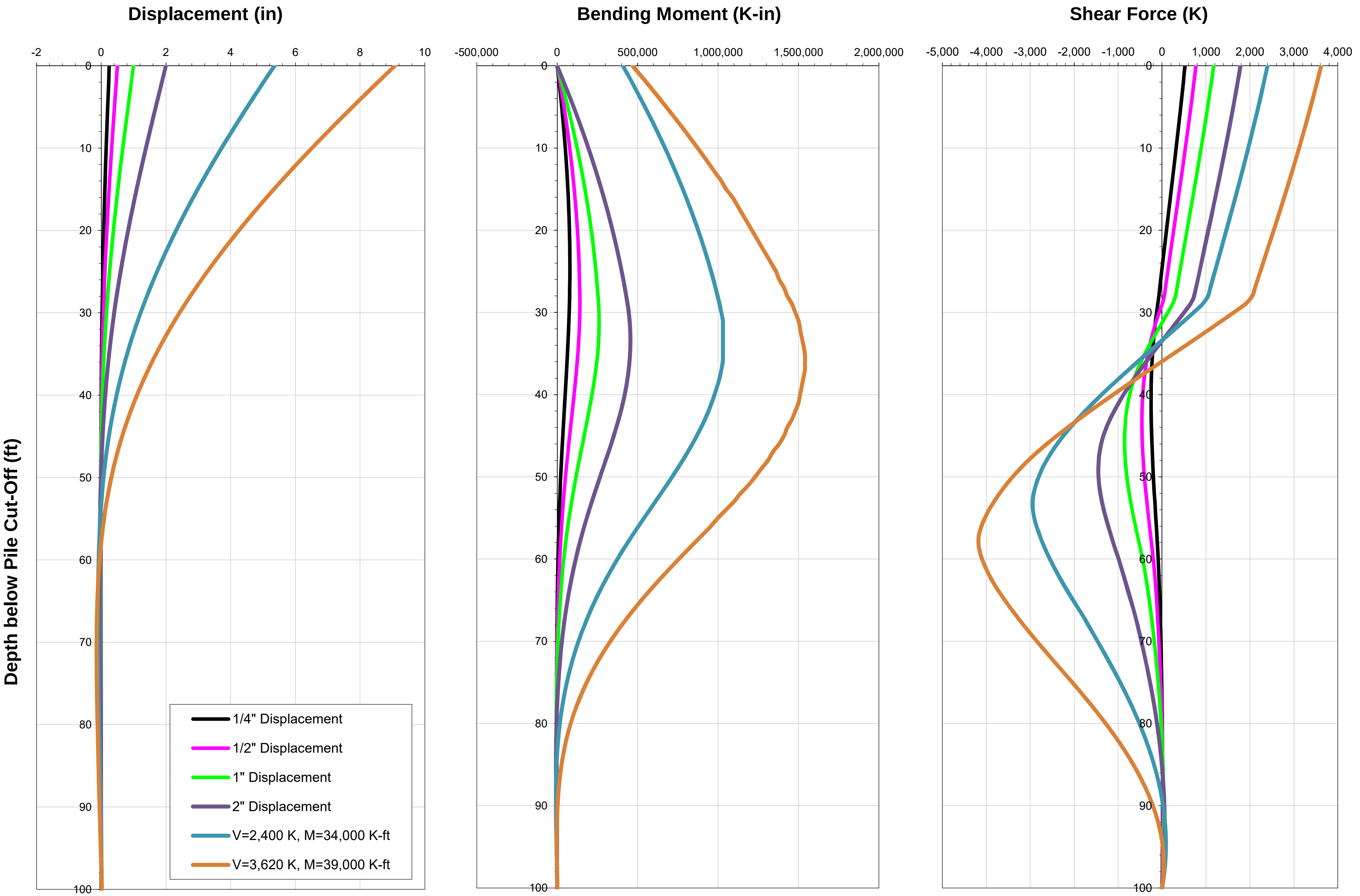
**Earth Mechanics, Inc.**
Geotechnical and Earthquake Engineering

**Proposed Sepulveda Blvd Grade Separation**
**Metro Orange Line ImprovementsSeparation**

**Date: 9/10/20**

**LATERAL PILE SOLUTIONS FOR ABUTMENTS**
**SEPULVEDA STATION**
**(60" Dia. CIDH Pile)**

Figure 11



**Earth Mechanics, Inc.**

Geotechnical and Earthquake Engineering

**Proposed Sepulveda Blvd Grade Separation**
**Metro Orange Line ImprovementsSeparation**

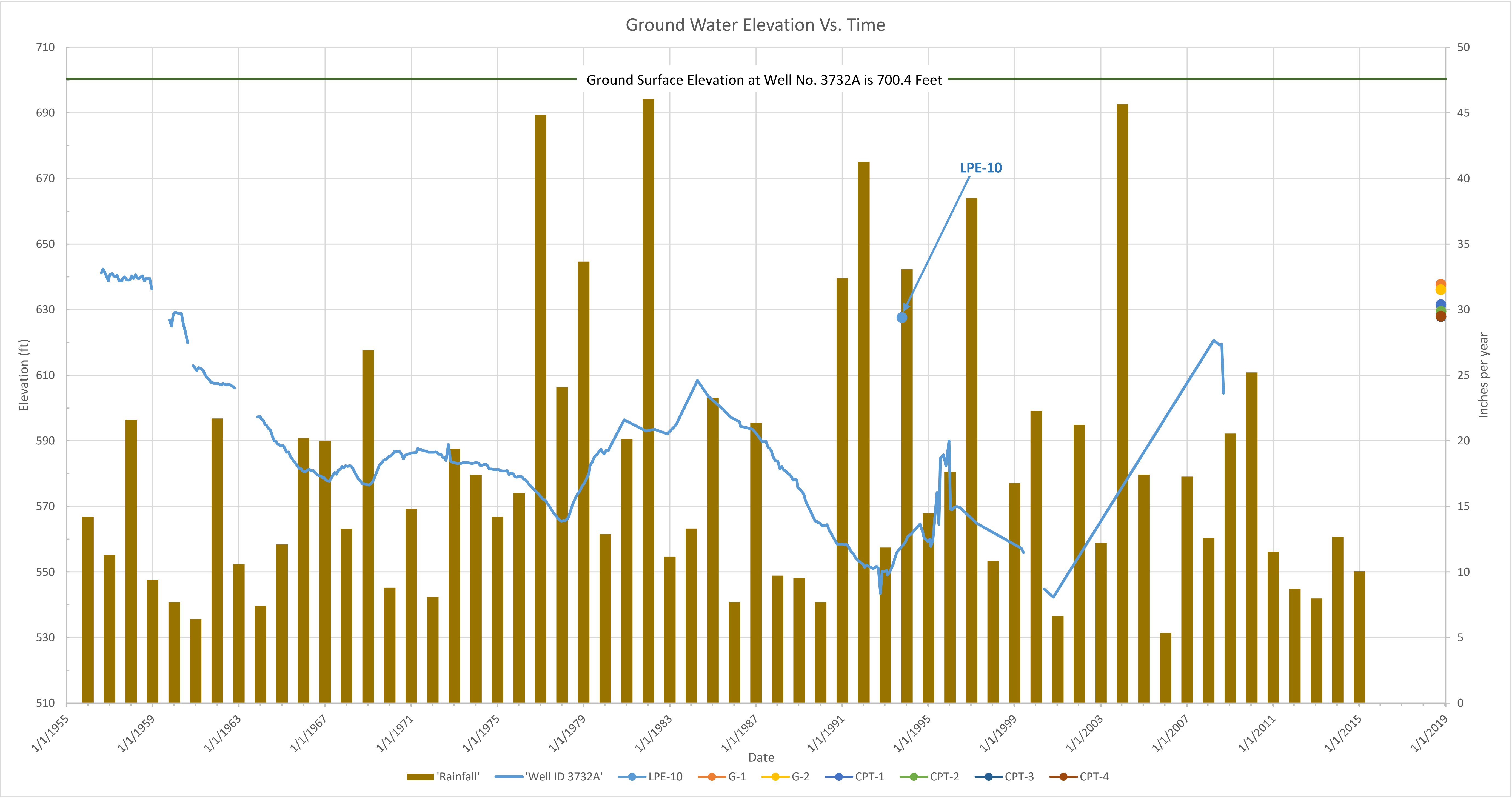
**Date: 9/10/20**

**LATERAL PILE SOLUTIONS FOR BENTS**
**SEPULVEDA STATION**
**(120" Dia. CIDH Pile)** Figure 12

mottmac.com

# APPENDIX G

## Reviewed Boring Log and Groundwater Monitoring Data for Groundwater Depth Assessment



RAINFALL AT BURBANK VALLEY PUMP PLANT RAINGAGE
WELL, BORING AND CPT LOCATIONS SHOWN ON FIGURE 3

By: GA 8/18/2020
Checked By: RM 8/18/2020

**Metro Orange Line Improvements**
Sepulveda Station and Grade Separation
Historic Rainfall and Groundwater Elevation
4953-18-0121
Figure 4

wood.

Geosyntec consultants
16644 West Bernardo Dr., Suite 301
San Diego, CA 92127
Tel: (858) 674-6559
Fax: (858) 674-6586

GS FORM:
BORE 1/99

# BOREHOLE RECORD

**BORING** B-1 **SHEET** 1 **OF** 2
**START DATE** 2/10/20 **ELEVATION** FT MSL
**FINISH DATE** 2/10/20
**PROJECT** LA Green Streets
**LOCATION** 12607 Victory Blvd. North Hollywood, CA
**PROJECT NUMBER** LA0565

| DEPTH (ft) | MATERIAL DESCRIPTION | SYMBOLIC LOG | ELEVATION (ft) | SAMPLES NUMBER | SAMPLES TYPE | SAMPLES BLOW COUNTS | SAMPLES N VALUE | SAMPLES % RECOVERY | TIME | COMMENTS |
|---|---|---|---|---|---|---|---|---|---|---|
|  | Asphalt Street, No Base. |  |  |  | BULK |  |  |  |  | Hand<br>Auger<br>0-5"<br>Bulk<br>Sample<br>0-5" |
|  | <u>Quaternary Young Alluvial Fan Deposits:</u> Loose, slightly moist to moist, medium brown to brown, poorly graded, fine grained SAND with silt. (SP-SM) | SP-SM |  |  |  |  |  |  |  |  |
| 5 | Dry to slightly moist, light brown, localized gravel. |  |  | 1 | SPT | 3<br>4<br>4 |  |  |  | PID<br>0.0 |
| 10 | Loose to medium dense, slightly moist, light to medium brown. |  |  | 2 | SPT | 4<br>6<br>8 |  |  |  | PID<br>0.0<br>@12'<br>drill<br>rig<br>chatter |
| 15 | Loose, slightly moist to moist, medium brown to brown, fine grained, silty SAND. (SM) | SM |  | 3 | SPT | 2<br>2<br>2 |  |  |  | PID<br>0.0 |
| 20 | Medium dense to dense, dry to slightly moist, light brown to medium brown, poorly graded, fine grained SAND with localized gravel. (SP) | SP |  | 4 | SPT | 4<br>10<br>12 |  |  |  | PID<br>0.1<br>@19'<br>drill<br>chatter |
| 25 | Medium stiff, medium gray brown, sandy SILT, fine grained sand, slight plasticity. (ML) | ML |  | 5 | SPT | 2<br>3<br>2 |  |  |  | PID<br>0.1 |
| 30 |  |  |  |  |  |  |  |  |  |  |

**CONTRACTOR** Martini Drilling
**EQUIPMENT** CME 75 8"
**DRILL MTHD** Hollow Stem
**DIAMETER** 8"
**LOGGER** DA **REVIEWER** DK **PRINTED** 2/18/20

**LATITUDE**
**LONGITUDE**
**ANGLE** Vertical
**BEARING** ------

**REMARKS:** Screen for infiltration installed 40'-50'

**COORDINATE SYSTEM:**

**SEE KEY SHEET FOR SYMBOLS AND ABBREVIATIONS**

**Geosyntec consultants**

16644 West Bernardo Dr., Suite 301
San Diego, CA 92127
Tel: (858) 674-6559
Fax: (858) 674-6586

GS FORM:
BORE 1/99

# BOREHOLE RECORD

**BORING** B-1 **SHEET** 2 **OF** 2
**START DATE** **ELEVATION** **FT MSL**
**FINISH DATE**
**PROJECT** LA Green Streets
**LOCATION** 12607 Victory Blvd. North Hollywood, CA
**PROJECT NUMBER** LA0565

| DEPTH (ft) | MATERIAL DESCRIPTION | SYMBOLIC LOG | ELEVATION (ft) | SAMPLES | | | | | TIME | COMMENTS |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | NUMBER | TYPE | BLOW COUNTS | N VALUE | % RECOVERY | | |
| | | | | 6 | SPT | 3<br>6<br>8 | | | | PID<br>0.1<br>Majority<br>of<br>sample<br>previous<br>material<br>(ML) |
| | Medium dense, moist, brown to gray brown, poorly graded silty SAND. (SP) | SP | | | | | | | | |
| 35 | Dense to very dense, slightly moist, medium brown, well graded gravelly SAND, elevated blow counts potentially due to gravel. (SW) | SW | | 7 | SPT | 14<br>50<br>for 5" | | | | PID<br>0.1<br>~35'-40'<br>drill<br>chatter |
| 40 | Gravel up to 1.5" in diameter.<br>Dense to very dense, slightly moist, medium brown, poorly graded SAND with silt and gravel. | SP-SM | | 8 | SPT | 10<br>16<br>24 | | | | PID<br>0.2<br>42'<br>drill<br>chatter |
| 45 | Gravels subangular, gravel size up to 1.25". | | | 9 | SPT | 10<br>17<br>32 | | | | PID<br>0.1 |
| 50 | Very dense, moist, medium brown to brown, well graded SAND with gravel, gravel decreases. (SW-SM) | SW-SM | | 10 | SPT | 38<br>50<br>for<br>15" | | | | PID<br>0.2 |
| | Total Depth 51.5'<br>No Groundwater. | | | | | | | | | |
| 55 | | | | | | | | | | |
| 60 | | | | | | | | | | |

**CONTRACTOR** Martini Drilling
**EQUIPMENT** CME 75 8"
**DRILL MTHD** Hollow Stem
**DIAMETER** 8"
**LOGGER** DA **REVIEWER** DK

**LATITUDE**
**LONGITUDE**
**ANGLE** Vertical
**BEARING** ------
**PRINTED** 2/18/20

**REMARKS:** Screen for infiltration installed 40'-50'

**COORDINATE SYSTEM:**

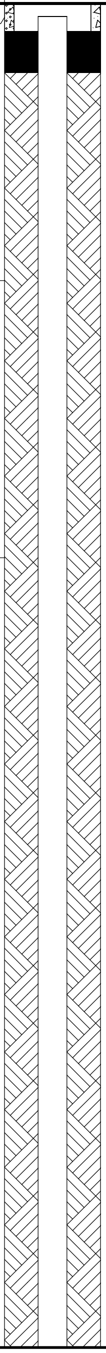
**SEE KEY SHEET FOR SYMBOLS AND ABBREVIATIONS**

Blaes Environmental
45 East Monterey Way
Phoenix, AZ 85012
Telephone: (602)728 0707
Fax: (602)728 0708

# BORING NUMBER MW11

PAGE 1 OF 2

**CLIENT** Circle K Stores Inc.
**PROJECT NAME** Circle K Store #2211173
**PROJECT NUMBER** 200-1173-01
**PROJECT LOCATION** 5560 Van Nuys Blvd., Van Nuys, CA
**DATE STARTED** 4/9/14 **COMPLETED** 4/9/14
**GROUND ELEVATION** 677.12 ft **HOLE DIAMETER** 10 inches
**DRILLING CONTRACTOR** Cascade Drilling, L.P.
**GROUND WATER LEVEL (ft. bgs):** 77.68
**DRILLING METHOD** Hollow-Stem Auger
**DATE/TIME** 4/17/2014 8:55:00 AM
**DRILL RIG MODEL** CME 85 **DRILLERS NAME** Victor Martinez
**LOGGED BY** K. Martinez
**NOTES** Top of casing = 676.28 ft. bgs
**WELL PERMIT No** 892242-426



| DEPTH (ft) | TIME | SAMPLE TYPE SAMPLE ID | BLOW COUNTS (N VALUE) | RECOVERY % | PID RESPONSE (ppm) | GRAPHIC LOG | MATERIAL DESCRIPTION | WELL DIAGRAM |
|---|---|---|---|---|---|---|---|---|
| 0 | | | | | | | 0.5 Asphalt 6" Thick 676.6 | Traffic-Rated Vault<br>Bentonite Chips (1.0' to 2.5') |
| 5 | 15:00 | | | 100 | 0.0 | | (SM) Silty Sand: fine-grained, yellowish brown (10YR 5/4), moist; trace mica | |
| 10 | 09:40 | | 6-12-16 (28) | 100 | 0.0 | | 10.0 667.1<br>(ML) Sandy Silt: dark yellowish brown (10YR 4/4), moist; trace mica; sand is fine- to medium-grained | 4" PVC SCH40 Blank Casing (0.5' to 65') |
| 15 | 09:45 | | 6-6-12 (18) | 100 | 0.0 | | (ML) Sandy Silt: dark yellowish brown (10YR 4/4), moist; trace mica; sand is fine to medium grained | |
| 20 | 09:55 | | 10-12-16 (28) | 100 | 0.0 | | 20.0 657.1<br>(SM) Silty Sand: fine-grained; yellowish brown (10YR 5/4), moist; trace mica | |
| 25 | 10:00 | | 12-13-22 (35) | 100 | 0.0 | | (SM) Silty Sand: fine-grained, light olive-brown (2.5Y 5/6); trace mica; iron oxide staining | |
| 30 | 10:05 | | 12-14-16 (30) | 100 | 0.0 | | (SM) Silty Sand: fine-grained, light olive-brown (2.5Y 5/6); trace mica; iron oxide staining | Portland Cement - Bentonite Grout (2.5' to 60') |
| 35 | 10:10 | | 18-16-18 (34) | 100 | 0.0 | | (SM) Silty Sand: fine- to coarse-grained, olive-brown (2.5Y 4/3), moist; subrounded course grains; trace mica; trace subangular gravel up to 1/4" diameter | |
| 40 | 10:20 | | 13-13-20 (33) | 100 | 0.0 | | (SM) Silty Sand: fine- to coarse-grained, olive-brown (2.5Y 4/3), moist; subrounded coarse grains; trace mica; iron oxide staining; trace subangular gravel up to 1/4" diameter | |
| 45 | 10:30 | | 12-12-16 (28) | 100 | 0.0 | | (SM) Silty Sand: fine- to medium-grained, light olive-brown (2.5Y 5/4), moist; trace mica; iron oxide staining | |

*(Continued Next Page)*

Blaes Environmental
45 East Monterey Way
Phoenix, AZ 85012
Telephone: (602)728 0707
Fax: (602)728 0708

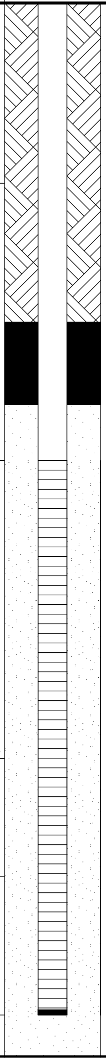
# BORING NUMBER MW11

**CLIENT** Circle K Stores Inc.

**PROJECT NAME** Circle K Store #2211173

**PROJECT NUMBER** 200-1173-01

**PROJECT LOCATION** 5560 Van Nuys Blvd., Van Nuys, CA



| DEPTH (ft) | TIME | SAMPLE TYPE SAMPLE ID | BLOW COUNTS (N VALUE) | RECOVERY % | PID RESPONSE (ppm) | MATERIAL DESCRIPTION | WELL DIAGRAM |
|---|---|---|---|---|---|---|---|
| 50 | 10:35 | | 18-12-22<br>(34) | 100 | 0.0 | (SM) Silty Sand: fine- to medium-grained, light olive-brown (2.5Y 5/4), moist; trace mica | |
| 55 | | | | | | 55.0 622.1 | |
| | 10:45 | | 16-18-22<br>(40) | 100 | 0.0 | (ML) Sandy Silt: light olive-brown (2.5Y 5/3), moist; trace mica; sand is fine grained; trace clay | |
| 60 | 10:55 | | 12-22-18<br>(40) | 100 | 0.0 | (ML) Sandy Silt: olive-brown (2.5Y 4/4), moist; trace mica; sand is fine to medium grained; trace clay | Bentonite Chips<br>(60' to 63') |
| 65 | | | | | | 65.0 612.1 | |
| | 11:00 | | 13-16-21<br>(37) | 100 | 0.0 | (SP) Sand: fine- to medium-grained, light yellowish brown (2.5Y 6/4), moist; trace silt; trace subangular gravel up to 1" diameter | |
| 70 | 11:05 | SS<br>S-70-MW11 | 10-16-22<br>(38) | 100 | 0.0 | (SP) Sand: fine- to medium-grained, light olive-brown (2.5Y 5/4), moist; trace silt; trace subangular gravel up to 1" diameter | Filter Pack Sand #3<br>(63' to 86.5') |
| 75 | 11:10 | SS<br>S-75-MW11 | 22-18-20<br>(38) | 100 | 0.0 | 75.8 601.4<br>(SP) Sand: fine- to medium-grained, light olive-brown (2.5Y 5/4), moist; trace silt; trace subangular gravel up to 1" diameter<br>(ML) Silt With Sand: light yellowish brown (2.5Y 6/3), moist to wet; sand is fine grained | |
| 80 | | | | | | 80.0 597.1 | |
| | 11:25 | | 12-18-16<br>(34) | 100 | 0.0 | (SM) Silty Sand: fine- to medium-grained, very dark grayish brown (2.5Y 3/2), wet to saturated; trace mica | 4" PVC SCH40<br>Factory-Slotted<br>Screen 0.020"<br>(65' to 85') |
| 85 | | | | | | 85.0 592.1 | Bottom Cap |
| | 11:40 | | 12-20-26<br>(46) | 100 | 0.0 | (ML) Silt With Sand: light olive-brown (2.5Y 5/4), moist to wet; trace mica; sand is fine to medium grained | |
| | | | | | | 86.5 590.6 | |

Bottom of borehole at 86.5 feet.

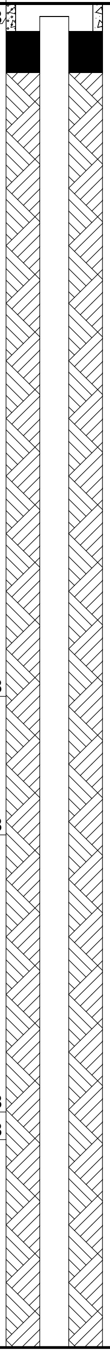
Blaes Environmental
45 East Monterey Way
Phoenix, AZ 85012
Telephone: (602)728 0707
Fax: (602)728 0708

# BORING NUMBER MW12

**CLIENT** Circle K Stores Inc.
**PROJECT NAME** Circle K Store #2211173
**PROJECT NUMBER** 200-1173-01
**PROJECT LOCATION** 5560 Van Nuys Blvd., Van Nuys, CA
**DATE STARTED** 4/10/14 **COMPLETED** 4/10/14
**GROUND ELEVATION** 677.82 ft **HOLE DIAMETER** 10 inches
**DRILLING CONTRACTOR** Cascade Drilling, L.P.
**GROUND WATER LEVEL (ft. bgs):** 81.37
**DRILLING METHOD** Hollow-Stem Auger
**DATE/TIME** 4/17/2014 11:05:00 AM
**DRILL RIG MODEL** CME 85 **DRILLERS NAME** Victor Martinez
**LOGGED BY** K. Martinez
**NOTES** Top of casing = 677.34 ft. bgs
**WELL PERMIT No** 892242-426

| DEPTH (ft) | TIME | SAMPLE TYPE SAMPLE ID | BLOW COUNTS (N VALUE) | RECOVERY % | PID RESPONSE (ppm) | GRAPHIC LOG | MATERIAL DESCRIPTION | |
|---|---|---|---|---|---|---|---|---|
| 0 | | | | | | | | |
| 0.5 | | | | | | | Asphalt 6" Thick | 677.3 |
| 5 | 10:20 | | | 100 | 0.0 | | (SM) Silty Sand: fine- to medium-grained, yellowish brown (10YR 5/4), moist; trace mica | |
| 10 | | | | | | | (SM) Silty Sand: fine- to medium-grained, yellowish brown (10YR 5/4), moist; trace mica | |
| 15 | 09:40 | | 20-22-23 (45) | 100 | 0.0 | | (SM) Silty Sand: fine- to medium-grained, olive-brown (2.5Y 4/3), moist; trace mica | |
| 20 | 09:45 | | 16-18-22 (40) | 100 | 0.0 | | (SM) Silty Sand: fine- to medium-grained, olive-brown (2.5Y 4/3), moist; trace mica | |
| 25.0 | 09:55 | | 18-20-22 (42) | 100 | 0.0 | | (ML) Sandy Silt: olive-brown (2.5Y 4/3), moist; trace mica; sand is fine grained; trace clay | 652.8 |
| 30.0 | 10:00 | | 20-14-20 (34) | 100 | 0.0 | | (SM) Silty Sand: fine- to medium-grained, olive-brown (2.5Y 4/4), moist, trace mica; iron oxide staining | 647.8 |
| 35 | 10:10 | | 11-12-17 (29) | 100 | 0.0 | | (SM) Silty Sand: fine- to coarse-grained, light olive-brown (2.5Y 5/6), moist; trace mica; iron oxide staining; trace angular to subangular gravel up to 1/4" diameter | |
| 40.0 | 10:15 | | 18-22-22 (44) | 100 | 0.0 | | (SW-SM) Sand With Silt: fine- to coarse-grained, olive-brown (2.5Y 4/3), moist; trace subangular gravel up to 1/2" diameter | 637.8 |
| 41.0 | | | | | | | (SM) Silty Sand: fine- to coarse-grained, light olive-brown (2.5Y 5/4) and very dark grayish brown (2.5Y 3/2) mottling, moist; subrounded coarse grains | 636.8 |
| 45 | 10:20 | | 17-21-21 (42) | 100 | 0.0 | | (SM) Silty Sand: fine-grained, olive-brown (2.5Y 4/3), moist; trace mica | |

WELL DIAGRAM



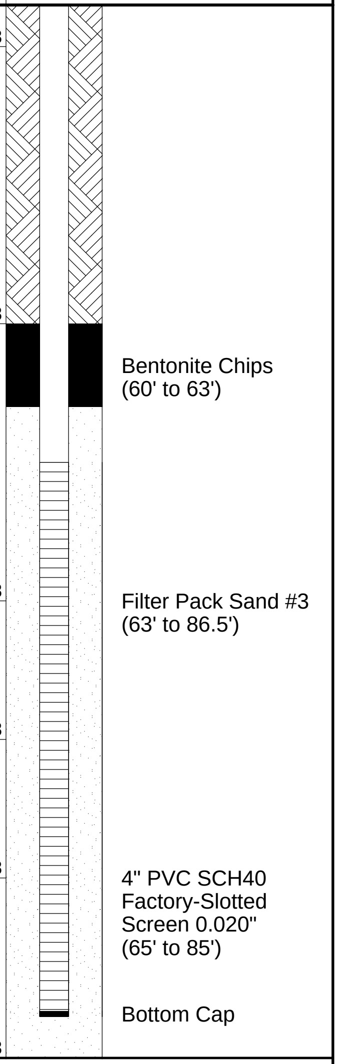
(Continued Next Page)

**CLIENT** Circle K Stores Inc.
**PROJECT NAME** Circle K Store #2211173
**PROJECT NUMBER** 200-1173-01
**PROJECT LOCATION** 5560 Van Nuys Blvd., Van Nuys, CA

| DEPTH (ft) | TIME | SAMPLE TYPE SAMPLE ID | BLOW COUNTS (N VALUE) | RECOVERY % | PID RESPONSE (ppm) | GRAPHIC LOG | MATERIAL DESCRIPTION |
|---|---|---|---|---|---|---|---|
| 50 | 10:30 | | 13-13-13<br>(26) | 100 | 0.0 | | 50.0 — 627.8<br>(ML) Sandy Silt: light olive-brown (2.5Y 5/4), moist; sand is fine grained |
| 55 | 10:35 | | 12-13-15<br>(28) | 100 | 0.0 | | (ML) Sandy Silt: olive-brown (2.5Y 4/4), moist; trace mica; iron oxide staining; sand is fine to medium grained |
| 60 | 10:40 | | 20-22-20<br>(42) | 100 | 0.0 | | 60.0 — 617.8<br>(SP) Sand: fine- to medium-grained, light yellowish brown (2.5Y 6/3), moist; trace subrounded coarse grains |
| 65 | 10:45 | | 20-22-20<br>(42) | 100 | 0.0 | | (SP) Sand: fine- to medium-grained, light olive-brown (2.5Y 5/4), moist |
| 70 | 10:55 | ☒ SS<br>S-70-MW12 | 20-22-20<br>(42) | 100 | 0.0 | | 70.0 — 607.8<br>(ML) Sandy Silt: light olive-brown (2.5Y 5/3), moist; trace mica; sand is fine to medium grained |
| 75 | 11:00 | ☒ SS<br>S-75-MW12 | 18-22-22<br>(44) | 100 | 0.0 | | 75.0 — 602.8<br>(SM) Silty Sand: fine-grained, light olive-brown (2.5Y 5/6), moist to wet; trace mica; iron oxide staining |
| 80 | 11:15 | | 20-22-20<br>(42) | 100 | | | 80.0 — 597.8<br>▼ (ML) Silt With Sand: olive-brown (2.5Y 4/3), wet; trace mica; sand is fine grained |
| 85 | 11:20 | | 18-20-22<br>(42) | 100 | | | (ML) Silt With Sand: olive-brown (2.5Y 4/3), wet; trace mica; sand is fine grained<br>86.5 — 591.3 |

Bottom of borehole at 86.5 feet.

WELL DIAGRAM



Blaes Environmental
45 East Monterey Way
Phoenix, AZ 85012
Telephone: (602)728 0707
Fax: (602)728 0708

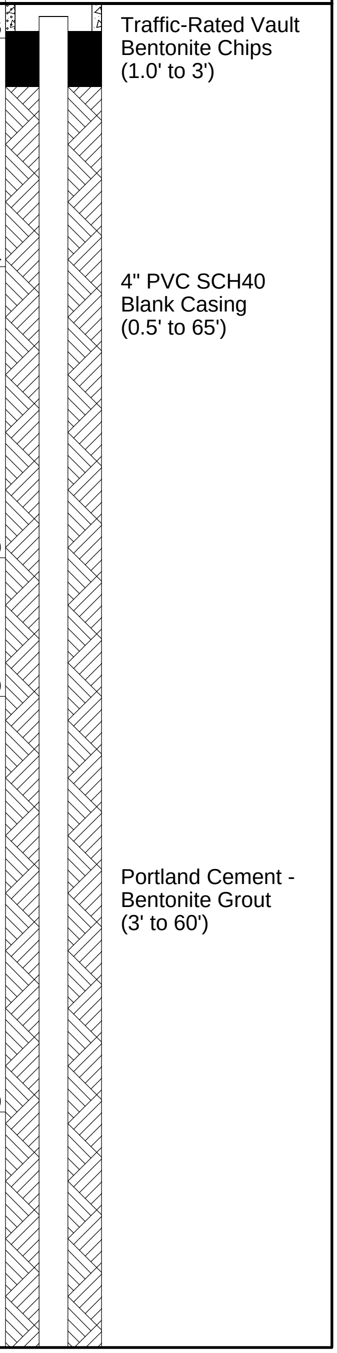
# BORING NUMBER MW13

PAGE 1 OF 2

**CLIENT** Circle K Stores Inc.
**PROJECT NAME** Circle K Store #2211173
**PROJECT NUMBER** 200-1173-01
**PROJECT LOCATION** 5560 Van Nuys Blvd., Van Nuys, CA
**DATE STARTED** 4/8/14 **COMPLETED** 4/8/14
**GROUND ELEVATION** 675.86 ft **HOLE DIAMETER** 10 inches
**DRILLING CONTRACTOR** Cascade Drilling, L.P.
**GROUND WATER LEVEL (ft. bgs):** 77.00
**DRILLING METHOD** Hollow-Stem Auger
**DATE/TIME** 4/18/2014 9:35:00 AM
**DRILL RIG MODEL** CME 85 **DRILLERS NAME** Victor Martinez
**LOGGED BY** K. Martinez
**NOTES** Top of casing = 675.42 ft. bgs
**WELL PERMIT No** 892242-426

| DEPTH (ft) | TIME | SAMPLE TYPE SAMPLE ID | BLOW COUNTS (N VALUE) | RECOVERY % | PID RESPONSE (ppm) | MATERIAL DESCRIPTION |
|---|---|---|---|---|---|---|
| 0 | | | | | | Asphalt 1.33' Thick |
| 1.3 | | | | | | 674.6 |
| 5 | 11:05 | | | 100 | 0.0 | (ML) Sandy Silt: yellowish brown (10YR 5/4), moist: micaceous; sand is fine grained; trace clay |
| 9.5 | | | | | | 666.4 |
| 10 | 12:10 | | | 100 | 0.0 | (SM) Silty Sand: fine-grained, yellowish brown (10YR 5/4), moist; trace mica |
| 15 | 10:00 | | 7-7-10 (17) | 100 | 0.0 | (SM) Silty Sand: fine- to coarse-grained, dark yellowish brown (10YR 4/6), moist; subrounded coarse grains; trace mica |
| 20.0 | | | | | | 655.9 |
| 20 | 10:05 | | 8-11-13 (24) | 100 | 0.0 | (ML) Sandy Silt: light olive-brown (2.5Y 5/6), moist; trace mica; sand is fine to medium grained; trace clay |
| 25.0 | | | | | | 650.9 |
| 25 | 10:15 | | 9-9-13 (22) | 100 | 0.0 | (SM) Silty Sand: fine-grained, light olive-brown (2.5Y 5/4), moist; trace mica; iron oxide staining |
| 30 | 10:20 | | 13-13-22 (35) | 100 | 0.0 | (SM) Silty Sand: fine-grained, olive-brown (2.5Y 4/4), moist; trace mica; trace subrounded gravel up to 1/4" diameter |
| 35 | 10:25 | | 12-16-22 (38) | 100 | 0.0 | (SM) Silty Sand: fine- to coarse-grained, olive-brown (2.5Y 4/4), moist; trace mica; trace subrounded to subangular gravel up to 1/4" diameter |
| 40.0 | | | | | | 635.9 |
| 40 | 10:35 | | 12-15-18 (33) | 100 | 0.0 | (SW-SM) Sand With Silt: fine- to coarse-grained, olive-brown (2.5Y 4/4), moist; trace mica |
| 45 | 10:40 | | 14-18-22 (40) | 100 | 0.0 | (SW-SM) Sand With Silt: fine- to coarse-grained, olive-brown (2.5Y 4/4), moist; trace mica |

WELL DIAGRAM



*(Continued Next Page)*

# BORING NUMBER MW13

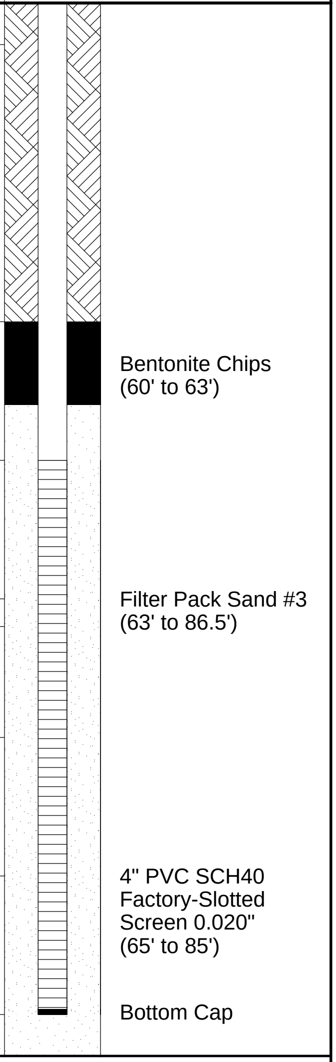
**CLIENT** Circle K Stores Inc.
**PROJECT NAME** Circle K Store #2211173
**PROJECT NUMBER** 200-1173-01
**PROJECT LOCATION** 5560 Van Nuys Blvd., Van Nuys, CA

| DEPTH (ft) | TIME | SAMPLE TYPE SAMPLE ID | BLOW COUNTS (N VALUE) | RECOVERY % | PID RESPONSE (ppm) |
|---|---|---|---|---|---|
| 50 | 10:50 | | 18-20-21 (41) | 100 | 0.0 |
| 55 | 11:00 | | 12-14-19 (33) | 100 | 0.0 |
| 60 | 11:05 | | 12-18-16 (34) | 100 | 0.0 |
| 65 | 11:10 | ☒ SS S-65-MW13 | 12-14-18 (32) | 100 | 0.0 |
| 70 | 11:25 | ☒ SS S-70-MW13 | 12-18-16 (34) | 100 | 0.0 |
| 75 | 11:30 | ☒ SS S-75-MW13 | 18-14-16 (30) | 100 | 0.0 |
| 80 | 11:40 | | 12-14-16 (30) | 100 | 0.0 |
| 85 | 12:05 | | 12-14-18 (32) | 100 | 0.0 |

| Depth | MATERIAL DESCRIPTION | Elevation |
|---|---|---|
| 50.0 | (SM) Silty Sand: fine- to medium-grained, olive-brown (2.5Y 4/3), moist; trace mica; trace subrounded gravel up to 1/4" diameter<br>(SM) Silty Sand: fine-grained, light olive-brown (2.5Y 5/6), moist; trace mica | 625.9 |
| 60.0 | (SW) Sand: fine- to coarse-grained, grayish brown (2.5Y 5/2), moist; subrounded; trace silt; trace subrounded gravel up to 2" diameter | 615.9 |
| 65.0 | (SP-SM) Sand With Silt: fine- to medium-grained, light olive-brown (2.5Y 5/3), moist; iron oxide staining | 610.9 |
| 70.0 | (ML) Sandy Silt: light olive-brown (2.5Y 5/4), moist; sand is fine grained | 605.9 |
| 71.0 | (SP) Sand: fine- to medium-grained, light yellowish brown (2.5Y 6/4), moist; iron oxide staining | 604.9 |
| 75.0 | ▼ (SM) Silty Sand: fine-grained, very dark grayish brown (2.5Y 3/2), moist to wet; trace mica | 600.9 |
| 80.0 | (ML) Silt With Sand: olive-brown (2.5Y 4/3), moist; trace mica; iron oxide staining; sand is fine grained | 595.9 |
| 85.0 | (SM) Silty Sand: fine- to medium-grained, olive-brown (2.5Y 4/3), wet; trace mica | 590.9 |
| 86.5 | | 589.4 |

Bottom of borehole at 86.5 feet.

WELL DIAGRAM



**WAYNE PERRY, INC.**
8281 Commonwealth Avenue
Buena Park, California 90621
(714) 826-0352
www.wpinc.com

# Log of Boring/Well SVE-1

PROJECT: *Sawyer Petroleum*

SURFACE ELEVATION: *Not Measured*

LOCATION: *14117 AETNA ST., VAN NUYS, CA*

TOTAL DEPTH: *151 5 feet*

BORING DIAMETER: *8 inches*

PROJECT NO : *06 202*

DEPTH TO FIRST SATURATION: *N/A*

DATE BEGAN: *9/7/06* FINISHED: *9/12/06*

TOP OF WELL CASING ELEVATION: *N/A*

DRILLING COMPANY: *Water Development Corporation*

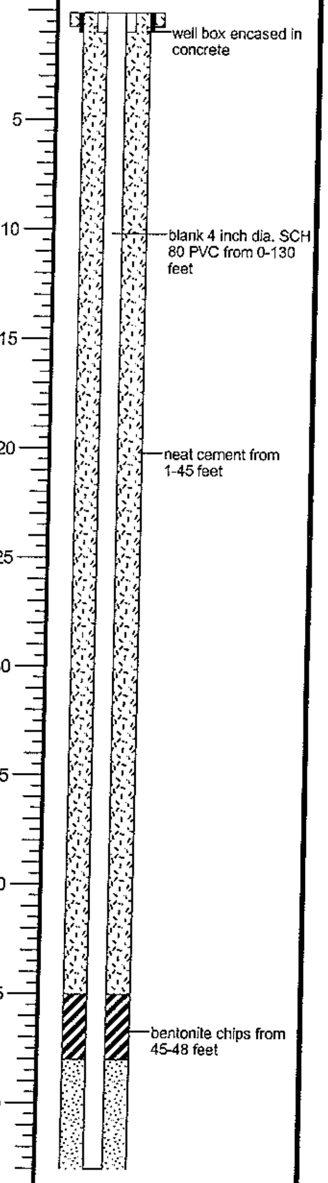
STATIC GW ELEVATION: DATE: *N/A*

DRILLING METHOD: *Hollow-Stem Auger*

LOGGED BY: *E. Kuhn* CHECKED BY: *D. Henry*

This log is a representation of subsurface conditions at the time and place of drilling. With the passage of time or at any other location, there may be consequential changes in conditions

| DEPTH (feet) | Samples | Sample I D | Time | Blow Counts (per 6 inches) | PID/LEL (ppm/%) | Geologic Description | Soil Class |
|---|---|---|---|---|---|---|---|
| 0–7 | | | | | | **AIRKNIFED TO 7 FEET** | |
| 10 | ⊠ | SVE-1d10 | 1019 | 10/12/15 | 0.0 | **SILT with Sand** - dark brown [10YR 3/3], very stiff moist; fine- to medium-grained; trace clay | ml |
| 15 | ⊠ | SVE-1d15 | 1027 | 11/15/20 | 0.0 | **SILT** - dark brown [10YR 3/3], very stiff, moist; trace clay; trace amount of fine gravel; trace fine- to medium-grained sand | ml |
| 20 | ⊠ | SVE-1d20 | 1042 | 15/15/20 | 0 3 | **Sandy SILT** - dark brown [10YR 3/3] dense, moist; fine- to medium-grained sand; trace clay | ml |
| 25 | ⊠ | SVE-1d25 | 1053 | 15/18/22 | 0.0 | | |
| 30 | ⊠ | SVE-1d30 | 1101 | 10/12/18 | 0.0 | | |
| 35 | ⊠ | SVE-1d35 | 1109 | 15/17/25 | 0 0 | **SILT** - dark yellowish brown [10YR 3/4] very stiff moist; trace clay; trace fine- to medium-grained sand.<br>dark brown [7 5YR 3/4] hard | ml |
| 40 | ⊠ | SVE-1d40 | 1116 | 10/16/22 | 2.3 | | |
| 45 | ⊠ | SVE-1d45 | 1232 | 17/17/18 | 4.4 | **Silty SAND** - fine- to medium-grained, very dark grayish brown [10YR 3/2], dense moist; trace amount of fine gravel | sm |
| 50 | ⊠ | SVE-1d50 | 1246 | 25/25/30 | 25.1 | **SAND** - fine- to coarse-grained, yellow brown [10YR 5/4], dense, moist.<br>**SILT with Sand** - dark brown [10YR 3/3], hard, moist; fine- to medium-grained sand; trace clay | sp<br>ml |
| | | | | | | | ml |



Remarks/Notes: 1) PID Used:

**WAYNE PERRY, INC.**
8281 Commonwealth Avenue
Buena Park, California 90621
(714) 826-0352
www.wpinc com

# Log of Boring/Well SVE-1

PROJECT: *Sawyer Petroleum*

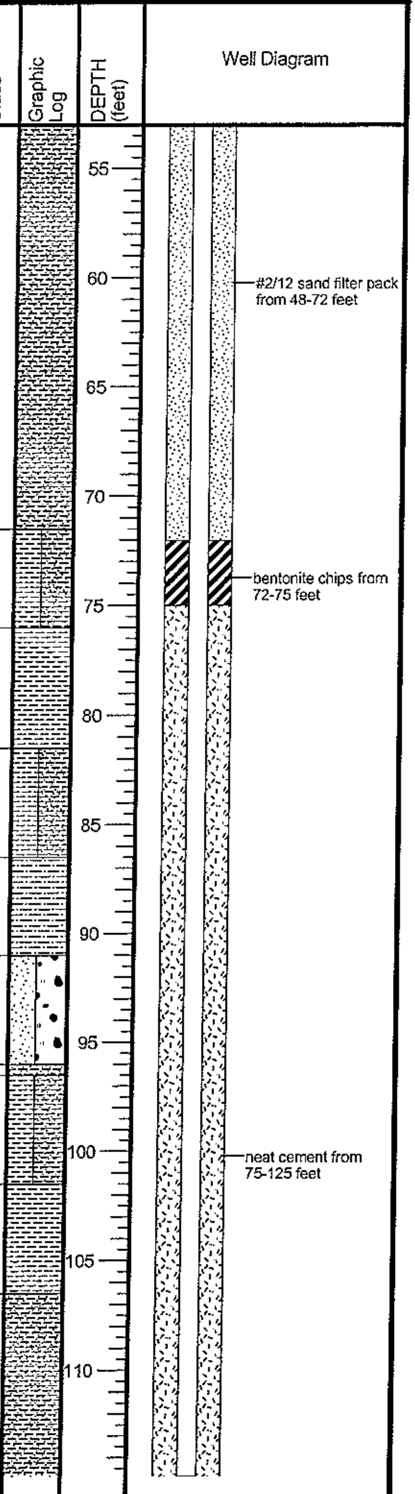
PROJECT NO : *06.202*

LOCATION: *14117 AETNA ST., VAN NUYS, CA*

DATE BEGAN: *9/7/06* FINISHED: *9/12/06*

This log is a representation of subsurface conditions at the time and place of drilling. With the passage of time or at any other location there may be consequential changes in conditions.

| DEPTH (feet) | Samples | Sample I D. | Time | Blow Counts (per 6 inches) | PID/LEL (ppm/%) | Geologic Description | Soil Class |
|---|---|---|---|---|---|---|---|
| 55 | | SVE-1d55 | 1310 | 20/25/25 | 22 8 | **Sandy SILT** - dark brown [10YR 3/3]. hard moist; fine- to medium-grained sand; very dark grayish brown [10YR 3/3]; | |
| 60 | | SVE-1d60 | 1407 | 10/12/20 | 59 7 | dark brown [10YR 3/3] trace amount of fine gravel; | |
| 65 | | | | | | no sample recovery at 65 feet | |
| 70 | | SVE-1d70 | 1031 | 13/20/25 | 180 | **SILT with Sand** - dark yellowish brown [10YR 3/4], hard, moist; fine- to medium-grained sand; trace amount of fine gravel | ml |
| 75 | | SVE-1d75 | 1043 | 32/50 | 39 6 | **SILT** - dark brown [10YR 3/3], hard, moist; trace fine- to medium-grained sand; trace amount of fine gravel | ml |
| 80 | | SVE-1d80 | 1103 | 20/23/27 | 134 | **SILT with Sand** - very dark grayish brown [10YR 3/2], hard, moist; fine- to medium-grained sand; trace amount of fine gravel. | ml |
| 85 | | SVE-1d85 | 1122 | 19/20/21 | 29.4 | **Silty SAND** - fine- to medium-grained, brown [10YR 4/3], dense moist; trace amount of fine and coarse gravel;<br>olive brown [2.5Y 4/3], very dense. | sm |
| 90 | | SVE-1d90 | 1136 | 25/50 | 46 4 | **SAND with Gravel** - fine- to coarse-grained dark grayish brown [2 5Y 5/2], very dense moist; fine and coarse gravel | ml |
| 95 | | SVE-1d95 | 1331 | 20/22/25 | 63.8 | **Sandy SILT** - brown [10YR 4/3], hard, moist; fine- to medium-grained sand; trace clay.<br>**SILT with Sand** - olive brown [2.5Y 4/3] hard, moist; fine-grained sand | ml<br>ml |
| 100 | | SVE-1d100 | 1356 | 19/22/26 | 64.8 | **SILT** - dark olive brown [2.5Y 3/3], hard, moist; trace fine- to medium-grained sand. | ml |
| 105 | | SVE-1d105 | 1458 | 35-50 | 2.1 | **Sandy SILT** - dark brown [7 5YR 3/3] hard. moist; fine- to medium-grained sand. | ml |
| 110 | | SVE-1d110 | 1523 | 22/23/27 | 1 7 | brown [10YR 4/3] trace amount fine gravel. | |



Remarks/Notes: 1) PID Used:

**WAYNE PERRY, INC.**
8281 Commonwealth Avenue
Buena Park, California 90621
(714) 826-0352
www.wpinc.com

# Log of Boring/Well SVE-1

PROJECT: *Sawyer Petroleum*

PROJECT NO.: *06.202*

LOCATION: *14117 AETNA ST., VAN NUYS, CA*

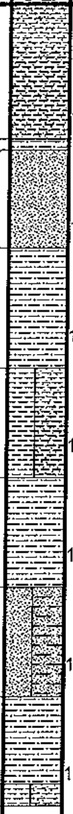
DATE BEGAN: *9/7/06*

FINISHED: *9/12/06*

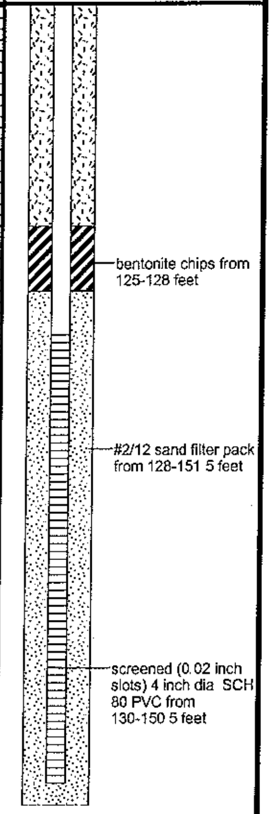
This log is a representation of subsurface conditions at the time and place of drilling. With the passage of time or at any other location, there may be consequential changes in conditions.

| DEPTH (feet) | Samples | Sample ID | Time | Blow Counts (per 6 inches) | PID/LEL (ppm/%) | Geologic Description | Soil Class |
|---|---|---|---|---|---|---|---|
|  | ☒ | SVE-1d115 | 1533 | 12/16/22 | 1.5 |  |  |
| 120 |  |  |  |  |  | **Silty SAND** - fine- to medium-grained brown [10YR 4/3], dense, moist. | sm |
|  |  |  |  |  |  | **SAND** - fine- to coarse-grained light olive brown [2.5Y 5/3] dense, moist | sp |
| 125 |  |  |  |  |  | **Silty SAND** - fine- to medium-grained olive brown [2.5Y 4/4] very dense, moist | sm |
| 130 |  |  |  |  |  | **SILT with Sand** - dark brown [7.5YR 3/4] hard moist; fine- to medium-grained sand | ml |
| 135 |  |  |  |  |  | **Silty SAND** - fine- to medium-grained dark brown [7.5YR 3/4], dense moist | sm |
| 140 |  |  |  |  |  | **SAND with Silt** - fine- to medium-grained, yellowish brown [10YR 5/4] very dense moist | sp |
| 145 |  |  |  |  |  | **Silty SAND** - fine- to medium-grained dark yellowish brown [10YR 4/4] very dense moist; trace amount of fine gravel | sm |
| 150 |  |  |  |  |  | **SILT with Sand** - dark yellowish brown [10YR 3/4], hard, moist; fine-grained sand. | ml |
|  |  |  |  |  |  | Bottom at 151.5 feet |  |
| 155 |  |  |  |  |  |  |  |
| 160 |  |  |  |  |  |  |  |
| 165 |  |  |  |  |  |  |  |
| 170 |  |  |  |  |  |  |  |
| 175 |  |  |  |  |  |  |  |

Graphic Log



Well Diagram



Remarks/Notes: 1) PID Used:

**WAYNE PERRY, INC.**
8281 Commonwealth Avenue
Buena Park, California 90621
(714) 826-0352
www.wpinc.com

# Log of Boring/Well SVE-2

PROJECT: *Sawyer Petroleum*

SURFACE ELEVATION: *Not Measured*

LOCATION: *14117 AETNA ST., VAN NUYS, CA*

TOTAL DEPTH: *152 feet*

BORING DIAMETER: *8 inches*

PROJECT NO.: *06.202*

DEPTH TO FIRST SATURATION: *N/A*

DATE BEGAN: *9/5/06* FINISHED: *9/7/06*

TOP OF WELL CASING ELEVATION: *N/A*

DRILLING COMPANY: *Water Development Corporation*

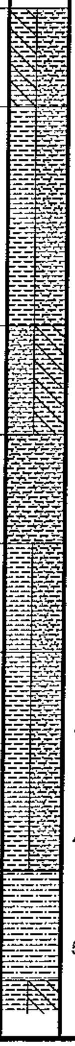
STATIC GW ELEVATION: DATE: *N/A*

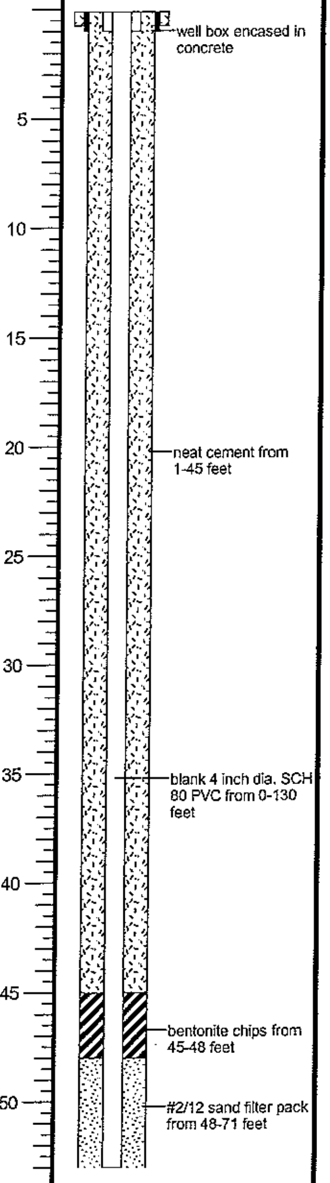
DRILLING METHOD: *Hollow-Stem Auger*

LOGGED BY: *E. Kuhn* CHECKED BY: *D. Henry*

This log is a representation of subsurface conditions at the time and place of drilling. With the passage of time or at any other location there may be consequential changes in conditions

| DEPTH (feet) | Samples | Sample I.D | Time | Blow Counts (per 6 inches) | PID/LEL (ppm/%) | Geologic Description | Soil Class |
|---|---|---|---|---|---|---|---|
| 5 | | | | | | **AIRKNIFED TO 7 FEET** | |
| 10 | | SVE-2d10 | 1049 | 6/6/10 | 0.1 | **SILT with Sand and Clay** - dark yellowish brown [10YR 3/4], very stiff, moist; fine- to medium-grained sand; trace amount of fine gravel | ml |
| 15 | | SVE-2d15 | 1103 | 5/8/10 | 0.0 | **SILT with Sand** - dark yellowish brown [10YR 3/4], very stiff, moist; fine- to medium-grained sand; trace clay | ml |
| 20 | | SVE-2d20 | 1114 | 6/10/12 | 0.0 | | |
| 25 | | SVE-2d25 | 1117 | 12/15/15 | 0.0 | **Sandy SILT with Clay** - dark brown [10YR 3/3] very stiff, moist; fine- to medium-grained sand; trace amount of fine gravel | ml |
| 30 | | SVE-2d30 | 1126 | 16/20/23 | 0.6 | **Sandy SILT** - dark brown [10YR 3/3] very stiff, moist; fine- to medium-grained sand; trace clay | ml |
| 35 | | SVE-2d35 | 1134 | 10/16/20 | 0.5 | **SILT with Sand** - dark brown [10YR 3/3], hard, moist; fine- to medium-grained sand; trace clay. | ml |
| 40 | | SVE-2d40 | 1255 | 17/20/22 | 45 0 | **SILT with Sand** - very dark grayish brown [10YR 3/2] hard moist; fine- to medium-grained sand | ml |
| 45 | | SVE-2d45 | 1307 | 22/23/25 | 76.7 | | |
| 50 | | SVE-2d50 | 1316 | 18/25/21 | 72 | **Silty SAND** - fine- to medium-grained olive brown [2 5Y 4/4] dense moist. | sm |
| | | | | | | | ml |





Remarks/Notes: 1) PID Used:

**WAYNE PERRY, INC.**
8281 Commonwealth Avenue
Buena Park, California 90621
(714) 826-0352
www.wpinc.com

# Log of Boring/Well SVE-2

PROJECT: *Sawyer Petroleum*

PROJECT NO.: *06.202*

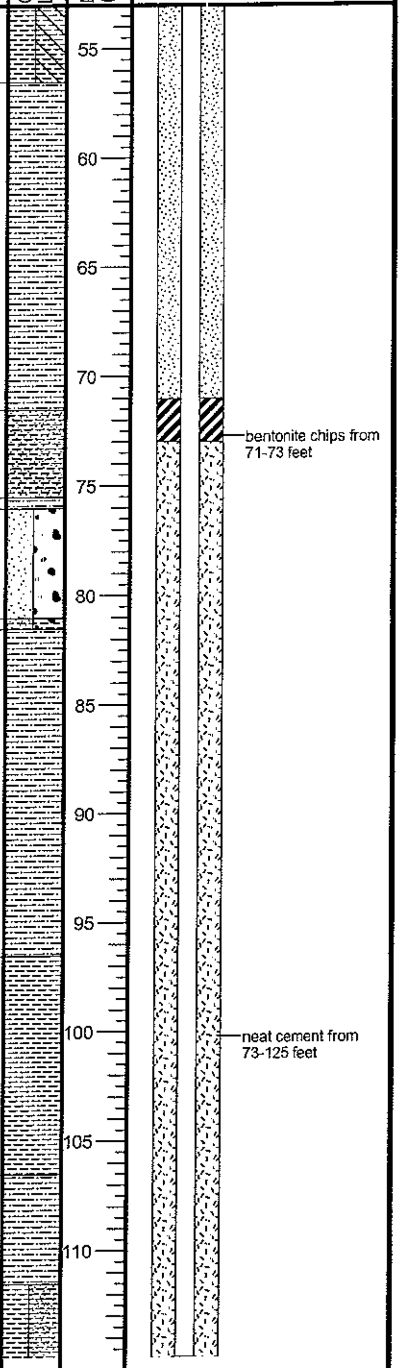
LOCATION: *14117 AETNA ST., VAN NUYS, CA*

DATE BEGAN: *9/5/06* FINISHED: *9/7/06*

This log is a representation of subsurface conditions at the time and place of drilling. With the passage of time or at any other location, there may be consequential changes in conditions.

| DEPTH (feet) | Samples | Sample ID | Time | Blow Counts (per 6 inches) | PID/LEL (ppm/%) | Geologic Description | Soil Class |
|---|---|---|---|---|---|---|---|
| | | | | | | **SILT with Clay** - dark brown [10YR 3/3], hard moist; trace fine- to medium-grained sand | |
| 55 | | SVE-2d55 | 1321 | 12/14/16 | 116 | **Silty SAND** - fine- to medium-grained, dark olive brown [2 5Y 3/3] dense moist; | sm |
| 60 | | SVE-2d60 | 1331 | 16/19/22 | 325 | | |
| 65 | | SVE-2d65 | 1338 | 20/23/23 | 85 2 | trace amount of fine gravel. | |
| 70 | | SVE-2d70 | 1412 | 12/14/18 | 35.4 | **Sandy SILT** - dark olive brown [2 5Y 3/3] hard moist; fine- to medium-grained sand | ml |
| 75 | | SVE-2d75 | 1425 | 12/20/20 | 9.1 | **Silty SAND** - fine- to medium-grained, dark olive brown [2.5Y 3/3], dense, moist; trace clay.<br>**SAND with Gravel** - fine- to coarse-grained, dark grayish brown [2 5Y 4/2] dense moist; fine to coarse gravel. | sm<br>sp |
| 80 | | SVE-2d80 | 1441 | 12/14/19 | 119 | **SAND with Silt and Gravel** - fine- to coarse-grained, dark grayish brown [10YR 4/2] dense, moist; fine to coarse gravel.<br>**Silty SAND** - fine- to medium-grained. dark brown [10YR 3/3] dense, moist; trace amount of fine gravel; | ml<br>sm |
| 85 | | SVE-2d85 | 1452 | 35/51 | 3.4 | very dark grayish brown [10YR 3/3]. very dense; | |
| 90 | | SVE-2d90 | 1506 | 35/50 | 0.0 | olive brown [2 5Y 4/3]. | |
| 95 | | SVE-2d95 | 1519 | 19/23/22 | 112 | **SILT** - dark olive brown [2.5Y 3/3], hard, moist; trace clay; trace amount of fine gravel; trace fine- to medium-grained sand | ml |
| 100 | | SVE-2d100 | 1535 | 16/20/20 | 73 | | |
| 105 | | SVE-2d105 | 0819 | 12/15/19 | 12.4 | **Silty SAND** - fine- to medium-grained, dark brown [7 5YR 3/4], dense moist; trace amount of fine gravel;<br>very dense. | sm |
| 110 | | SVE-2d110 | 0851 | 23/25/27 | 2.6 | **SILT with Sand** - dark brown [7 5YR 3/3] hard moist; fine- to medium-grained sand | ml |

Graphic Log | DEPTH (feet) | Well Diagram



Remarks/Notes: 1) PID Used:

**WAYNE PERRY, INC.**
8281 Commonwealth Avenue
Buena Park, California 90621
(714) 826-0352
www.wpinc.com

# Log of Boring/Well SVE-2

PROJECT: *Sawyer Petroleum*

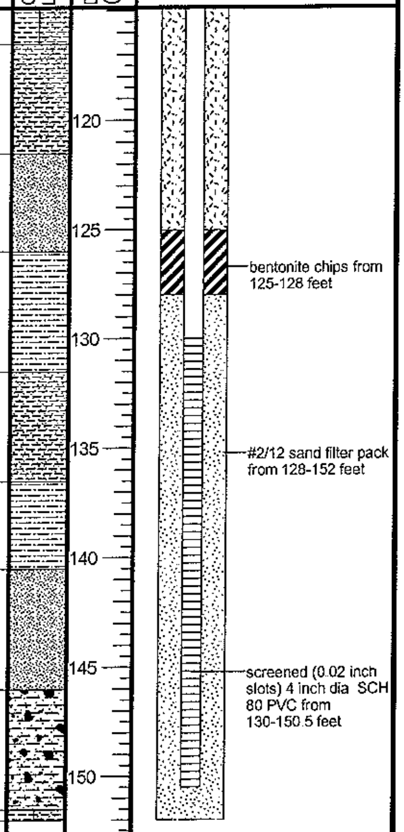
PROJECT NO.: *06.202*

LOCATION: *14117 AETNA ST., VAN NUYS, CA*

DATE BEGAN: *9/5/06* FINISHED: *9/7/06*

This log is a representation of subsurface conditions at the time and place of drilling. With the passage of time or at any other location, there may be consequential changes in conditions

| Sample ID | Time | Blow Counts (per 6 inches) | PID/LEL (ppm/%) | Geologic Description | Soil Class |
|---|---|---|---|---|---|
| SVE-2d115 | 0927 | 18/20/22 | 22.4 | **Sandy SILT** - dark grayish brown [10YR 4/2] hard moist; trace amount of fine gravel | ml |
| SVE-2d120 | 0942 | 23/50 | 144 | **SAND** - fine- to medium-grained yellowish brown [10YR 5/4] dense, moist;<br>very dense. | sp |
| SVE-2d125 | 0951 | 25/23/28 | 79.2 | **Silty SAND** - fine- to medium-grained, dark yellowish brown [10YR 3/6] very dense, moist | sm |
| SVE-2d130 | 1000 | 19/23/28 | 59.4 | **Sandy SILT** - dark olive brown [2.5Y 3/3], hard, moist; fine- to medium-grained sand; trace clay | ml |
| SVE-2d135 | 1013 | 21/24/25 | 29.3 | **Silty SAND** - fine- to medium-grained, very dark grayish brown [10YR 3/2] dense, moist | sm |
| SVE-2d140 | 1034 | 20/27/30 | 25.9 | **SAND** - fine- to coarse-grained, yellowish brown [10YR 5/4], very dense, moist; trace amount of fine gravel | sp |
| SVE-2d145 | 1056 | 23/50 | 6.2 | **Silty SAND with Gravel** - fine- to coarse-grained very dark grayish brown [10YR 3/2], very dense, moist; fine gravel | sm |
| SVE-2d150 | 1103 | 23/29/33 | 5.4 | **SILT with Sand** - very dark grayish brown [10YR 3/2], hard, moist; fine- to medium-grained sand; trace amount of fine gravel. | ml |
| | | | | Bottom at 152 feet | |



Remarks/Notes: 1) PID Used:

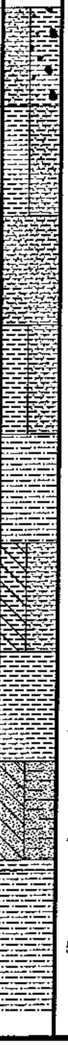
**WAYNE PERRY, INC.**
8281 Commonwealth Avenue
Buena Park, California 90621
(714) 826-0352
www.wpinc.com

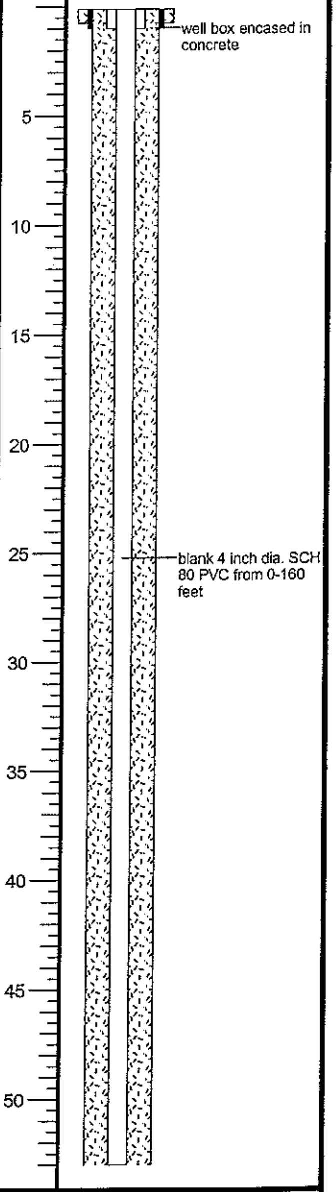
# Log of Boring/Well W-8

| | |
|---|---|
| PROJECT: *Sawyer Petroleum* | SURFACE ELEVATION: *Not Measured* |
| LOCATION: *14117 AETNA ST., VAN NUYS, CA* | TOTAL DEPTH: *193 feet* BORING DIAMETER: *10 inches* |
| PROJECT NO.: *06 202* | DEPTH TO FIRST SATURATION: *173 feet* |
| DATE BEGAN: *9/12/06* FINISHED: *9/18/06* | TOP OF WELL CASING ELEVATION: *N/A* |
| DRILLING COMPANY: *Water Development Corporation* | STATIC GW ELEVATION: DATE: *N/A* |
| DRILLING METHOD: *Hollow-Stem Auger* | LOGGED BY: *E. Kuhn* CHECKED BY: *D. Henry* |

This log is a representation of subsurface conditions at the time and place of drilling. With the passage of time or at any other location, there may be consequential changes in conditions

| Sample ID | Time | Blow Counts (per 6 inches) | PID/LEL (ppm/%) | Geologic Description | Soil Class |
|---|---|---|---|---|---|
| | | | | **AIRKNIFED TO 7 FEET** | |
| | | | | **Sandy SILT with Gravel** - dark brown [7.5YR 3/3], hard moist; fine- to medium-grained sand; fine gravel | ml |
| W-8d10 | 1017 | 10/13/20 | 3.7 | | |
| | | | | **SILT with Sand** - brown [7.5YR 4/4], hard, moist; fine-grained sand; trace amount of fine gravel | ml |
| W-8d15 | 1023 | 9/15/20 | 2.6 | | |
| | | | | **Sandy SILT** - dark brown [7.5YR 3/3], hard, moist; fine- to medium-grained; trace clay | ml |
| W-8d20 | 1029 | 10/18/20 | 0.1 | | |
| | | | | **SILT with Sand** - dark brown [7.5YR 3/3], hard moist; fine- to medium-grained sand; trace clay | ml |
| W-8d25 | 1039 | 13/17/18 | 0.1 | | |
| | | | | **Silty SAND** - fine- to medium-grained, dark brown [7.5YR 3/4], dense, moist; trace amount of fine gravel | ml |
| W-8d30 | 1042 | 20/27/30 | 0.0 | | |
| | | | | **Clayey Silty SAND** - fine- to medium-grained dark brown [7.5YR 3/4] dense moist; trace amount of fine gravel. | sm |
| W-8d35 | 1048 | 15/15/20 | 1.9 | | |
| | | | | **SILT** - dark brown [7.5YR 3/4] hard, moist; trace amount of fine-grained sand | ml |
| W-8d40 | 1055 | 18/19/22 | 2.7 | | |
| | | | | **Clayey Sandy SILT** - dark yellowish brown [10YR 3/4], hard, moist; fine- to medium-grained sand | ml |
| W-8d45 | 1100 | 15/19/22 | 62.9 | | |
| | | | | **SILT** - very dark brown [10YR 2/2], hard, moist. | ml |
| | | | | **Silty SAND** - fine- to medium-grained, dark yellowish brown [10YR 4/4], dense, moist;<br>dark brown [10YR 3/3] very dense | sm |
| W-8d50 | 1110 | 20/23/27 | 12.6 | | |





Remarks/Notes: 1) PID Used:

# Log of Boring/Well W-8

PROJECT: *Sawyer Petroleum*

PROJECT NO.: *06 202*

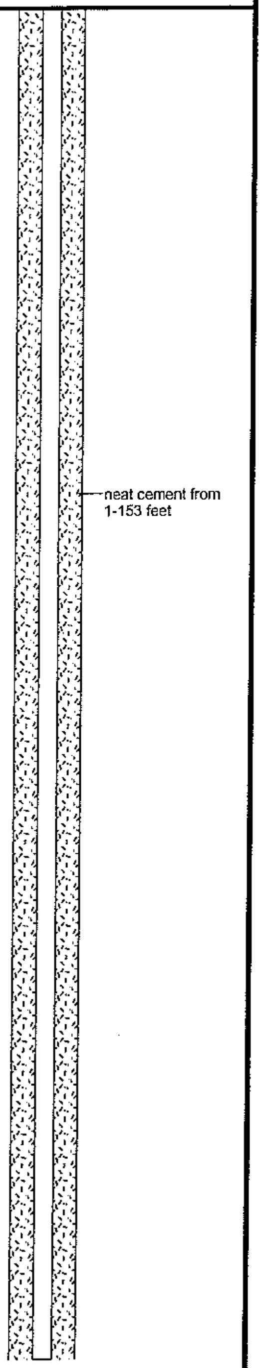
LOCATION: *14117 AETNA ST., VAN NUYS, CA*

DATE BEGAN: *9/12/06* FINISHED: *9/18/06*

This log is a representation of subsurface conditions at the time and place of drilling. With the passage of time or at any other location, there may be consequential changes in conditions

| DEPTH (feet) | Sample I D | Time | Blow Counts (per 6 inches) | PID/LEL (ppm/%) | Geologic Description | Soil Class |
|---|---|---|---|---|---|---|
| 55 | W-8d55 | 1117 | 15/18/31 | 1 5 | **Clayey Sandy SILT** - very dark grayish brown [10YR 3/2] hard moist; fine- to medium-grained sand. | ml |
| | | | | | **Sandy SILT** - dark brown [10YR 3/3] hard moist; fine- to medium-grained sand; trace amount of fine gravel. | ml |
| 60 | W-8d60 | 1129 | 10/18/24 | 12.9 | **Silty SAND** - fine- to medium-grained, dark yellowish brown [10YR 3/4] dense moist; trace amount of fine gravel. | sm |
| 65 | W-8d65 | 1227 | 20/25/37 | 63 1 | | |
| 70 | W-8d70 | 2 | 14/30/37 | 1.8 | **Clayey Silty SAND** - fine- to medium-grained, strong brown [7 5YR 3/4], very dense moist; trace amount of fine and coarse gravel | sm |
| 75 | W-8d75 | 1307 | 33/50 | 206 | **Silty SAND** - fine- to medium-grained, dark yellowish brown [10YR 3/4] dense moist. | sm |
| 80 | W-8d80 | 1339 | 19/20/25 | 15.8 | | |
| 85 | W-8d85 | 1418 | 35/50 | 19 7 | **Clayey SILT** - dark gray [10YR 4/1] hard moist | ml |
| 90 | W-8d90 | 1423 | 20/27/42 | 24.9 | **SILT** - dark grayish brown [2 5Y 4/2], hard moist. | ml |
| 95 | W-8d95 | 1436 | 22/31/38 | 85.9 | **Silty SAND** - fine- to medium-grained olive brown [2.5Y 4/3] very dense moist | sm |
| 100 | W-8d100 | 1443 | 25/50 | 3 4 | **Sandy SILT with Clay** - dark olive brown [ 2 5Y 3/3] hard, moist; fine- to medium-grained sand | ml |
| 105 | W-8d105 | 1458 | 10/25/33 | 12.9 | **Silty SAND** - fine- to medium-grained, dark yellowish brown [10YR 3/6] very dense, moist; trace amount of fine gravel. | sm |
| 110 | W-8d110 | 1506 | 29/25/35 | 3.9 | **Clayey Sandy SILT** - olive brown [2.5Y 4/4], hard moist; fine- to medium-grained sand | ml |

Well Diagram



Remarks/Notes: 1) PID Used:

**WAYNE PERRY, INC.**
8281 Commonwealth Avenue
Buena Park, California 90621
(714) 826-0352
www.wpinc.com

# Log of Boring/Well W-8

PROJECT: *Sawyer Petroleum*

PROJECT NO : *06.202*

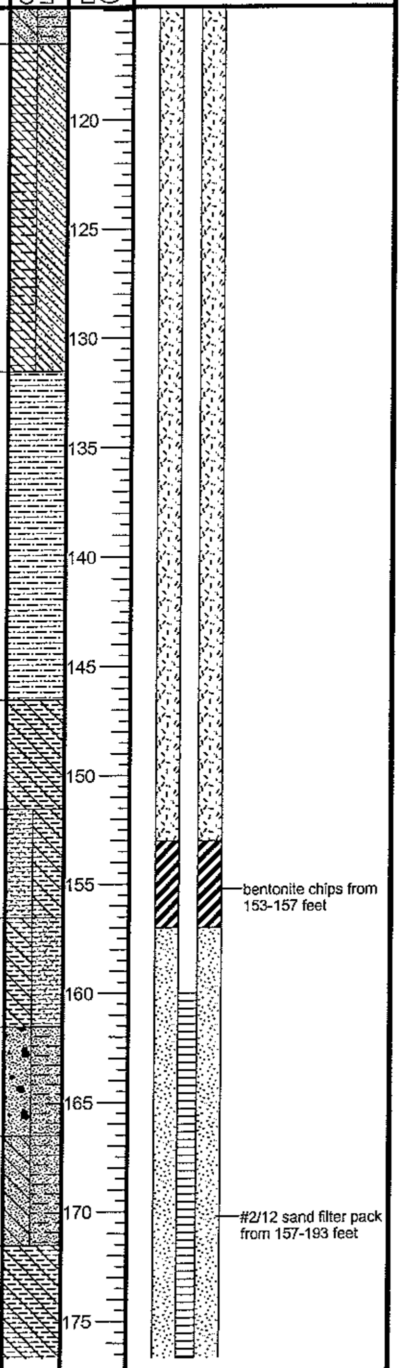
LOCATION: *14117 AETNA ST., VAN NUYS, CA*

DATE BEGAN: *9/12/06* FINISHED: *9/18/06*

This log is a representation of subsurface conditions at the time and place of drilling. With the passage of time or at any other location there may be consequential changes in conditions.

| DEPTH (feet) | Samples | Sample I.D. | Time | Blow Counts (per 6 inches) | PID/LEL (ppm/%) | Geologic Description | Soil Class |
|---|---|---|---|---|---|---|---|
| | | W-8d115 | 1519 | 28/32/35 | 0.9 | **SILT with Clay and Sand** - brown [10YR 4/3]. hard moist; fine- to medium-grained sand; | ml |
| 120 | | | | | | no sample recovery at 120 feet; | |
| 125 | | | | | | no sample recovery at 125 feet. | |
| 130 | | W-8d130 | 1112 | 10/30/30 | 37.3 | **Silty SAND** - fine- to medium-grained, dark yellowish brown [10YR 3/6] very dense moist; | sm |
| 135 | | W-8d135 | 1124 | 19/17/24 | 12 1 | dark brown [10YR 3/3] dense. trace amount of fine gravel; | |
| 140 | | | | | | no sample recovery at 140 feet | |
| 145 | | W-8d145 | 1222 | 15/20/30 | 0.1 | **Clayey SILT** - dark olive brown [2 5Y 3/3], hard moist; trace fine- to medium-grained; trace amount of fine gravel. | ml |
| 150 | | W-8d150 | 1319 | 30/32/35 | 16.1 | **Sandy SILT with Clay** - dark olive brown [2.5Y 3/3], very dense, moist; fine- to medium-grained. | ml |
| 155 | | W-8d155 | 1339 | 18/18/21 | 0.0 | **Clayey SILT with Sand** - dark brown [10YR 3/3], hard moist; fine- to medium-grained | ml |
| 160 | | W-8d160 | 1401 | 19/25/20 | 0.0 | **Sandy Clayey SILT with Gravel** - dark grayish brown [10YR 4/2], hard, moist; fine- to coarse-grained sand; fine gravel. | ml |
| 165 | | W-8d165 | 1435 | 18/20/25 | 0.0 | **Clayey Sandy SILT** - dark olive brown [ 2.5Y 3/3], hard, moist; fine- to medium-grained sand. | ml |
| 170 | | W-8d170 | 1450 | 20/20/29 | 0.0 | **Clayey SILT** - dark olive brown [2.5Y 3/3], hard very moist; trace amount of fine-grained sand; | ml |
| ▽ | | | | | | | |
| 175 | | | | | | | |

Graphic Log | DEPTH (feet) | Well Diagram



Remarks/Notes: 1) PID Used:

**WAYNE PERRY, INC.**
8281 Commonwealth Avenue
Buena Park, California 90621
(714) 826-0352
www.wpinc.com

# Log of Boring/Well W-8

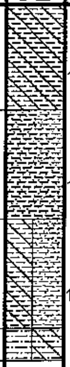
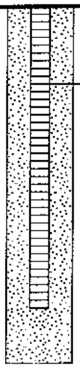
PROJECT: *Sawyer Petroleum*

PROJECT NO.: *06 202*

LOCATION: *14117 AETNA ST., VAN NUYS, CA*

DATE BEGAN: *9/12/06* FINISHED: *9/18/06*

This log is a representation of subsurface conditions at the time and place of drilling. With the passage of time or at any other location, there may be consequential changes in conditions.

| DEPTH (feet) | Samples | Sample I D | Time | Blow Counts (per 6 inches) | PID/LEL (ppm/%) | Geologic Description | Soil Class | Graphic Log | DEPTH (feet) | Well Diagram |
|---|---|---|---|---|---|---|---|---|---|---|
| | | W-8d175 | 1506 | 20/20/25 | 0.0 | saturated; trace amount of fine- to medium-grained sand | |  | |  screened (0 02 inch slots) 4 inch dia SCH 80 PVC from 160-190.5 feet |
| 180 | | W-8d180 | 1543 | 19/20/29 | 0.0 | **Sandy SILT** - olive brown [2.5Y 4/4] hard moist; fine- to medium-grained sand | ml | | 180 | |
| 185 | | W-8d185 | 1611 | 18/19/30 | 0.0 | **Clayey SILT with Sand** - olive brown [2 5Y 4/3] hard moist; fine- to medium-grained sand | ml | | 185 | |
| 190 | | W-8d190 | 1620 | 19/25/25 | 0.0 | **Silty SAND with Clay** - fine- to medium-grained dark brown [7.5YR 3/4], dense, moist.<br>Bottom at 193 feet | sm | | 190 | |
| 195 | | | | | | | | | 195 | |
| 200 | | | | | | | | | 200 | |
| 205 | | | | | | | | | 205 | |
| 210 | | | | | | | | | 210 | |
| 215 | | | | | | | | | 215 | |
| 220 | | | | | | | | | 220 | |
| 225 | | | | | | | | | 225 | |
| 230 | | | | | | | | | 230 | |
| 235 | | | | | | | | | 235 | |

Remarks/Notes: 1) PID Used:

**WAYNE PERRY, INC.**
8281 Commonwealth Avenue
Buena Park, California 90621
(714) 826-0352
www wpinc com

# Log of Boring/Well W-9

PROJECT: *Sawyer Petroleum*

SURFACE ELEVATION: *Not Measured*

LOCATION: *14117 AETNA ST., VAN NUYS, CA*

TOTAL DEPTH: *193 feet*

BORING DIAMETER: *10 inches*

PROJECT NO : *06 202*

DEPTH TO FIRST SATURATION: *170 feet*

DATE BEGAN: *9/18/06* FINISHED: *9/29/06*

TOP OF WELL CASING ELEVATION: *N/A*

DRILLING COMPANY: *Water Development Corporation*

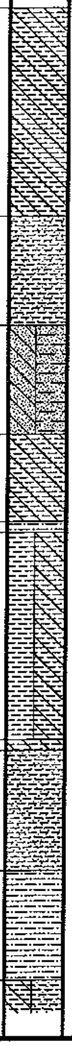
STATIC GW ELEVATION: DATE: *N/A*

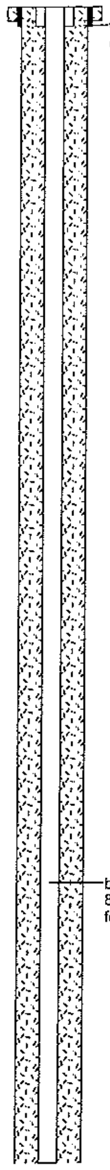
DRILLING METHOD: *Hollow-Stem Auger*

LOGGED BY: *E. Kuhn* CHECKED BY: *D. Henry*

This log is a representation of subsurface conditions at the time and place of drilling. With the passage of time or at any other location, there may be consequential changes in conditions

| DEPTH (feet) | Samples | Sample I D. | Time | Blow Counts (per 6 inches) | PID/LEL (ppm/%) | Geologic Description | Soil Class | Graphic Log | DEPTH (feet) | Well Diagram |
|---|---|---|---|---|---|---|---|---|---|---|
| 5 | | | | | | **AIRKNIFED TO 7 FEET** | | | 5 | well box encased in concrete |
| | | | | | | **Clayey SILT** - very dark grayish brown [2 5Y 3/2], very stiff moist; trace fine- to medium-grained sand; trace fine gravel. | ml | | | |
| 10 | | W-9d10 | 0957 | 10/13/17 | 0 0 | | | | 10 | |
| 15 | | W-9d15 | 1005 | 15/15/19 | 0.0 | **Sandy SILT** - dark brown [7 5YR 3/3], hard moist; fine- to medium-grained sand | ml | | 15 | |
| 20 | | W-9d20 | 1014 | 19/20/21 | 0.0 | **Clayey Sandy SILT** - dark brown [7.5YR 3/3] hard moist; fine- to medium-grained sand | ml | | 20 | |
| 25 | | W-9d25 | 1021 | 15/16/24 | 0.0 | **Clayey SILT** - dark brown [ 10YR 3/3], hard moist; trace fine- to medium-grained sand | ml | | 25 | |
| 30 | | W-9d30 | 1028 | 17/17/20 | 0 0 | **Silty SAND** - fine- to medium-grained dark brown [7.5YR 3/4], dense, moist.<br>**SILT with Clay** - dark brown [10YR 3/3], hard, moist; trace fine- to medium-grained sand | sm<br>ml | | 30 | |
| 35 | | W-9d35 | 1038 | 15/16/20 | 0 0 | | | | 35 | |
| 40 | | W-9d40 | 1054 | 18/23/28 | 0.0 | **Clayey SILT** - dark brown [7 5YR 3/3] hard, moist; trace fine- to medium-grained sand; trace amount of fine gravel.<br>**Sandy SILT** - very dark brown [10YR 2/2] hard, moist; fine- to medium-grained sand | ml<br>ml | | 40 | blank 4 inch dia. SCH 80 PVC from 0-160 feet |
| 45 | | W-9d45 | 1105 | 19/20/20 | 3.1 | **Silty SAND** - fine- to medium-grained, very dark brown [10YR 2/2], dense moist | sm | | 45 | |
| 50 | | W-9d50 | 1110 | 17/20/23 | 17.9 | | ml | | 50 | |





Remarks/Notes: 1) PID Used:

**WAYNE PERRY, INC.**
8281 Commonwealth Avenue
Buena Park, California 90621
(714) 826-0352
www.wpinc.com

# Log of Boring/Well W-9

PROJECT: *Sawyer Petroleum*

PROJECT NO.: *06.202*

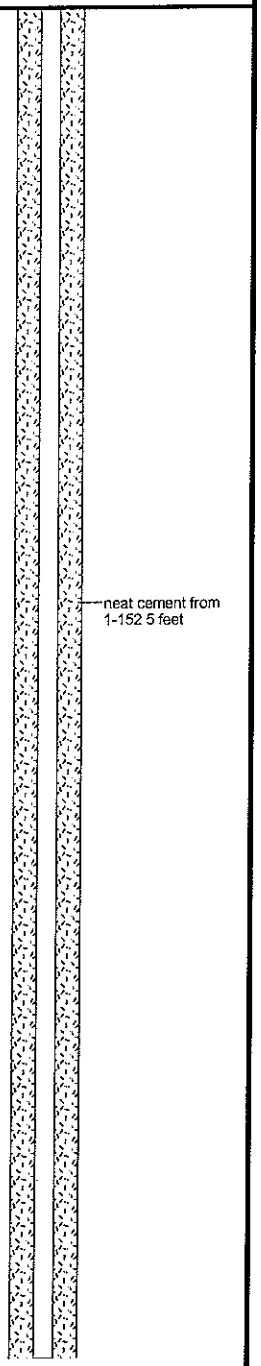
LOCATION: *14117 AETNA ST., VAN NUYS, CA*

DATE BEGAN: *9/18/06* FINISHED: *9/29/06*

This log is a representation of subsurface conditions at the time and place of drilling. With the passage of time or at any other location there may be consequential changes in conditions

| DEPTH (feet) | Sample ID | Time | Blow Counts (per 6 inches) | PID/LEL (ppm/%) | Geologic Description | Soil Class |
|---|---|---|---|---|---|---|
| 55 | | | | | **Clayey SILT with Sand** - black [10YR 2/1] hard moist; fine- to medium-grained sand | |
| | W-9d55 | 1121 | 21/21/25 | 12.8 | **Silty SAND** - fine- to coarse-grained, dark yellowish brown [10YR 3/6], dense moist | sm |
| 60 | W-9d60 | 1128 | 15/15/19 | 4.7 | **Sandy SILT** - dark olive brown [2.5Y 5/3] hard moist; fine- to medium-grained sand. | ml |
| 65 | W-9d65 | 1136 | 20/21/25 | 16.1 | **Silty SAND** - fine- to medium-grained dark brown [10YR 3/3] dense, moist; trace amount of fine gravel | sm |
| 70 | W-9d70 | 1245 | 15/25/50 | 53.6 | **Sandy SILT with Clay** - dark brown [10YR 3/3] hard, moist; fine- to medium-grained. | ml |
| | | | | | **Silty SAND** - fine- to medium-grained, dark yellowish brown [10YR 3/6] very dense, moist; trace amount of fine gravel. | sm |
| 75 | W-9d75 | 1256 | 52 | 0.1 | **Silty SAND with Gravel** - fine- to coarse-grained, dark olive brown [2.5Y 3/3] very dense moist; fine and coarse gravel | sm |
| 80 | W-9d80 | 1305 | 12/30/30 | 94.7 | **Silty SAND** - fine- to medium-grained, dark olive brown [2.5Y 3/3], very dense moist; trace amount of fine gravel;<br>trace clay. | sm |
| 85 | W-9d85 | 1319 | 13/15/18 | 95.3 | **SAND** - fine- to coarse-grained, olive gray [5Y 4/2] dense. moist; trace fine and coarse gravel | sp |
| 90 | W-9d90 | 1334 | 13/16/19 | 26.0 | **Silty SAND** - fine- to medium-grained, light olive brown [2.5y 5/4], dense. moist; trace amount of fine gravel. | sm |
| | | | | | **Clayey SILT** - olive brown [2.5Y 4/4], hard moist; trace fine- to medium-grained sand. | ml |
| 95 | W-9d95 | 1352 | 16/18/21 | 7.8 | **Silty SAND** - fine- to medium-grained, dark olive brown [2.5Y 3/3], dense, moist; trace amount of coarse gravel | sm |
| 100 | W-9d100 | 1403 | 15/13/15 | 1.9 | **Sandy SILT** - dark olive brown [2.5Y 3/3], very stiff. moist; fine- to medium-grained sand. | ml |
| 105 | W-9d105 | 1420 | 15/16/23 | 0.5 | **Clayey SILT with Sand** - dark brown [7.5YR 3/2] hard, moist; fine- to medium-grained. | ml |
| | | | | | **Sandy SILT** - dark brown [10YR 3/3] hard, moist; fine- to medium-grained sand. | ml |
| 110 | W-9d110 | 1425 | 19/23/23 | 38.6 | **Clayey Silty SAND** - fine- to medium-grained dark olive brown [2.5Y 3/3], dense moist | ml |

Well Diagram



Remarks/Notes: 1) PID Used:

**WAYNE PERRY, INC.**
8281 Commonwealth Avenue
Buena Park, California 90621
(714) 826-0352
www.wpinc.com

# Log of Boring/Well W-9

PROJECT: *Sawyer Petroleum*

PROJECT NO : *06 202*

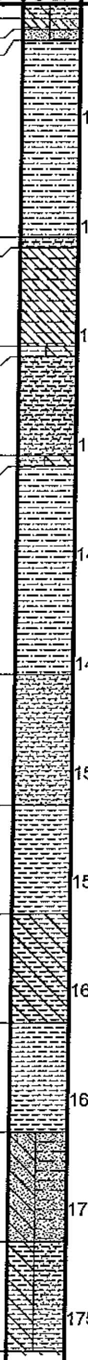
LOCATION: *14117 AETNA ST., VAN NUYS, CA*

DATE BEGAN: *9/18/06* FINISHED: *9/29/06*

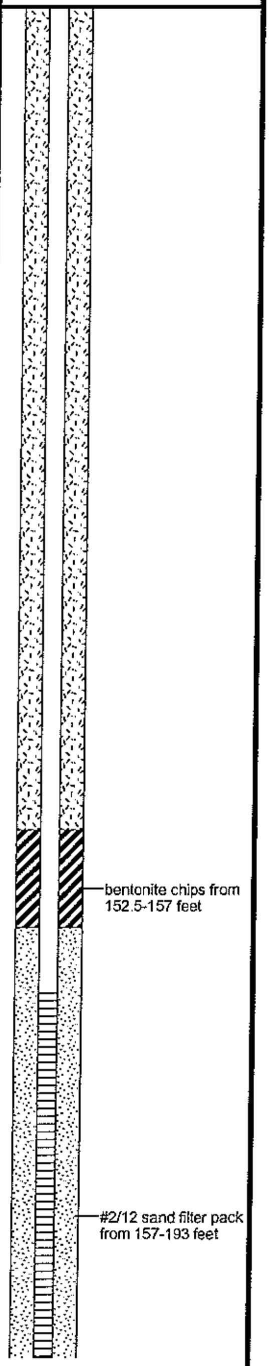
This log is a representation of subsurface conditions at the time and place of drilling. With the passage of time or at any other location, there may be consequential changes in conditions.

| DEPTH (feet) | Sample I D | Time | Blow Counts (per 6 inches) | PID/LEL (ppm/%) | Geologic Description | Soil Class |
|---|---|---|---|---|---|---|
| | W-9d115 | 1500 | 14/16/20 | 11.1 | **SILT with Clay and Sand** - dark brown [10YR 3/3], hard, moist; fine- to medium-grained sand.<br>**SAND with Silt** - fine- to medium-grained, gray [5Y 3/1], dense, moist.<br>**Silty SAND** - fine- to medium-grained dark gray [2 5Y 4/1] dense, moist | ml<br>sp<br>sm |
| 120 | W-9d120 | 1508 | 38/50 | 2 5 | dark olive brown [2 5Y 3/3] very dense. | |
| 125 | W-9d125 | 1518 | 23/25/30 | 5 1 | **Sandy SILT** - dark olive brown [2 5Y 3/3] hard moist.<br>**Silty CLAY** - dark brown [10YR 3/3] hard moist; trace fine- to medium-grained sand | ml<br>cl |
| 130 | W-9d130 | 1540 | 20/23/25 | 1.5 | **SILT with Clay** - very dark grayish brown [10YR 3/2], hard moist; trace fine- to medium-grained sand.<br>**Sandy SILT** - very dark grayish brown [2 5Y 3/2] hard, moist; fine- to medium-grained sand. | ml<br>ml |
| 135 | W-9d135 | 0841 | 35/50 | 40.2 | **Sandy SILT with Clay** - dark brown [10YR 3/3] hard, moist; fine- to medium-grained sand.<br>**Silty SAND** - fine- to medium-grained dark brown [10YR 3/3], very dense, moist;<br>no recovery sample at 140 feet | ml<br>sm |
| 145 | W-9d145 | 0927 | 51 | 73 9 | **Sandy SILT** - dark olive brown [2 5Y 3/3], hard, moist; fine- to medium-grained sand | ml |
| 150 | W-9d150 | 0953 | 20/20/25 | 0.0 | **SILT** - very dark grayish brown [2 5Y 3/2], hard, moist; trace fine- to medium-grained sand; trace clay | ml |
| 155 | W-9d155 | 1009 | 15/19/23 | 0.5 | **Clayey SILT** - dark olive brown [2 5Y 3/3] hard moist; trace fine- to medium-grained sand. | ml |
| 160 | W-9d160 | 1021 | 10/12/13 | 0.1 | **SILT** - very dark grayish brown [2 5Y 3/2], very stiff, moist; trace fine- to medium-grained sand; trace amount of fine gravel | ml |
| 165 | W-9d165 | 1047 | 20/29/20 | 0.7 | **Clayey Sandy SILT** - very dark grayish brown [2.5Y 3/2] hard moist; fine- to medium-grained | ml |
| ∇ 170 | W-9d170 | 1106 | 13/15/20 | 0.0 | **Clayey SILT with Sand** - dark olive brown [2.5Y 3/3], hard, saturated; fine- to medium-grained sand | ml |
| 175 | | | | | | |

Graphic Log



Well Diagram



Remarks/Notes: 1) PID Used:

**WAYNE PERRY, INC.**
8281 Commonwealth Avenue
Buena Park, California 90621
(714) 826-0352
www.wpinc.com

# Log of Boring/Well W-9

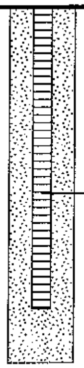
PROJECT: *Sawyer Petroleum*

PROJECT NO.: *06 202*

LOCATION: *14117 AETNA ST., VAN NUYS, CA*

DATE BEGAN: *9/18/06* FINISHED: *9/29/06*

This log is a representation of subsurface conditions at the time and place of drilling. With the passage of time or at any other location, there may be consequential changes in conditions

| DEPTH (feet) | Samples | Sample ID | Time | Blow Counts (per 6 inches) | PID/LEL (ppm/%) | Geologic Description | Soil Class | Graphic Log | DEPTH (feet) | Well Diagram |
|---|---|---|---|---|---|---|---|---|---|---|
| | | W-9d175 | 1124 | 20/23/25 | 0.1 | **Clayey SILT** - dark olive brown [2 5Y 3/3], hard saturated; trace fine- to medium-grained sand | ml | | |  |
| 180 | | W-9d180 | 1134 | 11/13/15 | 0.0 | **Silty SAND** - fine- to medium-grained, dark yellowish brown [10YR 3/6] dense moist | sm | | 180 | |
| 185 | | W-9d185 | 1146 | 17/19/23 | 135 | **Clayey SILT** - brown [10YR 4/3], hard moist; trace fine- to medium-grained sand | ml | | 185 | screened (0.02 inch slot) 4 inch dia SCH 80 PVC from 160-190 5 feet |
| 190 | | W-9d190 | 1154 | 15/19/24 | 137 | **Sandy SILT** - dark olive brown [2 5Y 3/3] hard moist. | ml | | 190 | |
| | | | | | | Bottom at 193 feet | | | | |
| 195 | | | | | | | | | 195 | |
| 200 | | | | | | | | | 200 | |
| 205 | | | | | | | | | 205 | |
| 210 | | | | | | | | | 210 | |
| 215 | | | | | | | | | 215 | |
| 220 | | | | | | | | | 220 | |
| 225 | | | | | | | | | 225 | |
| 230 | | | | | | | | | 230 | |
| 235 | | | | | | | | | 235 | |

Remarks/Notes: 1) PID Used:

**WAYNE PERRY, INC.**
8281 Commonwealth Avenue
Buena Park, California 90621
(714) 826-0352
www.wpinc.com

# Log of Boring/Well W-10

PROJECT: *Sawyer Petroleum*

SURFACE ELEVATION: *Not Measured*

LOCATION: *14117 AETNA ST., VAN NUYS, CA*

TOTAL DEPTH: *191 5 feet*

BORING DIAMETER: *10 inches*

PROJECT NO.: *06.202*

DEPTH TO FIRST SATURATION: *172.5 feet*

DATE BEGAN: *9/29/06* FINISHED: *10/4/06*

TOP OF WELL CASING ELEVATION: *N/A*

DRILLING COMPANY: *Water Development Corporation*

STATIC GW ELEVATION: DATE: *N/A*

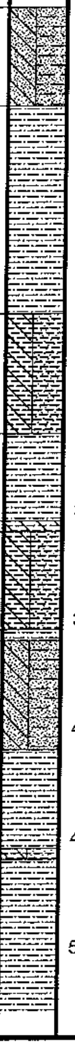
DRILLING METHOD: *Hollow-Stem Auger*

LOGGED BY: *E. Kuhn* CHECKED BY: *D. Henry*

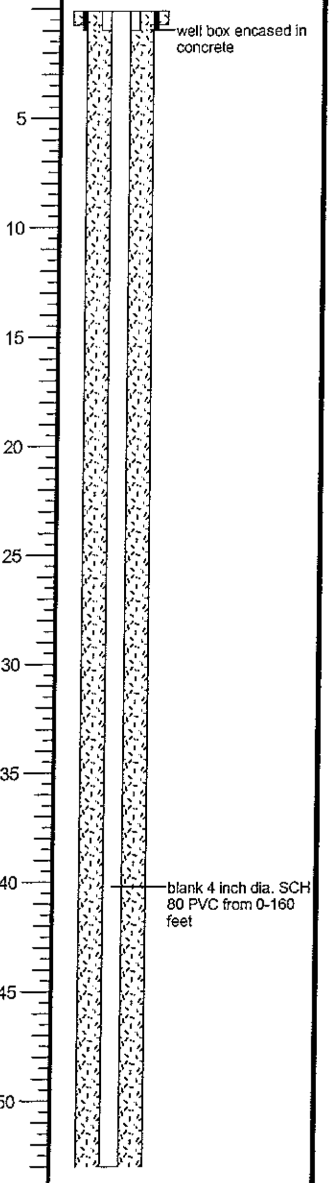
This log is a representation of subsurface conditions at the time and place of drilling. With the passage of time or at any other location, there may be consequential changes in conditions

| DEPTH (feet) | Samples | Sample I.D | Time | Blow Counts (per 6 inches) | PID/LEL (ppm/%) | Geologic Description | Soil Class |
|---|---|---|---|---|---|---|---|
| | | | | | | **AIRKNIFED TO 7 FEET** | |
| 5 | | | | | | | |
| | | | | | | **Clayey Sandy SILT** - dark yellowish brown [10YR 3/4], very stiff, moist; fine- to medium-grained sand; trace amount of fine gravel | ml |
| 10 | ⊠ | W-10d10 | 0927 | 7/7/10 | 0.0 | **Silty SAND** - fine- to medium-grained dark brown [10YR 3/3], dense moist; trace amount of fine gravel | sm |
| 15 | ⊠ | W-10d15 | 0936 | 9/15/15 | 0 0 | | |
| 20 | | | | | | dark yellowish brown [10YR 3/4]. | |
| | ⊠ | W-10d20 | 0944 | 19/20/22 | 0.0 | **Clayey Silty SAND** - fine- to medium-grained dark brown [10YR 3/3], dense. moist. | sm |
| 25 | ⊠ | W-10d25 | 0951 | 20/18/20 | 0.0 | **Silty SAND** - fine- to medium-grained, dark yellowish brown [10YR 3/4] dense. moist | sm |
| 30 | ⊠ | W-10d30 | 0958 | 17/18/19 | 0 2 | **Clayey SILT** - very dark grayish brown [10YR 3/2], hard moist; trace fine- medium-grained sand; | ml |
| | | | | | | **Clayey Silty SAND** - fine- to medium-grained dark brown [10YR 3/3] dense moist; trace amount of fine gravel. | sm |
| 35 | ⊠ | W-10d35 | 1008 | 13/15/15 | 0 0 | **Silty SAND** - fine- to medium-grained, dark brown [7 5YR 3/4], dense. moist; trace amount of fine gravel. | ml |
| | | | | | | | ml |
| 40 | ⊠ | W-10d40 | 1018 | 13/16/18 | 0.0 | **Clayey Sandy SILT** - dark brown [10YR 3/3], very stiff, moist; fine- to medium-grained; trace amount of fine gravel. | ml |
| | | | | | | **Silty SAND** - fine- to medium-grained, dark yellowish brown [10YR 3/4] dense. moist; trace amount of fine gravel. | |
| 45 | ⊠ | W-10d45 | 1028 | 13/15/15 | 0.0 | **Clayey Silty SAND** - fine- to coarse-grained. dark brown [10YR 3/3], dense, moist. | sm |
| | | | | | | **Silty SAND** - fine- to medium-grained. dark olive brown [2.5Y 3/3], dense, moist; | sm |
| 50 | ⊠ | W-10d50 | 1055 | 21/28/35 | 35.8 | dark yellowish brown [10YR 3/6], very dense trace amount of fine and coarse gravel; | |

Graphic Log



Well Diagram



Remarks/Notes: 1) PID Used:

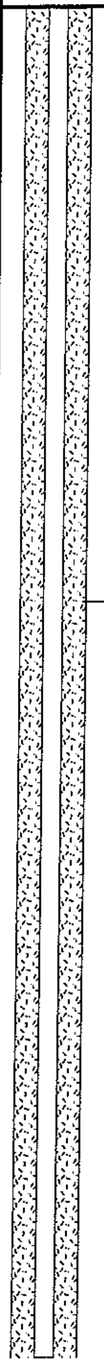
**WAYNE PERRY, INC.**
8281 Commonwealth Avenue
Buena Park, California 90621
(714) 826-0352
www.wpinc.com

# Log of Boring/Well W-10

PROJECT: *Sawyer Petroleum*
PROJECT NO : *06 202*
LOCATION: *14117 AETNA ST., VAN NUYS, CA*
DATE BEGAN: *9/29/06* FINISHED: *10/4/06*

This log is a representation of subsurface conditions at the time and place of drilling. With the passage of time or at any other location, there may be consequential changes in conditions.

| DEPTH (feet) | Samples | Sample I D | Time | Blow Counts (per 6 inches) | PID/LEL (ppm/%) | Geologic Description | Soil Class | Graphic Log | DEPTH (feet) | Well Diagram |
|---|---|---|---|---|---|---|---|---|---|---|
| 55 | | | | | | dark olive brown [2.5Y 3/3]. | | | 55 | |
| | | W-10d55 | 1108 | 20/25/20 | 18.5 | **Clayey SILT** - dark olive brown [2 5Y 3/3] hard. moist; trace fine- to medium-grained sand | ml | | | |
| 60 | | W-10d60 | 1115 | 15/15/30 | 2.1 | **Silty SAND** - fine- to medium-grained dark olive brown [2.5Y 3/3], dense, moist.<br>**Sandy SILT with Clay** - dark brown [10YR 3/3] hard moist; fine- to medium-grained sand. | sm<br>ml | | 60 | |
| 65 | | W-10d65 | 1336 | 15/15/30 | 3.5 | **Silty SAND with Gravel** - fine- to coarse-grained dark olive brown [2 5Y 3/3] dense moist; | sm | | 65 | |
| 70 | | W-10d70 | 1352 | 23/25/27 | 21 7 | | | | 70 | |
| 75 | | | | | | no recovered sample at 75 feet | | | 75 | |
| 80 | | W-10d80 | 1401 | 18/20/20 | 10.4 | **Clayey Silty SAND** - fine- to medium-grained, dark olive brown [2 5Y 3/3] dense. moist; trace amount of fine gravel. | sm | | 80 | neat cement from 1-151 feet |
| 85 | | W-10d85 | 1411 | 15/18/23 | 7.1 | **Silty SAND** - fine- to medium-grained, dark grayish brown [10YR 4/2] dense. moist; trace clay; | sm | | 85 | |
| 90 | | W-10d90 | 1421 | 19/20/20 | 10 7 | **SAND** - fine- to medium-grained, grayish brown [10YR 5/2], dense, moist.<br>**Clayey SILT** - olive brown [2 5Y 4/3], hard moist; trace amount of fine gravel | sp<br>ml | | 90 | |
| 95 | | W-10d95 | 1438 | 16/19/23 | 21.7 | **Clayey Silty SAND** - fine- to medium-grained, dark olive brown [2.5Y 3/3], dense, moist; trace amount of fine gravel.<br>**Silty SAND** - fine- to medium-grained olive brown [2.5Y 4/4], dense, moist | ml<br>sm | | 95 | |
| 100 | | W-10d100 | 1454 | 20/20/23 | 4.4 | **Clayey SILT with Sand** - dark olive brown [2.5Y 3/3], hard. moist; fine - to medium-grained sand; trace amount of fine gravel | ml | | 100 | |
| 105 | | W-10d105 | 1510 | 19/23/27 | 9.7 | **SAND** - trace amount of fine gravel.<br>**Clayey SILT** - dark olive brown [2 5Y 3/3], hard, moist; trace fine- to medium-grained; trace amount of fine gravel. | sp<br>ml<br>sm | | 105 | |
| 110 | | W-10d110 | 1524 | 25/27/32 | 28.3 | **Silty SAND** - fine- to medium-grained, olive brown [2.5Y 4/4] dense. moist; trace amount of fine gravel. | ml<br>sm<br>ml | | 110 | |



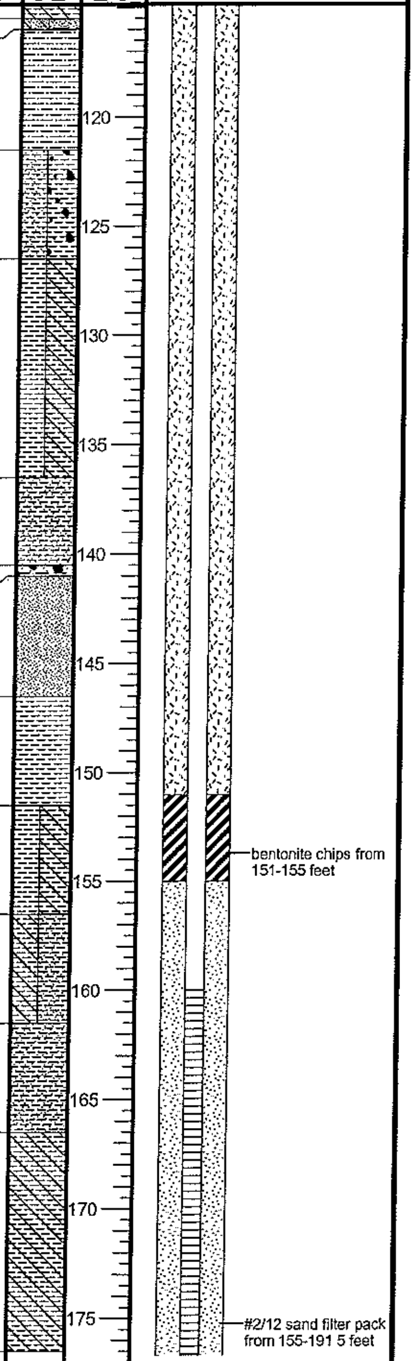
Remarks/Notes: 1) PID Used:

# Log of Boring/Well W-10

PROJECT: *Sawyer Petroleum*
PROJECT NO.: *06 202*
LOCATION: *14117 AETNA ST., VAN NUYS, CA*
DATE BEGAN: *9/29/06* FINISHED: *10/4/06*

This log is a representation of subsurface conditions at the time and place of drilling. With the passage of time or at any other location, there may be consequential changes in conditions.

| DEPTH (feet) | Samples | Sample I.D. | Time | Blow Counts (per 6 inches) | PID/LEL (ppm/%) | Geologic Description | Soil Class | Graphic Log | DEPTH (feet) | Well Diagram |
|---|---|---|---|---|---|---|---|---|---|---|
| | | W-10d115 | 0818 | 21/15 | 19 7 | **Clayey SILT** - very dark grayish brown [2 5Y 3/2] hard, moist; trace fine- to medium-grained sand.<br>**Silty SAND** - fine- to coarse-grained dark olive brown [2.5Y 3/3], very dense, moist.<br>**Clayey SILT** - very dark grayish brown [2 5Y 3/2] hard, moist; trace fine- to medium-grained sand. | ml<br>sm | | | |
| 120 | | W-10d120 | 0832 | 19/20/23 | 21.5 | **Clayey Sandy SILT** - dark olive brown [2 5Y 3/3] hard, moist; fine- to medium-grained sand; trace amount of fine gravel.<br>**Silty SAND** - fine- to coarse-grained, dark yellowish brown [10YR 4/6] dense moist; trace amount of fine gravel. | sp | | 120 | |
| 125 | | W-10d125 | 0844 | 20/23/20 | 2.6 | **SAND with Silt and gravel** - fine- to coarse-grained, olive brown [2 5Y 4/4] dense moist; fine gravel.<br>**SILT with Clay** - dark olive brown [2 5Y 3/3], hard, moist; trace fine- to medium-grained sand; trace amount of fine gravel; no recovered sample at 130 feet | ml | | 125 | |
| 130 | | | | | | | | | 130 | |
| 135 | | W-10d135 | 1408 | 20/20/25 | 5.3 | **Sandy SILT** - dark brown [10YR 3/3] hard moist; fine- to medium-grained sand; trace amount of fine gravel; trace clay | ml | | 135 | |
| 140 | | W-10d140 | 1431 | 52 | 4.1 | **Silty SAND with Gravel** - fine- to coarse-grained, dark olive brown [2 5Y 3/3] very dense, moist; fine and coarse gravel.<br>**SAND** - fine- to coarse-grained, light brownish gray [2.5Y 6/2], very dense moist; trace silt; trace amount of fine gravel. | sm<br>sp | | 140 | |
| 145 | | W-10d145 | 1449 | 25/27/31 | 6.5 | **SILT** - dark olive brown [2 5Y 3/3], hard moist; trace fine- to medium-grained sand | ml | | 145 | |
| 150 | | W-10d150 | 1512 | 25/28/30 | 2.8 | **SILT with Clay** - dark olive brown [2 5Y 3/3] very dense moist; trace fine- to medium-grained | ml | | 150 | |
| 155 | | W-10d155 | 0812 | 20/25/30 | 1.6 | **Clayey Silty SAND** - fine- to medium-grained, very dark grayish brown [2.5Y 3/2], hard, moist | sm | | 155 | |
| 160 | | W-10d160 | 0835 | 20/19/27 | 2.9 | **Sandy SILT** - dark olive brown [2 5Y 3/3], hard moist; fine to medium-grained sand; trace clay | ml | | 160 | |
| 165 | | W-10d165 | 0855 | 20/26/28 | 0.3 | **Clayey SILT** - dark olive brown [2.5Y 3/3] hard moist; | ml | | 165 | |
| 170<br>∇ | | W-10d170 | 0907 | 20/23/26 | 0 5 | very moist trace amount of fine gravel; | | | 170 | |
| 175 | | | | | | trace fine- to medium-grained sand | | | 175 | |



Remarks/Notes: 1) PID Used:

**WAYNE PERRY, INC.**
8281 Commonwealth Avenue
Buena Park, California 90621
(714) 826-0352
www.wpinc.com

# Log of Boring/Well W-10

PROJECT: *Sawyer Petroleum*

PROJECT NO.: *06.202*

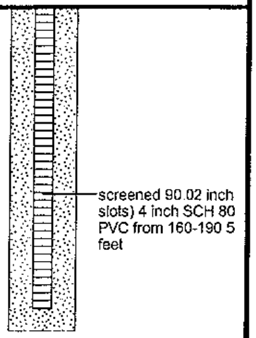
LOCATION: *14117 AETNA ST., VAN NUYS, CA*

DATE BEGAN: *9/29/06* FINISHED: *10/4/06*

This log is a representation of subsurface conditions at the time and place of drilling. With the passage of time or at any other location, there may be consequential changes in conditions.

| DEPTH (feet) | Samples | Sample I D | Time | Blow Counts (per 6 inches) | PID/LEL (ppm/%) | Geologic Description | Soil Class | Graphic Log | DEPTH (feet) |
|---|---|---|---|---|---|---|---|---|---|
| | | W-10d175 | 0921 | 23/26/27 | 0.2 | **SILT** - dark olive brown [2 5Y 3/3]. hard. moist; trace clay | ml | | |
| 180 | ☒ | W-10d180 | 1013 | 25/25/30 | 0.0 | | | | 180 |
| | | | | | | **SILT with Clay** - dark olive brown [2 5Y 3/3] hard moist | ml | | |
| 185 | ☒ | W-10d185 | 1038 | 20/23/31 | 0.0 | | | | 185 |
| | | | | | | **Sandy SILT** - dark brown [10YR 3/3] very hard. moist; fine- to medium-grained sand; trace clay; trace amount of fine gravel. | ml | | |
| 190 | ☒ | W-10d190 | 1058 | 23/25/30 | 0.0 | | | | 190 |
| | | | | | | Bottom at 191 5 feet. | | | |
| 195 | | | | | | | | | 195 |
| 200 | | | | | | | | | 200 |
| 205 | | | | | | | | | 205 |
| 210 | | | | | | | | | 210 |
| 215 | | | | | | | | | 215 |
| 220 | | | | | | | | | 220 |
| 225 | | | | | | | | | 225 |
| 230 | | | | | | | | | 230 |
| 235 | | | | | | | | | 235 |

Well Diagram



Remarks/Notes: 1) PID Used:

**WAYNE PERRY, INC.**
**8281 Commonwealth Avenue**
**Buena Park, California 90621**
**(714) 826-0352**
**www.wpinc.com**

# Log of Boring/Well SVE-4

PROJECT: *Sawyer Petroleum*

SURFACE ELEVATION: *Not Measured*

LOCATION: *14117 AETNA ST. VAN NUYS. CA*

TOTAL DEPTH: *155 feet*

BORING DIAMETER: *8/12*

PROJECT NO.: *06 202*

DEPTH TO FIRST SATURATION: *N/A*

DATE BEGAN: *8/8/07* FINISHED: *8/8/07*

TOP OF WELL CASING ELEVATION: *N/A*

DRILLING COMPANY: *Test America*

STATIC GW ELEVATION: DATE: *N/A*

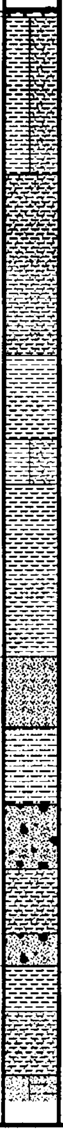
DRILLING METHOD: *Hollow-Stem Auger*

LOGGED BY: *A. Dollemore* CHECKED BY: *D. Henry*

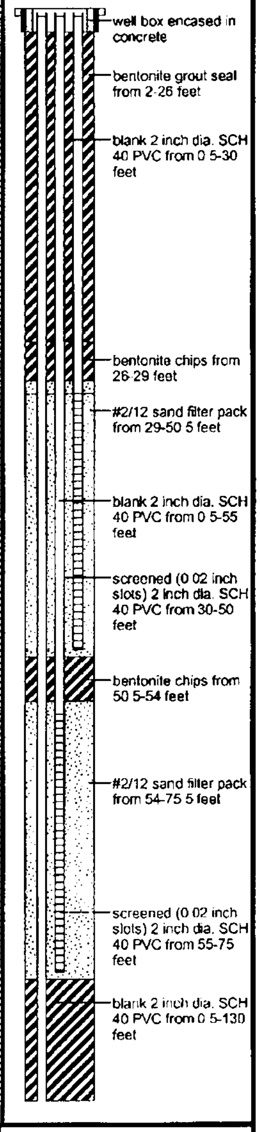
This log is a representation of subsurface conditions at the time and place of drilling. With the passage of time or at any other location, there may be consequential changes in conditions

| DEPTH (feet) | Samples | Sample I D | Time | Blow Counts (per 6 inches) | PID/LEL (ppm/%) | Geologic Description | Soil Class |
|---|---|---|---|---|---|---|---|
| | | | | | | **ASPHALT**, 4 inches. | |
| | | | | | | **AGGREGATE BASE**, 4 inches. | ml |
| 5 | | | | | | **SILT with Sand** - very dark gray [5Y 3/1] stiff moist; with fine-grained sand; | |
| 10 | | SVE-4d10 | 1330 | 7/8/10 | 1.8 | color change at 10 feet to very dark greenish gray [4/10Y]. | |
| 15 | | SVE-4d15 | 1337 | 8/11/13 | 2 8 | **Sandy SILT** - dark greenish gray [4/5GY] very stiff moist; with fine-grained sand; | ml |
| 20 | | SVE-4d20 | 1346 | 9/11/14 | 0 0 | | |
| 25 | | SVE-4d25 | 1353 | 8/9/12 | 0 0 | color change at 25 feet to brown [10YR 5/3] | |
| | | | | | | **SILT** - greenish gray [5/10Y] very stiff moist | ml |
| 30 | | SVE-4d30 | 1402 | 7/10/12 | 0 0 | | |
| 35 | | SVE-4d35 | 1411 | 11/13/14 | 0.0 | **SILT with Sand** - olive [5Y 4/3] very stiff moist; with fine-grained sand. | ml |
| | | | | | | **SILT** - greenish gray [5/10Y]. very stiff. moist; odor; | ml |
| 40 | | SVE-4d40 | 1420 | 10/12/16 | 11 1 | | |
| 45 | | SVE-4d45 | 1423 | 13/14/18 | 13 0 | color change at 45 feet to olive gray [5Y 4/2]; | |
| 50 | | SVE-4d50 | 1438 | 12/12/17 | 31 5 | color change at 50 feet to olive [5Y 5/4] | |
| | | | | | | **SAND** - fine- to medium-grained, light olive brown [2 5Y 5/4] dense moist; solvent odor | sp |
| 55 | | SVE-4d55 | 1445 | 13/15/18 | 89 7 | | |
| | | | | | | **Silty SAND** - fine-grained, light olive brown [2 5Y 5/4] dense moist; solvent odor | sm |
| 60 | | SVE-4d60 | 1153 | 14/14/18 | 181.3 | | |
| | | | | | | **Gravelly SAND** - fine- to coarse-grained, with fine and coarse gravel, light brownish gray [2 5Y 6/2], dense, moist; strong solvent odor; no Encore | sp |
| 65 | | SVE-4d65 | 1500 | 15/16/20 | 987.0 | | |
| | | | | | | **Sandy SILT** - light olive brown [5Y 5/4]. hard moist; with fine-grained sand; solvent odor | ml |
| 70 | | SVE-4d70 | 1508 | 12/14/20 | 203.0 | | |
| | | | | | | **Gravelly SAND** - fine- to coarse-grained, with fine and coarse gravel, grayish brown [2 5Y 5/2] dense, moist; solvent odor. | sp |
| 75 | | SVE-4d75 | 1518 | 17/20/22 | 181 0 | | ml |
| | | | | | | **SILT** - light yellowish brown [2 5Y 6/4] hard moist; solvent odor | ml |
| 80 | | SVE-4d80 | 1530 | 15/19/21 | 37 7 | **Sandy SILT** - light olive brown [2 5Y 5/6] hard moist; with fine-grained sand. | |
| 85 | | | | | | | sp |

Graphic Log



Well Diagram



Remarks/Notes: 1) PID Used:

**WAYNE PERRY, INC.**
8281 Commonwealth Avenue
Buena Park, California 90621
(714) 826-0352
www.wpinc.com

# Log of Boring/Well SVE-4

PROJECT: *Sawyer Petroleum*

PROJECT NO : *06 202*

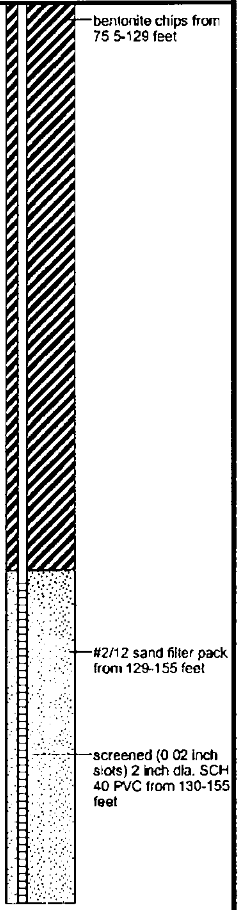
LOCATION: *14117 AETNA ST., VAN NUYS, CA*

DATE BEGAN: *8/8/07* FINISHED: *8/8/07*

This log is a representation of subsurface conditions at the time and place of drilling. With the passage of time or at any other location there may be consequential changes in conditions

| DEPTH (feet) | Samples | Sample I D | Time | Blow Counts (per 6 inches) | PID/LEL (ppm/%) | Geologic Description | Soil Class |
|---|---|---|---|---|---|---|---|
| | | SVE-4d85 | 1537 | 16/17/24 | 41.8 | **SAND with Silt** - fine-grained olive [5Y 5/3] dense moist; solvent odor | |
| 90 | | SVE-4d90 | 1546 | 15/18/25 | 28 9 | **SAND** - fine-grained light gray [5Y 7/1] dense moist; solvent odor; | sp |
| 95 | | SVE-4d95 | 1555 | 18/19/28 | 9 7 | with some silt at 95 feet | |
| 100 | | SVE-4d100 | 1603 | 15/18/20 | 10 3 | **Silty SAND** - fine-grained, olive gray [5Y 4/2] dense moist; solvent odor | sm |
| 105 | | SVE-4d105 | 1612 | 15/20/25 | 2 8 | **Sandy SILT** - dark yellowish brown [10YR 4/4] hard, moist; with fine- to coarse-grained sand | ml |
| | | | | | | **SILT with Clay** - olive [5Y 5/3] hard moist; | ml |
| 110 | | SVE-4d110 | 1620 | 14/20/20 | 0 7 | | |
| 115 | | SVE-4d115 | 1629 | 21/20/23 | 0 0 | color change at 115 feet to light olive brown [2 5Y 5/4] trace fine-grained sand; | |
| 120 | | SVE-4d120 | 1637 | 13/17/20 | | no recovery at 120 feet | |
| 125 | | SVE-4d125 | 1647 | 12/16/19 | 1 7 | **SILT** - olive [5Y 4/4] hard moist; | ml |
| 130 | | SVE-4d130 | 1700 | 15/16/20 | 2 1 | iron oxide mottling at 130 feet | |
| 135 | | SVE-4d135 | 1708 | 13/16/23 | 0 0 | **Sandy SILT** - olive [5Y 4/4], hard moist; with fine- to medium-grained sand | ml |
| 140 | | SVE-4d140 | 1715 | 11/12/17 | 0 8 | **SAND with Gravel** - fine- to coarse-grained pale olive [5Y 6/3], medium dense moist; with fine and coarse gravel. | sp |
| 145 | | SVE-4d145 | 1723 | 14/15/16 | 3 7 | **SILT** - olive [5Y 5/3] hard moist: trace fine-grained sand | ml |
| 150 | | SVE-4d150 | 1731 | 15/17/20 | 2 8 | | |
| 155 | | SVE-4d155 | 1740 | 14/15/15 | 3 1 | Bottom at 155 feet | |
| 160 | | | | | | | |
| 165 | | | | | | | |
| 170 | | | | | | | |
| 175 | | | | | | | |
| 180 | | | | | | | |

Well Diagram



Remarks/Notes: 1) PID Used:

# APPENDIX H

## Geotracker Data and EDR Report Review Memo

**MUGENKIOKU CORPORATION**

**TO:** Curtis Fang

**FROM:** Matt Grooms

**SUBJECT:** Metro TO5 - Hazard and Hazardous Waste Research Task

**DATE:** October 8, 2020

---

MugenKioku was tasked with reviewing GeoTracker data to determine if there were active GeoTracker sites near the proposed drywell locations or within the project drainage area. MugenKioku was also tasked with reviewing EDR reports to determine if additional pollutant sources not mentioned within GeoTracker could potentially affect the proposed drywell locations or project drainage area.

Based on analysis of GeoTracker data, there are two active GeoTracker sites near proposed drywell locations and zero active GeoTracker sites within the project drainage areas. Table 1 contains a summary of each of the two active GeoTracker sites. Table 2 compares the most recent groundwater sampling results for both GeoTracker ID SL1842891411 and GeoTracker ID T0603702406 to the California's maximum contaminant levels (MCLs) for drinking water. Figure 1 contains a map of the drainage areas, proposed drywell locations, and active GeoTracker sites.

The following provides a brief summary of each of the three active GeoTracker sites. Additional information can be found within Table 1.

- GeoTracker ID SL184281411 is located approximately 0.22 miles southeast of MOL-1, and the potential contaminants of concern are volatile organic compounds (VOCs). Attachment A contains the Groundwater and Soil Vapor Extraction System Operation, Maintenance, and Monitoring Report, prepared by Geosyntec during the second quarter of 2020. This report provides the most recent sampling results and groundwater data.

- GeoTracker ID T0603702406 is located approximately 0.10 miles west of MOL-4, and the potential contaminants of concern are "Other Solvent/Non-Petroleum Hydrocarbons". Attachment B contains the Groundwater Monitoring, and Status Report, prepared by Wayne Perry during the second quarter of 2020. This attachment provides the most recent sampling and groundwater data.

After reviewing the EDR reports is was determined that no additional active contaminant remediation sites and potential groundwater pollutants were found near the proposed drywell locations or project drainage area. The EDR Reports are included within Attachment C and Attachment D.

Due to file upload size limit, Attachment A through D are not attached as part of the safe clean water program application. These attachments can be provided as electronic copies upon request.

## TABLE 1. SUMMARY OF ACTIVE SITES

| GeoTracker ID | Address | Status | Potential Contaminants of Concern | Distance from Drywell Location | Located within Drainage Area | Depth to Groundwater | Groundwater Flow Direction |
|---|---|---|---|---|---|---|---|
| SL184281411 | 14837 Califa St. Van Nuys, CA 91411 | Open - Remediation as of 5/20/2019 | Volatile Organic Compounds | 0.22 Miles Southeast of MOL-1 | No | 137.01-176.96 feet (05/26/2020) | Towards the Northeast, with an average gradient of approximately 0.0019 feet per foot (ft/ft) (05/26/2020) |
| T0603702406 | 14117 Aetna St. Van Nuys, CA 91401 | Open - Remediation as of 2/2/2011 | Other Solvent or Non-Petroleum Hydrocarbon | 0.10 Miles West of MOL-4 | No | 169.16-176.96 feet (04/01/2020) | Southeast flow direction, gradient of 0.033 per foot (ft/ft (04/01/2020) |

# TABLE 2. GROUNDWATER DATA

| Concentration (ug/L) | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **GeoTracker ID** | **Sample ID** | **Acetone** | **Dibromochloromethane** | **1,1,1-Trichloroethane** | **Toluene** | **1,4-Dioxane** | **Perchlorate** | **Hexavalent** | **C4-C12** | **C10-C28** | **1,1,2-Trichloroethane** | **1,1-Dichloroethane** | **1,1-Dichloroethene** | **1,2-Dichloroethane** | **Benzene** | **Chloroform** | **cis-1,2-Dichloroethene** | **Di-isopropyl ether (DIPE)** | **Methyl-tert-butyl Ether (MTB** | **tert-Butanol (TBA)** | **Tetrachloroethene (PCE)** | **trans-1,2-Dichloroethene** | **Trichloroethene** |
| | **MCL** | **--** | **80** | **5** | **100** | **1** | **6** | **50** | **--** | **--** | **5** | **5** | **6** | **0.5** | **1** | **80** | **6** | **--** | **13** | **--** | **5** | **10** | **5** |
| SL1842891411 | MW1-R | < 20 | < 2.0 | < 1.0 | < 1.0 | n/a | n/a | n/a | n/a | n/a | < 1.0 | n/a | < 1.0 | n/a | n/a | 4.4 | n/a | n/a | n/a | n/a | < 1.0 | n/a | 91 |
| | MW3-R | Well has been dry since 10/2016 | | | | | | | | | | | | | | | | | | | | | |
| | MW4 | Well has been dry since 10/2016 | | | | | | | | | | | | | | | | | | | | | |
| | MW5 | < 20 | < 2.0 | < 1.0 | < 1.0 | n/a | n/a | n/a | n/a | n/a | < 1.0 | n/a | < 1.0 | n/a | n/a | 5.7 | n/a | n/a | n/a | n/a | < 1.0 | n/a | 180 |
| | MW8 | < 20 | < 2.0 | < 1.0 | < 1.0 | n/a | n/a | n/a | n/a | n/a | < 1.0 | n/a | < 1.0 | n/a | n/a | < 1.0 | n/a | n/a | n/a | n/a | < 1.0 | n/a | < 1.0 |
| | MW9 | < 20 | < 2.0 | < 1.0 | < 1.0 | n/a | n/a | n/a | n/a | n/a | < 1.0 | n/a | < 1.0 | n/a | n/a | < 1.0 | n/a | n/a | n/a | n/a | < 1.0 | n/a | < 1.0 |
| | MW10 | < 20 | < 2.0 | < 1.0 | < 1.0 | n/a | n/a | n/a | n/a | n/a | < 1.0 | n/a | < 1.0 | n/a | n/a | < 1.0 | n/a | n/a | n/a | n/a | 1.5 | n/a | < 1.0 |
| | MW10 DUP | < 20 | < 2.0 | < 1.0 | < 1.0 | n/a | n/a | n/a | n/a | n/a | < 1.0 | n/a | < 1.0 | n/a | n/a | < 1.0 | n/a | n/a | n/a | n/a | 1.4 | n/a | < 1.0 |
| T0603702406 | MW-5 | n/a | n/a | n/a | n/a | n/a | n/a | n/a | 550 | 47 | ND < 2.5 | ND < 2.5 | ND < 2.5 | ND < 2.5 | ND < 2.5 | 10 | ND < 2.5 | ND < 2.5 | ND < 2.5 | ND < 50 | 150 | ND < 2.5 | 320 |
| | MW-6 | n/a | n/a | n/a | n/a | n/a | n/a | n/a | 1200 | ND < 48 | 5.7 | 9.6 | 0.98 | 57 | 9.5 | 48 | 25 | 10 | ND < 0.50 | ND < 10 | 460 | 2.6 | 990 |
| | W-10 | n/a | n/a | n/a | n/a | n/a | n/a | n/a | 970 | ND < 47 | ND < 5.0 | ND < 5.0 | ND < 5.0 | 66 | 9.4 | 31 | ND < 5.0 | 6.8 | ND < 5.0 | ND < 100 | 280 | ND < 5.0 | 690 |
| | MW-4 | n/a | n/a | n/a | n/a | n/a | n/a | n/a | ND < 50 | 510 | ND < 0.50 | ND < 0.50 | ND < 0.50 | ND < 0.50 | ND < 0.50 | 0.61 | 1.9 | ND < 0.50 | ND < 5.0 | ND < 10 | 16 | ND < 0.50 | 14 |
| | W-9 | n/a | n/a | n/a | n/a | n/a | n/a | n/a | 360 | ND < 48 | ND < 2.5 | ND < 2.5 | ND < 2.5 | 13 | ND < 2.5 | 10 | ND < 2.5 | 3.6 | ND < 2.5 | ND < 50 | 110 | ND < 2.5 | 220 |
| | W-8 | n/a | n/a | n/a | n/a | n/a | n/a | n/a | 210 | ND < 48 | ND < 0.50 | 3.4 | ND < 0.50 | 5.3 | ND < 0.50 | 5 | 1.2 | 47 | 1.6 | ND < 10 | 75 | ND < 0.50 | 76 |
| | W-6 | n/a | n/a | n/a | n/a | n/a | n/a | n/a | ND < 50 | 4500 | ND < 0.50 | 0.51 | ND < 0.50 | 0.84 | ND < 0.50 | 1.3 | 1.2 | 1.2 | ND < 0.50 | ND < 10 | 4.4 | ND < 0.50 | 4.9 |
| | MW-7 | n/a | n/a | n/a | n/a | n/a | n/a | n/a | 1200 | ND < 47 | ND < 5.0 | ND < 5.0 | ND < 5.0 | ND < 5.0 | ND < 5.0 | 27 | 7.2 | ND < 5.0 | ND < 5.0 | ND < 100 | 310 | ND < 5.0 | 740 |
| | W-7 | n/a | n/a | n/a | n/a | n/a | n/a | n/a | 7500 | ND < 48 | ND < 50 | ND < 50 | ND < 50 | 86 | ND < 50 | ND < 50 | 89 | ND < 50 | 6600 | ND < 1000 | ND < 50 | ND < 50 | ND < 50 |
| | W-1 | n/a | n/a | n/a | n/a | n/a | n/a | n/a | 300 | ND < 48 | ND < 0.50 | 6.8 | ND < 0.50 | 5.8 | ND < 0.50 | 12 | 2.8 | 41 | 1 | ND < 10 | 93 | ND < 0.50 | 94 |
| | W-2 | n/a | n/a | n/a | n/a | n/a | n/a | n/a | 600 | ND < 48 | ND < 1.0 | 7.4 | ND < 1.0 | 47 | ND < 1.0 | 13 | 2.1 | 45 | 220 | 20 | 120 | ND < 1.0 | 140 |
| | W-5 | n/a | n/a | n/a | n/a | n/a | n/a | n/a | 12000 | 61 | ND < 100 | ND < 100 | ND < 100 | 150 | ND < 100 | ND < 100 | ND < 100 | 140 | 9800 | ND < 2000 | ND < 100 | ND < 100 | 160 |
| | W-3 | n/a | n/a | n/a | n/a | n/a | n/a | n/a | 2200 | ND < 48 | ND < 13 | 14 | ND < 13 | 57 | ND < 13 | ND < 13 | 49 | 46 | 1600 | ND < 250 | 110 | ND < 13 | 140 |
| | W-4 | n/a | n/a | n/a | n/a | n/a | n/a | n/a | 3000 | ND < 48 | ND < 10 | 13 | ND < 10 | 190 | ND < 10 | ND < 10 | 120 | 49 | 2600 | ND < 200 | 120 | ND < 10 | 85 |

The federal MCL is shown unless there is no federal MCL for that analyte or the California MCL is lower than the federal MCL

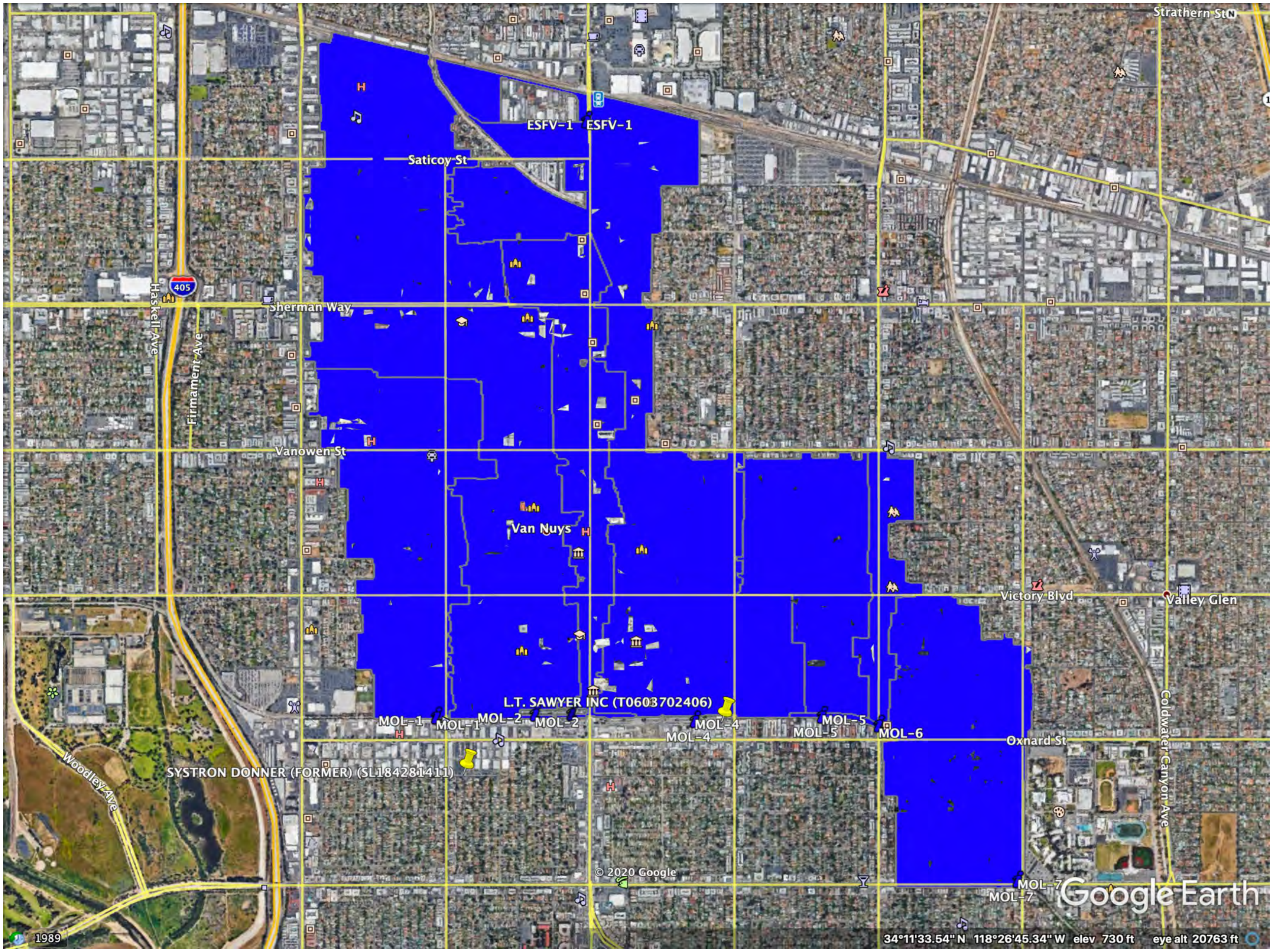
Yellow highlight indicates a value that exceeded the MCL

ND = Non-detect; n/a = not applicbale

-- = MCL value not provided

-- = contaminant has no establisehd federal/California MCL

Figure 1. Drainage Areas, Proposed Drywell Locations, and Active GeoTracker Sites (Yellow Pins)



# Existing Hydrology and Water Quality Condition

## Metro Orange Line Water Infiltration and Quality Project

# 1. INTRODUCTION

As part of the Safe Clean Water Program Feasibility Study for the Metro Orange Line Water Infiltration and Quality Project ("Project"), this attachment documents the methodology and modeling results that characterizes the existing hydrology and water quality condition. The modeling work was performed using Los Angeles County's Watershed Management System 2.0 (WMMS 2.0). Detailed model development methodology is presented below.

# 2. MODEL DEVELOPMENT

WMMS 2.0 is the latest watershed modeling system developed by the Los Angeles Flood Control District. It is released to the public in May 2020. WMMS 2.0 is a thorough upgrade to WMMS 1.0 that was previously released in August 2013. In comparison to the previous version, WMMS 2.0 is calibrated based on hydrology and water quality monitoring data collected up to 2018 and can therefore more accurately simulate contaminant loading, runoff volume, and flow rate associated with various design storms and long-term simulation for all major watershed within Los Angeles County. WMMS 2.0 contains two major components: a Loading Simulation Program in C++ (LSPC), which is a watershed modelling system to simulate runoff and pollutant loading; and a System for Urban Stormwater Treatment and Analysis Integration (SUSTAIN), which utilizes LSPC model output and evaluates BMP performance in terms of pollutant load reduction and runoff volume reduction.

The hydrologic analysis included the development of a 10-year continuous simulation model between 10/1/2008 and 9/30/2018. Although the September 2019 Feasibility Study Guidelines state that a minimum of 20-years should be used for the annual average calculations, LA County staff have since requested that the modeling period match that of the online module which is 10/1/2008 – 09/30/2018

For the WMMS 2.0 model, the baseline LSPC model was modified by editing the subwatershed boundary and hydrologic response unit (HRU) parameters to simulate dry and wet weather runoff from the Project drainage areas[1]. The hydrologic response unit (HRU) within the revised subwaterhsed boundary was updated accordingly using the HRU raster downloaded from WMMS 2.0 website. It is assumed that the baseline LSPC model has been calibrated by LACFCD to reflect the hydrologic condition within each watershed in Los Angeles County. Default parameters were used unless site-specific modification was required (e.g. subwatershed boundary).

---

[1] Model input was developed and executed using LSPC v6.0 provided in the WMMS 2.0 application package

## 3. ASSUMPTIONS AND APPROACH

The WMMS 2.0 input parameters assumed for each scenario included:

- **Precipitation and Model Run Time:** Taken directly from the baseline WMMS 2.0 database, the default rain gauges assigned to LSPC subwatersheds 6839, 6844, 6850, 6856, 6859 and 6861 and model run time (10/1/2008 – 09/30/2018) were used for the simulation to be consistent with the recommended modeling period specified in the SCW online module. The 10-year hyetographs for the selected rain gauges are shown in Figure 1.

- **Dry-weather Runoff Estimate:** The LSPC model simulation estimated the dry weather runoff as a function of irrigated pervious HRU. This was updated for the updated Project drainage area described in previous attachment.

- **Soils:** Taken directly from the baseline WMMS model, the default WMMS soil parameters adopted from LSPC subwatersheds 6839, 6844, 6850, 6856, 6859 and 6861 were used in the simulation.

## 4. RESULTS

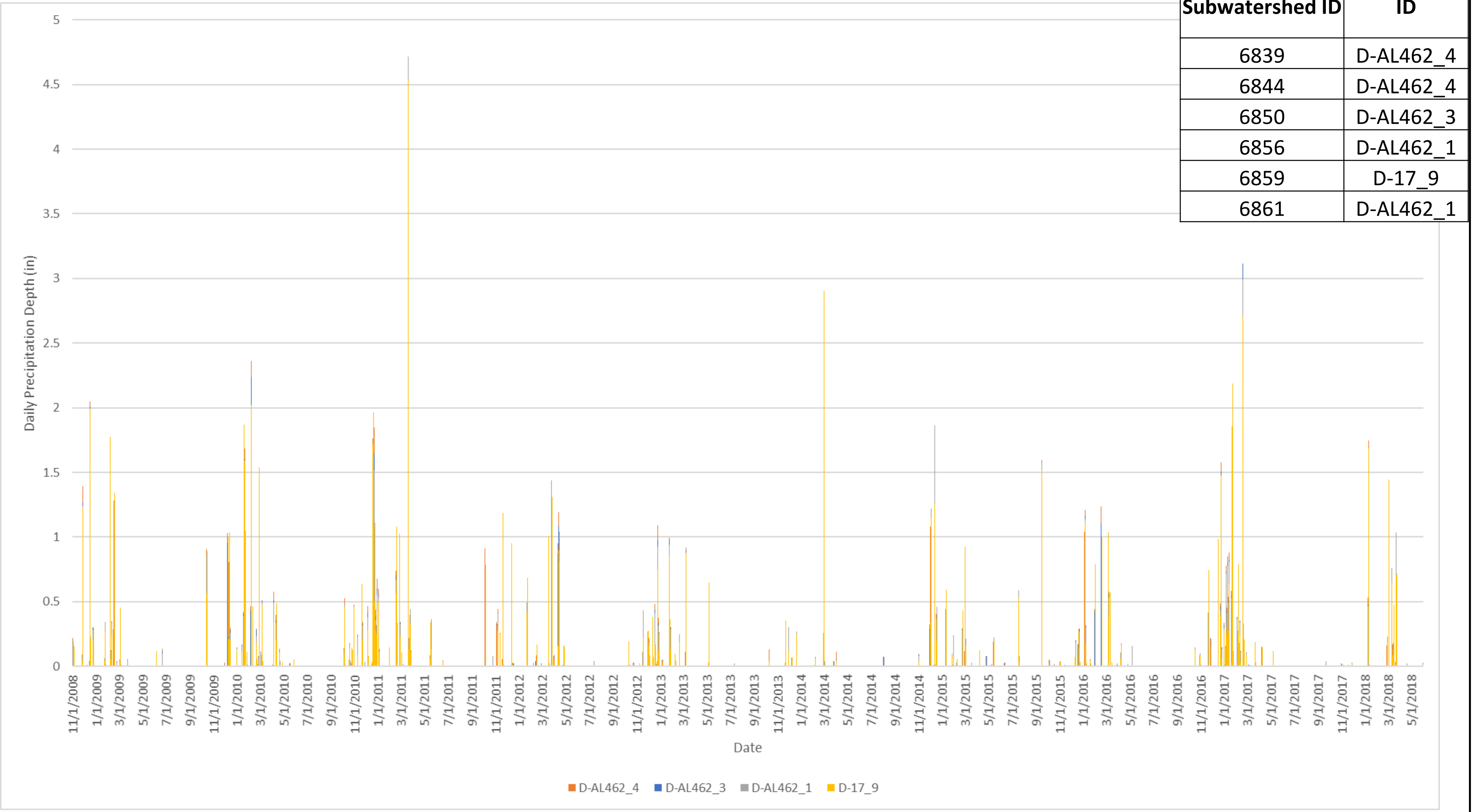
Table 1 summarizes the existing pollutant loading and runoff volume under the existing condition (e.g. without proposed Project) from the 10-year long term simulation. This section summarizes the modeling output. All model input and output files are provided in Appendix A.

**Table 1. Average Annual Hydrology and Water Quality Summary of the Existing Condition**

| Metric | Dry Weather | Wet Weather |
|---|---|---|
| Average Inflow Rate (cfs) | 0.1 | 98.4 |
| Runoff Volume (ac-ft) | 17 | 1410 |
| Total Zinc (ug/L) | 244 | |
| Total Zinc (lbs) | 898 | |
| Total Copper (ug/L) | 59 | |
| Total Copper (lbs) | 218 | |
| Total Lead (ug/L) | 32 | |
| Total Lead (lbs) | 117 | |
| Total Nitrogen (mg/L) | 1.4 | |
| Total Nitrogen (lbs) | 5290 | |
| Total Phosphorous (mg/L) | 0.2 | |
| Total Phosphorous (lbs) | 844 | |

# FIGURES

| LSPC Subwatershed ID | Rain Gauge ID |
|---|---|
| 6839 | D-AL462_4 |
| 6844 | D-AL462_4 |
| 6850 | D-AL462_3 |
| 6856 | D-AL462_1 |
| 6859 | D-17_9 |
| 6861 | D-AL462_1 |



## 10-Year Hyetograph

**Metro Orange Line Water Infiltration and Quality Project – Existing Hydrology and Water Quality Condition**
Los Angeles, CA

Geosyntec
consultants

**Figure**

**1**

Los Angeles

October 2020

# APPENDIX A

## WMMS 2.0 LSPC Model Input

*Output not included as it contains 10,000+ lines of times series output. Output can be provided as electronic copy upon request.

# LSPC Model – Existing Condition

```
c-----------------------------------------------------------------------------------------
c LSPC -- Loading Simulation Program, C++
c Version 6.0 (64-bit) - Jan 2020
c
c Created through code updates by:
c Paradigm Environmental, Inc.
c San Diego, California, USA
c www.paradigmh2o.com
c
c Based upon LSPC version 5.0 (Mar 2018), originally developed by :
c United States Environmental Protection Agency
c with support by Tetra Tech, Inc.
c https://github.com/USEPA/LSPC-Loading-Simulation-Program
c
c NOTE: The line starting with the letter c and followed by space or - is a comment line.
c       There must be no comment line in between the data lines
c       The input text field must be a continuous string without any space in between the characters
c-----------------------------------------------------------------------------------------
c LSPC MODEL INPUT FILE
c This input file was created at 10:54:42pm on 09/10/2020
c-----------------------------------------------------------------------------------------
c0   general control
c
c    snowfg   if = 1 run snow module
c    pwatfg   if = 1 run pwater
c    sedfg    if = 1 run sediment
c    pqalfg   if = 1 run general quality
c    tempfg   if = 1 run temperature module
c    oxfg     if = 1 run DO-BOD module
c    nutfg    if = 1 run nutrients module
c    plkfg    if = 1 run plank module
c    phfg     if = 1 run pH-CO2 module
c
c snowfg  pwatfg  sedfg  pqalfg  tempfg  oxfg  nutfg  plkfg  phfg
       0       1      1       1       0      0       0      0       0
c-----------------------------------------------------------------------------------------
c10  weather file definition (name and parameters)
c
c    wfileid    weather file id
c    wfilename  weather file name
c    wparamnum  number of parameters in the weather file
c    wparamid   weather paramter id
c               1-precipitation (in/ivl)
c               2-potential evaporation (in/ivl)
c               3-air temperature (degree F)
c               4-wind speed (mile/ivl)
c               5-solar radiation (ly/ivl)
c               6-dew point (degree F)
c               7-cloud cover (tenth)
c
c wfileid   wfilename   wparamnum   wparamid...
       1792    D-AL462_4.pre  1      1
       1794    D-AL462_1.pre  1      1
       1795    D-AL464_2.pre  1      1
       1796    P-AL464_2.pre  1      1
       1797    P-AL462_1.pre  1      1
       1855    D-17_9.pre     1      1
       1857    D-AL462_3.pre  1      1
       2076    x53y74.air     1      2
c-----------------------------------------------------------------------------------------
c15  weather station definition (station id and associated weather files)
c
c    wstationid  weather station id
c    wfilenum   number of files for the weather station
c    wfileid    weather file id (card 10)
c
c   wstationid   wfilenum   wfileid...
       792     2      1792    2076
       794     2      1794    2076
       795     2      1795    2076
       796     2      1796    2076
       797     2      1797    2076
       855     2      1855    2076
       857     2      1857    2076
c-----------------------------------------------------------------------------------------
```

```
c20  weather parameter multiplier
c
c    wstationid  weather station id (card 15)
c    wparmmult   multiplier for each weather parameter
c       1- multiplier for precipitation
c       2- multiplier for potential evapotranspiration
c       3- multiplier for air temperature
c       4- multiplier for wind speed
c       5- multiplier for solar radiation
c       6- multiplier for dew point
c       7- multiplier for cloud cover
c
c  wstationid  wparmmult1...
        792    1.000000       1.000000
        794    1.000000       1.000000
        795    1.000000       1.000000
        796    1.000000       1.000000
        797    1.000000       1.000000
        855    1.000000       1.000000
        857    1.000000       1.000000
c-----------------------------------------------------------------------------------------
c30 output file path     input (weather) file path  (each must be a continuous string)
        C:\WMMS2 LSPC Map\^LA0583005\Output\10-Year\RO\      C:\WMMS2 LSPC Map\DataPackage\Weather\
c-----------------------------------------------------------------------------------------
c40 general watershed controls
c
c    nsubbasin   number of subwatersheds
c    nrchid      number of stream channels (corresponds with number of subwatersheds)
c    nrgid       number of stream groups to assign parameters
c    ndefid      number of land groups to assign parameters
c    ndeluid     maximum number of land use
c
c nsws   nrch    nrgroup    nlgroup    nlandp
        12     12      2      2      96
c-----------------------------------------------------------------------------------------
c45  general output controls
c
c    Standard    Output standard model parameters
c    Snow        Output snow related parameters
c    Hydrology   Output hydrology related parameters
c    Sediment    Output sediment related parameters
c    GQUAL       Output general water quality related parameters
c    RQUAL       Output biochemical water quality related parameters
c    Custom      Output user specified parameters
c    Landuse     Output landuse summary
c                 if = 0 no output
c                 if = 1 average annual output
c                 if = 2 yearly output
c                 if = 3 monthly output
c    Stream      Output stream summary
c                 if = 0 no output
c                 if = 1 average annual output
c                 if = 2 yearly output
c                 if = 3 monthly output
c    PointSource Output point source summary
c                 if = 0 no output
c                 if = 1 average annual output
c                 if = 2 yearly output
c                 if = 3 monthly output
c    Threshold   Output threshold analysis summary
c                 if = 0 no output
c                 if = 1 average monthly output
c    SUSTAIN     Output unit-area land timeseries for SUSTAIN external option
c                 if = 0 no output
c                 if = 1 timeseries output
c
c Standard  Snow  Hydrology  Sediment  GQUAL  RQUAL  Custom  Landuse  Stream  PointSource  Threshold  SUSTAIN
        0      0      0      0      0      0      1      1      1      1      0      0
c-----------------------------------------------------------------------------------------
c46  user specified output parameter list
c
c   PRECP   AIRTMP  SNOTMP  SNOWF   RAINF   PRAIN   MELT   SNOWE  WYIELD  PACK    PACKF   PACKW   PACKI   PDEPTH
COVINDX   NEGHTS  XLNMELT     RDENPKF     SKYCLEAR    SNOCOV  DULLNESS    ALBEDO     PAKTEMP     DEWTMP  SURS
UZS     LZS     AGWS    SURO    IFWO  AGWO    PERO    TAET    PERC    INFIL   GWI     IGWI    AGWI      DEP
AVDEP   HRAD    AVVEL   SAREA   VOLUME   RO  TAU   WSSD   SCRSD   SOSED  SOBER   SSEDC  LSSED   LRSED  LBEDDEP
LDEPSCR     LROSED  SQO     WASHQS  SCRQS   SOQO    POQUAL  SOQUAL  IOQUAL    GOQUAL  POQC  CONC  CONCOUT
CONCSQAL   MATSQAL  MATIN   MATOUT   MATOSQAL  DOX   DOXMIN  DOXMAX   DOXAV   DOXX   BOD   BODX  NO3   NO3X
TAM    TAMX    NO2    NO2X    PO4    PO4X   SNH4   SNH4X   SPO4   SPO4X    PHYTO   PHYTOX   PHYCLA   BENAL   ORN
ORNX    ORP     ORPX   ORC   ORCX   NOX   DIN   TN   TP   PH   ALK   TIC   TICX   CO2   CO2X   TEMP
```

```
       1       0       0       0       0       0       0       0       0       0       0       0       0       0
       0       0       0       0       0       0       0       0       0       0       0       0       0       0
       0       0       0       0       0       0       0       0       0       0       0       0       0       0
       0       0       1       0       0       0       0       0       0       1       0       0       0       0
       0       0       0       0       0       0       0       0       0       0       1       0       0       0
       0       0       0       0       0       0       0       0       0       0       0       0       0       0
       0       0       0       0       0       0       0       0       0       0       0       0       0       0
       0       0       0       0       0       0       0       0       0       0       0       0       0       0
c-----------------------------------------------------------------------------------------
c50  model simulation time period
c
c    mstart   model start day.
c    mend     model end day.
c    deltm    time step in minutes.
c    mostart  model output start day.
c    moend    model output end day.
c    optlevel  if = 1 general output (daily)
c              if = 2 output per hour (hourly)
c              if = 3 output per time interval (minute)
c
c mstart   mend    deltm mostart    moend   optlevel
       10/1/2006      10/1/2018      60      10/1/2008      10/1/2018      3
c-----------------------------------------------------------------------------------------
c60  group information
c
c    subbasin  subbasin id
c    defid     group parameter id
c    nwst      number of weather stations assigned to the watershed
c    wsti = station id
c    wti = weighting to calculate input
c
c subbasin   defid   nwst  wst1   wt1   wst2   wt2   ...
       6665   40      1      792    1.000000
       6671   33      1      794    1.000000
       6673   33      1      857    1.000000
       6674   33      1      795    1.000000
       6675   33      1      795    1.000000
       6684   40      1      797    1.000000
       6839   33      1      792    1.000000
       6844   40      1      792    1.000000
       6850   33      1      857    1.000000
       6856   40      1      794    1.000000
       6859   33      1      855    1.000000
       6861   40      1      794    1.000000
c-----------------------------------------------------------------------------------------
c70  modeled land use names
c
c    deluid     landuse id
c    deluname   landuse name
c    premult    multiplier for precipitation
c    petmult    multiplier for potential evapotranspiration
c
c deluid  deluname  premult  petmult
       1000   Road_Freeway-All-All-All      1.000000       0.300000
       2000   Road_Primary-All-All-All      1.000000       0.300000
       3000   Road_Minor-All-All-All 1.000000       0.300000
       4000   Dev_ResHigh-All-All-All       1.000000       0.300000
       5000   Dev_ResLow-All-All-All 1.000000       0.300000
       6000   Dev_Com-All-All-All    1.000000       0.300000
       7000   Dev_Ind-All-All-All    1.000000       0.300000
       8000   Dev_Inst-All-All-All   1.000000       0.300000
       9000   Dev_Roof-All-All-All   1.000000       0.300000
       10000  Dev_Overspray-All-All-All     1.000000       0.300000
       11111  Dev_Irrigated-A-Low-Confined  1.000000       0.500000
       11112  Dev_Irrigated-A-Low-Unconfined       1.000000       0.500000
       11121  Dev_Irrigated-A-Med-Confined  1.000000       0.500000
       11122  Dev_Irrigated-A-Med-Unconfined       1.000000       0.500000
       11211  Dev_Irrigated-B-Low-Confined  1.000000       0.500000
       11212  Dev_Irrigated-B-Low-Unconfined       1.000000       0.500000
       11221  Dev_Irrigated-B-Med-Confined  1.000000       0.500000
       11222  Dev_Irrigated-B-Med-Unconfined       1.000000       0.500000
       11311  Dev_Irrigated-C-Low-Confined  1.000000       0.500000
       11312  Dev_Irrigated-C-Low-Unconfined       1.000000       0.500000
       11321  Dev_Irrigated-C-Med-Confined  1.000000       0.500000
       11322  Dev_Irrigated-C-Med-Unconfined       1.000000       0.500000
       11411  Dev_Irrigated-D-Low-Confined  1.000000       0.500000
       11412  Dev_Irrigated-D-Low-Unconfined       1.000000       0.500000
       11421  Dev_Irrigated-D-Med-Confined  1.000000       0.500000
       11422  Dev_Irrigated-D-Med-Unconfined       1.000000       0.500000
```

```
       12111   Dev_Pervious-A-Low-Confined   1.000000       0.500000
       12112   Dev_Pervious-A-Low-Unconfined 1.000000       0.500000
       12121   Dev_Pervious-A-Med-Confined   1.000000       0.500000
       12122   Dev_Pervious-A-Med-Unconfined 1.000000       0.500000
       12211   Dev_Pervious-B-Low-Confined   1.000000       0.500000
       12212   Dev_Pervious-B-Low-Unconfined 1.000000       0.500000
       12221   Dev_Pervious-B-Med-Confined   1.000000       0.500000
       12222   Dev_Pervious-B-Med-Unconfined 1.000000       0.500000
       12311   Dev_Pervious-C-Low-Confined   1.000000       0.500000
       12312   Dev_Pervious-C-Low-Unconfined 1.000000       0.500000
       12321   Dev_Pervious-C-Med-Confined   1.000000       0.500000
       12322   Dev_Pervious-C-Med-Unconfined 1.000000       0.500000
       12411   Dev_Pervious-D-Low-Confined   1.000000       0.500000
       12412   Dev_Pervious-D-Low-Unconfined 1.000000       0.500000
       12421   Dev_Pervious-D-Med-Confined   1.000000       0.500000
       12422   Dev_Pervious-D-Med-Unconfined 1.000000       0.500000
       13111   Agriculture-A-Low-Confined    1.000000       1.000000
       13112   Agriculture-A-Low-Unconfined  1.000000       1.000000
       13121   Agriculture-A-Med-Confined    1.000000       1.000000
       13122   Agriculture-A-Med-Unconfined  1.000000       1.000000
       13211   Agriculture-B-Low-Confined    1.000000       1.000000
       13212   Agriculture-B-Low-Unconfined  1.000000       1.000000
       13221   Agriculture-B-Med-Confined    1.000000       1.000000
       13222   Agriculture-B-Med-Unconfined  1.000000       1.000000
       13231   Agriculture-B-High-Confined   1.000000       1.000000
       13232   Agriculture-B-High-Unconfined 1.000000       1.000000
       13311   Agriculture-C-Low-Confined    1.000000       1.000000
       13312   Agriculture-C-Low-Unconfined  1.000000       1.000000
       13321   Agriculture-C-Med-Confined    1.000000       1.000000
       13322   Agriculture-C-Med-Unconfined  1.000000       1.000000
       13331   Agriculture-C-High-Confined   1.000000       1.000000
       13411   Agriculture-D-Low-Confined    1.000000       1.000000
       13412   Agriculture-D-Low-Unconfined  1.000000       1.000000
       13421   Agriculture-D-Med-Confined    1.000000       1.000000
       13422   Agriculture-D-Med-Unconfined  1.000000       1.000000
       13431   Agriculture-D-High-Confined   1.000000       1.000000
       13432   Agriculture-D-High-Unconfined 1.000000       1.000000
       14121   Veg_Low-A-Med-Confined 1.000000       1.000000
       14122   Veg_Low-A-Med-Unconfined      1.000000       1.000000
       14131   Veg_Low-A-High-Confined       1.000000       1.000000
       14132   Veg_Low-A-High-Unconfined     1.000000       1.000000
       14221   Veg_Low-B-Med-Confined 1.000000       1.000000
       14222   Veg_Low-B-Med-Unconfined      1.000000       1.000000
       14231   Veg_Low-B-High-Confined       1.000000       1.000000
       14232   Veg_Low-B-High-Unconfined     1.000000       1.000000
       14321   Veg_Low-C-Med-Confined 1.000000       1.000000
       14322   Veg_Low-C-Med-Unconfined      1.000000       1.000000
       14331   Veg_Low-C-High-Confined       1.000000       1.000000
       14332   Veg_Low-C-High-Unconfined     1.000000       1.000000
       14421   Veg_Low-D-Med-Confined 1.000000       1.000000
       14422   Veg_Low-D-Med-Unconfined      1.000000       1.000000
       14431   Veg_Low-D-High-Confined       1.000000       1.000000
       14432   Veg_Low-D-High-Unconfined     1.000000       1.000000
       15121   Veg_High-A-Med-Confined       1.000000       1.000000
       15122   Veg_High-A-Med-Unconfined     1.000000       1.000000
       15131   Veg_High-A-High-Confined      1.000000       1.000000
       15132   Veg_High-A-High-Unconfined    1.000000       1.000000
       15221   Veg_High-B-Med-Confined       1.000000       1.000000
       15222   Veg_High-B-Med-Unconfined     1.000000       1.000000
       15231   Veg_High-B-High-Confined      1.000000       1.000000
       15232   Veg_High-B-High-Unconfined    1.000000       1.000000
       15321   Veg_High-C-Med-Confined       1.000000       1.000000
       15322   Veg_High-C-Med-Unconfined     1.000000       1.000000
       15331   Veg_High-C-High-Confined      1.000000       1.000000
       15332   Veg_High-C-High-Unconfined    1.000000       1.000000
       15421   Veg_High-D-Med-Confined       1.000000       1.000000
       15422   Veg_High-D-Med-Unconfined     1.000000       1.000000
       15431   Veg_High-D-High-Confined      1.000000       1.000000
       15432   Veg_High-D-High-Unconfined    1.000000       1.000000
       16000   Water-All-All-All     1.000000       1.000000
c-----------------------------------------------------------------------------------------
c80  land use to stream routing
c
c    defid       landuse default group id
c    deluid      land use id
c    route_suro  fraction of surface runoff that routes to the stream (0-1) (default=1)
c                if negative (<0) value then that fraction will be lost from the system
c    route_ifwo  fraction of interflow outflow that routes to the stream (0-1) (default=1)
c                if negative (<0) value then that fraction will be lost from the system
```

```
c    route_agwo  fraction of groundwater outflow that routes to the stream (0-1) (default=1)
c                if negative (<0) value then that fraction will be lost from the system
c
c    Example: 0.3 means 30% of outflow routes to the stream and 70% bypasses to the next down stream in the
reach network
c            -0.3 means 30% of outflow is permanently lost from the system and 70% routes to the stream
c             Enter a value of -1 to permanently lose all water from the respective layer
c             This convention applies to all three parameters (route_suro, route_ifwo, and route_agwo)
c
c  defid  deluid  route_suro  route_ifwo  route_agwo
        33      1000    1.000000       1.000000       -1.000000
        33      2000    1.000000       1.000000       -1.000000
        33      3000    1.000000       1.000000       -1.000000
        33      4000    1.000000       1.000000       -1.000000
        33      5000    1.000000       1.000000       -1.000000
        33      6000    1.000000       1.000000       -1.000000
        33      7000    1.000000       1.000000       -1.000000
        33      8000    1.000000       1.000000       -1.000000
        33      9000    1.000000       1.000000       -1.000000
        33      10000   1.000000       1.000000       -1.000000
        33      11111   1.000000       1.000000       -0.900000
        33      11112   1.000000       1.000000       -0.900000
        33      11121   1.000000       1.000000       -0.900000
        33      11122   1.000000       1.000000       -0.900000
        33      11211   1.000000       1.000000       -0.900000
        33      11212   1.000000       1.000000       -0.900000
        33      11221   1.000000       1.000000       -0.900000
        33      11222   1.000000       1.000000       -0.900000
        33      11311   1.000000       1.000000       -0.900000
        33      11312   1.000000       1.000000       -0.900000
        33      11321   1.000000       1.000000       -0.900000
        33      11322   1.000000       1.000000       -0.900000
        33      11411   1.000000       1.000000       -0.900000
        33      11412   1.000000       1.000000       -0.900000
        33      11421   1.000000       1.000000       -0.900000
        33      11422   1.000000       1.000000       -0.900000
        33      12111   1.000000       1.000000       -0.900000
        33      12112   1.000000       1.000000       -0.900000
        33      12121   1.000000       1.000000       -0.900000
        33      12122   1.000000       1.000000       -0.900000
        33      12211   1.000000       1.000000       -0.900000
        33      12212   1.000000       1.000000       -0.900000
        33      12221   1.000000       1.000000       -0.900000
        33      12222   1.000000       1.000000       -0.900000
        33      12311   1.000000       1.000000       -0.900000
        33      12312   1.000000       1.000000       -0.900000
        33      12321   1.000000       1.000000       -0.900000
        33      12322   1.000000       1.000000       -0.900000
        33      12411   1.000000       1.000000       -0.900000
        33      12412   1.000000       1.000000       -0.900000
        33      12421   1.000000       1.000000       -0.900000
        33      12422   1.000000       1.000000       -0.900000
        33      13111   1.000000       1.000000       -0.500000
        33      13112   1.000000       1.000000       -0.500000
        33      13121   1.000000       1.000000       -0.500000
        33      13122   1.000000       1.000000       -0.500000
        33      13211   1.000000       1.000000       -0.500000
        33      13212   1.000000       1.000000       -0.500000
        33      13221   1.000000       1.000000       -0.500000
        33      13222   1.000000       1.000000       -0.500000
        33      13231   1.000000       1.000000       -0.500000
        33      13232   1.000000       1.000000       -0.500000
        33      13311   1.000000       1.000000       -0.500000
        33      13312   1.000000       1.000000       -0.500000
        33      13321   1.000000       1.000000       -0.500000
        33      13322   1.000000       1.000000       -0.500000
        33      13331   1.000000       1.000000       -0.500000
        33      13411   1.000000       1.000000       -0.500000
        33      13412   1.000000       1.000000       -0.500000
        33      13421   1.000000       1.000000       -0.500000
        33      13422   1.000000       1.000000       -0.500000
        33      13431   1.000000       1.000000       -0.500000
        33      13432   1.000000       1.000000       -0.500000
        33      14121   1.000000       1.000000       -0.500000
        33      14122   1.000000       1.000000       -0.500000
        33      14131   1.000000       1.000000       -0.500000
        33      14132   1.000000       1.000000       -0.500000
        33      14221   1.000000       1.000000       -0.500000
        33      14222   1.000000       1.000000       -0.500000
```

| | | | | |
|---|---|---|---|---|
| 33 | 14231 | 1.000000 | 1.000000 | -0.500000 |
| 33 | 14232 | 1.000000 | 1.000000 | -0.500000 |
| 33 | 14321 | 1.000000 | 1.000000 | -0.500000 |
| 33 | 14322 | 1.000000 | 1.000000 | -0.500000 |
| 33 | 14331 | 1.000000 | 1.000000 | -0.500000 |
| 33 | 14332 | 1.000000 | 1.000000 | -0.500000 |
| 33 | 14421 | 1.000000 | 1.000000 | -0.500000 |
| 33 | 14422 | 1.000000 | 1.000000 | -0.500000 |
| 33 | 14431 | 1.000000 | 1.000000 | -0.500000 |
| 33 | 14432 | 1.000000 | 1.000000 | -0.500000 |
| 33 | 15121 | 1.000000 | 1.000000 | -0.500000 |
| 33 | 15122 | 1.000000 | 1.000000 | -0.500000 |
| 33 | 15131 | 1.000000 | 1.000000 | -0.500000 |
| 33 | 15132 | 1.000000 | 1.000000 | -0.500000 |
| 33 | 15221 | 1.000000 | 1.000000 | -0.500000 |
| 33 | 15222 | 1.000000 | 1.000000 | -0.500000 |
| 33 | 15231 | 1.000000 | 1.000000 | -0.500000 |
| 33 | 15232 | 1.000000 | 1.000000 | -0.500000 |
| 33 | 15321 | 1.000000 | 1.000000 | -0.500000 |
| 33 | 15322 | 1.000000 | 1.000000 | -0.500000 |
| 33 | 15331 | 1.000000 | 1.000000 | -0.500000 |
| 33 | 15332 | 1.000000 | 1.000000 | -0.500000 |
| 33 | 15421 | 1.000000 | 1.000000 | -0.500000 |
| 33 | 15422 | 1.000000 | 1.000000 | -0.500000 |
| 33 | 15431 | 1.000000 | 1.000000 | -0.500000 |
| 33 | 15432 | 1.000000 | 1.000000 | -0.500000 |
| 33 | 16000 | 1.000000 | 1.000000 | -0.500000 |
| 40 | 1000 | -0.400000 | -0.900000 | -1.000000 |
| 40 | 2000 | -0.400000 | -0.900000 | -1.000000 |
| 40 | 3000 | -0.400000 | -0.900000 | -1.000000 |
| 40 | 4000 | -0.400000 | -0.900000 | -1.000000 |
| 40 | 5000 | -0.400000 | -0.900000 | -1.000000 |
| 40 | 6000 | -0.400000 | -0.900000 | -1.000000 |
| 40 | 7000 | -0.400000 | -0.900000 | -1.000000 |
| 40 | 8000 | -0.400000 | -0.900000 | -1.000000 |
| 40 | 9000 | -0.400000 | -0.900000 | -1.000000 |
| 40 | 10000 | -0.400000 | -0.900000 | -1.000000 |
| 40 | 11111 | -0.400000 | -0.900000 | -0.900000 |
| 40 | 11112 | -0.400000 | -0.900000 | -0.900000 |
| 40 | 11121 | -0.400000 | -0.900000 | -0.900000 |
| 40 | 11122 | -0.400000 | -0.900000 | -0.900000 |
| 40 | 11211 | -0.400000 | -0.900000 | -0.900000 |
| 40 | 11212 | -0.400000 | -0.900000 | -0.900000 |
| 40 | 11221 | -0.400000 | -0.900000 | -0.900000 |
| 40 | 11222 | -0.400000 | -0.900000 | -0.900000 |
| 40 | 11311 | -0.400000 | -0.900000 | -0.900000 |
| 40 | 11312 | -0.400000 | -0.900000 | -0.900000 |
| 40 | 11321 | -0.400000 | -0.900000 | -0.900000 |
| 40 | 11322 | -0.400000 | -0.900000 | -0.900000 |
| 40 | 11411 | -0.400000 | -0.900000 | -0.900000 |
| 40 | 11412 | -0.400000 | -0.900000 | -0.900000 |
| 40 | 11421 | -0.400000 | -0.900000 | -0.900000 |
| 40 | 11422 | -0.400000 | -0.900000 | -0.900000 |
| 40 | 12111 | -0.400000 | -0.900000 | -0.900000 |
| 40 | 12112 | -0.400000 | -0.900000 | -0.900000 |
| 40 | 12121 | -0.400000 | -0.900000 | -0.900000 |
| 40 | 12122 | -0.400000 | -0.900000 | -0.900000 |
| 40 | 12211 | -0.400000 | -0.900000 | -0.900000 |
| 40 | 12212 | -0.400000 | -0.900000 | -0.900000 |
| 40 | 12221 | -0.400000 | -0.900000 | -0.900000 |
| 40 | 12222 | -0.400000 | -0.900000 | -0.900000 |
| 40 | 12311 | -0.400000 | -0.900000 | -0.900000 |
| 40 | 12312 | -0.400000 | -0.900000 | -0.900000 |
| 40 | 12321 | -0.400000 | -0.900000 | -0.900000 |
| 40 | 12322 | -0.400000 | -0.900000 | -0.900000 |
| 40 | 12411 | -0.400000 | -0.900000 | -0.900000 |
| 40 | 12412 | -0.400000 | -0.900000 | -0.900000 |
| 40 | 12421 | -0.400000 | -0.900000 | -0.900000 |
| 40 | 12422 | -0.400000 | -0.900000 | -0.900000 |
| 40 | 13111 | -0.400000 | -0.500000 | -0.800000 |
| 40 | 13112 | -0.400000 | -0.500000 | -0.800000 |
| 40 | 13121 | -0.400000 | -0.500000 | -0.800000 |
| 40 | 13122 | -0.400000 | -0.500000 | -0.800000 |
| 40 | 13211 | -0.400000 | -0.500000 | -0.800000 |
| 40 | 13212 | -0.400000 | -0.500000 | -0.800000 |
| 40 | 13221 | -0.400000 | -0.500000 | -0.800000 |
| 40 | 13222 | -0.400000 | -0.500000 | -0.800000 |
| 40 | 13231 | -0.400000 | -0.500000 | -0.800000 |
| 40 | 13232 | -0.400000 | -0.500000 | -0.800000 |

```
        40      13311   -0.400000      -0.500000      -0.800000
        40      13312   -0.400000      -0.500000      -0.800000
        40      13321   -0.400000      -0.500000      -0.800000
        40      13322   -0.400000      -0.500000      -0.800000
        40      13331   -0.400000      -0.500000      -0.800000
        40      13411   -0.400000      -0.500000      -0.800000
        40      13412   -0.400000      -0.500000      -0.800000
        40      13421   -0.400000      -0.500000      -0.800000
        40      13422   -0.400000      -0.500000      -0.800000
        40      13431   -0.400000      -0.500000      -0.800000
        40      13432   -0.400000      -0.500000      -0.800000
        40      14121   -0.400000      -0.500000      -0.800000
        40      14122   -0.400000      -0.500000      -0.800000
        40      14131   -0.400000      -0.500000      -0.800000
        40      14132   -0.400000      -0.500000      -0.800000
        40      14221   -0.400000      -0.500000      -0.800000
        40      14222   -0.400000      -0.500000      -0.800000
        40      14231   -0.400000      -0.500000      -0.800000
        40      14232   -0.400000      -0.500000      -0.800000
        40      14321   -0.400000      -0.500000      -0.800000
        40      14322   -0.400000      -0.500000      -0.800000
        40      14331   -0.400000      -0.500000      -0.800000
        40      14332   -0.400000      -0.500000      -0.800000
        40      14421   -0.400000      -0.500000      -0.800000
        40      14422   -0.400000      -0.500000      -0.800000
        40      14431   -0.400000      -0.500000      -0.800000
        40      14432   -0.400000      -0.500000      -0.800000
        40      15121   -0.400000      -0.500000      -0.800000
        40      15122   -0.400000      -0.500000      -0.800000
        40      15131   -0.400000      -0.500000      -0.800000
        40      15132   -0.400000      -0.500000      -0.800000
        40      15221   -0.400000      -0.500000      -0.800000
        40      15222   -0.400000      -0.500000      -0.800000
        40      15231   -0.400000      -0.500000      -0.800000
        40      15232   -0.400000      -0.500000      -0.800000
        40      15321   -0.400000      -0.500000      -0.800000
        40      15322   -0.400000      -0.500000      -0.800000
        40      15331   -0.400000      -0.500000      -0.800000
        40      15332   -0.400000      -0.500000      -0.800000
        40      15421   -0.400000      -0.500000      -0.800000
        40      15422   -0.400000      -0.500000      -0.800000
        40      15431   -0.400000      -0.500000      -0.800000
        40      15432   -0.400000      -0.500000      -0.800000
        40      16000   -0.400000      -0.500000      -0.800000
c------------------------------------------------------------------------------------------
c90  land use information
c
c    subbasin   subbasin id
c    deluid     land use id
c    deluname   land use name
c    perimp     1 imperivous land (subsurface processes disabled)
c               2 pervious  land (subsurface processes activated)
c    area_ac    area (acres)
c    slsur      slope of overland flow plane (none)
c    lsur       length of overland flow plane (feet)
c
c  subbasin  deluid  deluname  perimp  area_ac  slsur  lsur
        6665    1000    Road_Freeway-All-All-All      1       0.000000       0.010000       100.000000
        6665    2000    Road_Primary-All-All-All      1       8.985516       0.010000       100.000000
        6665    3000    Road_Minor-All-All-All 1      2.325384       0.010000       100.000000
        6665    4000    Dev_ResHigh-All-All-All       1       3.402785       0.010000       100.000000
        6665    5000    Dev_ResLow-All-All-All 1      1.636626       0.010000       100.000000
        6665    6000    Dev_Com-All-All-All    1      4.142739       0.010000       100.000000
        6665    7000    Dev_Ind-All-All-All    1      0.000000       0.010000       100.000000
        6665    8000    Dev_Inst-All-All-All   1      3.182982       0.010000       100.000000
        6665    9000    Dev_Roof-All-All-All   1      21.112313      0.010000       100.000000
        6665    10000   Dev_Overspray-All-All-All     1       0.347450       0.010000       100.000000
        6665    11111   Dev_Irrigated-A-Low-Confined  2       0.000000       0.010000       400.000000
        6665    11112   Dev_Irrigated-A-Low-Unconfined       2       0.000000       0.010000       400.000000
        6665    11121   Dev_Irrigated-A-Med-Confined  2       0.000000       0.010000       300.000000
        6665    11122   Dev_Irrigated-A-Med-Unconfined       2       0.000000       0.010000       300.000000
        6665    11211   Dev_Irrigated-B-Low-Confined  2       0.000000       0.010000       400.000000
        6665    11212   Dev_Irrigated-B-Low-Unconfined       2       0.000000       0.010000       400.000000
        6665    11221   Dev_Irrigated-B-Med-Confined  2       0.000000       0.010000       300.000000
        6665    11222   Dev_Irrigated-B-Med-Unconfined       2       0.000000       0.010000       300.000000
        6665    11311   Dev_Irrigated-C-Low-Confined  2       0.000000       0.010000       400.000000
        6665    11312   Dev_Irrigated-C-Low-Unconfined       2       0.000000       0.010000       400.000000
        6665    11321   Dev_Irrigated-C-Med-Confined  2       0.000000       0.010000       300.000000
        6665    11322   Dev_Irrigated-C-Med-Unconfined       2       0.000000       0.010000       300.000000
```

| | | | | | | |
|---|---|---|---|---|---|---|
| 6665 | 11411 | Dev_Irrigated-D-Low-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6665 | 11412 | Dev_Irrigated-D-Low-Unconfined | 2 | 1.510911 | 0.010000 | 400.000000 |
| 6665 | 11421 | Dev_Irrigated-D-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6665 | 11422 | Dev_Irrigated-D-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6665 | 12111 | Dev_Pervious-A-Low-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6665 | 12112 | Dev_Pervious-A-Low-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6665 | 12121 | Dev_Pervious-A-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6665 | 12122 | Dev_Pervious-A-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6665 | 12211 | Dev_Pervious-B-Low-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6665 | 12212 | Dev_Pervious-B-Low-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6665 | 12221 | Dev_Pervious-B-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6665 | 12222 | Dev_Pervious-B-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6665 | 12311 | Dev_Pervious-C-Low-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6665 | 12312 | Dev_Pervious-C-Low-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6665 | 12321 | Dev_Pervious-C-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6665 | 12322 | Dev_Pervious-C-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6665 | 12411 | Dev_Pervious-D-Low-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6665 | 12412 | Dev_Pervious-D-Low-Unconfined | 2 | 4.317925 | 0.010000 | 400.000000 |
| 6665 | 12421 | Dev_Pervious-D-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6665 | 12422 | Dev_Pervious-D-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6665 | 13111 | Agriculture-A-Low-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6665 | 13112 | Agriculture-A-Low-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6665 | 13121 | Agriculture-A-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6665 | 13122 | Agriculture-A-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6665 | 13211 | Agriculture-B-Low-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6665 | 13212 | Agriculture-B-Low-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6665 | 13221 | Agriculture-B-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6665 | 13222 | Agriculture-B-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6665 | 13231 | Agriculture-B-High-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6665 | 13232 | Agriculture-B-High-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6665 | 13311 | Agriculture-C-Low-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6665 | 13312 | Agriculture-C-Low-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6665 | 13321 | Agriculture-C-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6665 | 13322 | Agriculture-C-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6665 | 13331 | Agriculture-C-High-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6665 | 13411 | Agriculture-D-Low-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6665 | 13412 | Agriculture-D-Low-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6665 | 13421 | Agriculture-D-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6665 | 13422 | Agriculture-D-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6665 | 13431 | Agriculture-D-High-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6665 | 13432 | Agriculture-D-High-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6665 | 14121 | Veg_Low-A-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6665 | 14122 | Veg_Low-A-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6665 | 14131 | Veg_Low-A-High-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6665 | 14132 | Veg_Low-A-High-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6665 | 14221 | Veg_Low-B-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6665 | 14222 | Veg_Low-B-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6665 | 14231 | Veg_Low-B-High-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6665 | 14232 | Veg_Low-B-High-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6665 | 14321 | Veg_Low-C-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6665 | 14322 | Veg_Low-C-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6665 | 14331 | Veg_Low-C-High-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6665 | 14332 | Veg_Low-C-High-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6665 | 14421 | Veg_Low-D-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6665 | 14422 | Veg_Low-D-Med-Unconfined | 2 | 3.304589 | 0.010000 | 300.000000 |
| 6665 | 14431 | Veg_Low-D-High-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6665 | 14432 | Veg_Low-D-High-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6665 | 15121 | Veg_High-A-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6665 | 15122 | Veg_High-A-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6665 | 15131 | Veg_High-A-High-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6665 | 15132 | Veg_High-A-High-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6665 | 15221 | Veg_High-B-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6665 | 15222 | Veg_High-B-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6665 | 15231 | Veg_High-B-High-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6665 | 15232 | Veg_High-B-High-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6665 | 15321 | Veg_High-C-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6665 | 15322 | Veg_High-C-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6665 | 15331 | Veg_High-C-High-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6665 | 15332 | Veg_High-C-High-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6665 | 15421 | Veg_High-D-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6665 | 15422 | Veg_High-D-Med-Unconfined | 2 | 12.946617 | 0.010000 | 300.000000 |
| 6665 | 15431 | Veg_High-D-High-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6665 | 15432 | Veg_High-D-High-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6665 | 16000 | Water-All-All-All | 1 | 0.000000 | 0.010000 | 100.000000 |
| 6671 | 1000 | Road_Freeway-All-All-All | 1 | 0.000000 | 0.010000 | 100.000000 |
| 6671 | 2000 | Road_Primary-All-All-All | 1 | 2.312761 | 0.010000 | 100.000000 |
| 6671 | 3000 | Road_Minor-All-All-All | 1 | 0.904067 | 0.010000 | 100.000000 |
| 6671 | 4000 | Dev_ResHigh-All-All-All | 1 | 1.247810 | 0.010000 | 100.000000 |
| 6671 | 5000 | Dev_ResLow-All-All-All | 1 | 5.720340 | 0.010000 | 100.000000 |

| | | | | | | |
|---|---|---|---|---|---|---|
| 6671 | 6000 | Dev_Com-All-All-All | 1 | 1.113389 | 0.010000 | 100.000000 |
| 6671 | 7000 | Dev_Ind-All-All-All | 1 | 0.000163 | 0.010000 | 100.000000 |
| 6671 | 8000 | Dev_Inst-All-All-All | 1 | 0.736398 | 0.010000 | 100.000000 |
| 6671 | 9000 | Dev_Roof-All-All-All | 1 | 11.268195 | 0.010000 | 100.000000 |
| 6671 | 10000 | Dev_Overspray-All-All-All | 1 | 0.320635 | 0.010000 | 100.000000 |
| 6671 | 11111 | Dev_Irrigated-A-Low-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6671 | 11112 | Dev_Irrigated-A-Low-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6671 | 11121 | Dev_Irrigated-A-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6671 | 11122 | Dev_Irrigated-A-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6671 | 11211 | Dev_Irrigated-B-Low-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6671 | 11212 | Dev_Irrigated-B-Low-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6671 | 11221 | Dev_Irrigated-B-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6671 | 11222 | Dev_Irrigated-B-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6671 | 11311 | Dev_Irrigated-C-Low-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6671 | 11312 | Dev_Irrigated-C-Low-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6671 | 11321 | Dev_Irrigated-C-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6671 | 11322 | Dev_Irrigated-C-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6671 | 11411 | Dev_Irrigated-D-Low-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6671 | 11412 | Dev_Irrigated-D-Low-Unconfined | 2 | 0.417402 | 0.010000 | 400.000000 |
| 6671 | 11421 | Dev_Irrigated-D-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6671 | 11422 | Dev_Irrigated-D-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6671 | 12111 | Dev_Pervious-A-Low-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6671 | 12112 | Dev_Pervious-A-Low-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6671 | 12121 | Dev_Pervious-A-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6671 | 12122 | Dev_Pervious-A-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6671 | 12211 | Dev_Pervious-B-Low-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6671 | 12212 | Dev_Pervious-B-Low-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6671 | 12221 | Dev_Pervious-B-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6671 | 12222 | Dev_Pervious-B-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6671 | 12311 | Dev_Pervious-C-Low-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6671 | 12312 | Dev_Pervious-C-Low-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6671 | 12321 | Dev_Pervious-C-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6671 | 12322 | Dev_Pervious-C-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6671 | 12411 | Dev_Pervious-D-Low-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6671 | 12412 | Dev_Pervious-D-Low-Unconfined | 2 | 1.110206 | 0.010000 | 400.000000 |
| 6671 | 12421 | Dev_Pervious-D-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6671 | 12422 | Dev_Pervious-D-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6671 | 13111 | Agriculture-A-Low-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6671 | 13112 | Agriculture-A-Low-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6671 | 13121 | Agriculture-A-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6671 | 13122 | Agriculture-A-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6671 | 13211 | Agriculture-B-Low-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6671 | 13212 | Agriculture-B-Low-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6671 | 13221 | Agriculture-B-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6671 | 13222 | Agriculture-B-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6671 | 13231 | Agriculture-B-High-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6671 | 13232 | Agriculture-B-High-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6671 | 13311 | Agriculture-C-Low-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6671 | 13312 | Agriculture-C-Low-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6671 | 13321 | Agriculture-C-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6671 | 13322 | Agriculture-C-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6671 | 13331 | Agriculture-C-High-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6671 | 13411 | Agriculture-D-Low-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6671 | 13412 | Agriculture-D-Low-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6671 | 13421 | Agriculture-D-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6671 | 13422 | Agriculture-D-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6671 | 13431 | Agriculture-D-High-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6671 | 13432 | Agriculture-D-High-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6671 | 14121 | Veg_Low-A-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6671 | 14122 | Veg_Low-A-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6671 | 14131 | Veg_Low-A-High-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6671 | 14132 | Veg_Low-A-High-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6671 | 14221 | Veg_Low-B-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6671 | 14222 | Veg_Low-B-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6671 | 14231 | Veg_Low-B-High-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6671 | 14232 | Veg_Low-B-High-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6671 | 14321 | Veg_Low-C-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6671 | 14322 | Veg_Low-C-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6671 | 14331 | Veg_Low-C-High-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6671 | 14332 | Veg_Low-C-High-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6671 | 14421 | Veg_Low-D-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6671 | 14422 | Veg_Low-D-Med-Unconfined | 2 | 2.005914 | 0.010000 | 300.000000 |
| 6671 | 14431 | Veg_Low-D-High-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6671 | 14432 | Veg_Low-D-High-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6671 | 15121 | Veg_High-A-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6671 | 15122 | Veg_High-A-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6671 | 15131 | Veg_High-A-High-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6671 | 15132 | Veg_High-A-High-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6671 | 15221 | Veg_High-B-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |

|  |  |  |  |  |  |  |
|---|---|---|---|---|---|---|
| 6671 | 15222 | Veg_High-B-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6671 | 15231 | Veg_High-B-High-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6671 | 15232 | Veg_High-B-High-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6671 | 15321 | Veg_High-C-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6671 | 15322 | Veg_High-C-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6671 | 15331 | Veg_High-C-High-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6671 | 15332 | Veg_High-C-High-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6671 | 15421 | Veg_High-D-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6671 | 15422 | Veg_High-D-Med-Unconfined | 2 | 4.574342 | 0.010000 | 300.000000 |
| 6671 | 15431 | Veg_High-D-High-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6671 | 15432 | Veg_High-D-High-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6671 | 16000 | Water-All-All-All | 1 | 0.000000 | 0.010000 | 100.000000 |
| 6673 | 1000 | Road_Freeway-All-All-All | 1 | 0.000000 | 0.010000 | 100.000000 |
| 6673 | 2000 | Road_Primary-All-All-All | 1 | 0.481529 | 0.010000 | 100.000000 |
| 6673 | 3000 | Road_Minor-All-All-All | 1 | 2.956772 | 0.010000 | 100.000000 |
| 6673 | 4000 | Dev_ResHigh-All-All-All | 1 | 0.000000 | 0.010000 | 100.000000 |
| 6673 | 5000 | Dev_ResLow-All-All-All | 1 | 0.000000 | 0.010000 | 100.000000 |
| 6673 | 6000 | Dev_Com-All-All-All | 1 | 1.290964 | 0.010000 | 100.000000 |
| 6673 | 7000 | Dev_Ind-All-All-All | 1 | 6.885027 | 0.010000 | 100.000000 |
| 6673 | 8000 | Dev_Inst-All-All-All | 1 | 4.118302 | 0.010000 | 100.000000 |
| 6673 | 9000 | Dev_Roof-All-All-All | 1 | 6.831145 | 0.010000 | 100.000000 |
| 6673 | 10000 | Dev_Overspray-All-All-All | 1 | 0.053652 | 0.010000 | 100.000000 |
| 6673 | 11111 | Dev_Irrigated-A-Low-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6673 | 11112 | Dev_Irrigated-A-Low-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6673 | 11121 | Dev_Irrigated-A-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6673 | 11122 | Dev_Irrigated-A-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6673 | 11211 | Dev_Irrigated-B-Low-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6673 | 11212 | Dev_Irrigated-B-Low-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6673 | 11221 | Dev_Irrigated-B-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6673 | 11222 | Dev_Irrigated-B-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6673 | 11311 | Dev_Irrigated-C-Low-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6673 | 11312 | Dev_Irrigated-C-Low-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6673 | 11321 | Dev_Irrigated-C-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6673 | 11322 | Dev_Irrigated-C-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6673 | 11411 | Dev_Irrigated-D-Low-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6673 | 11412 | Dev_Irrigated-D-Low-Unconfined | 2 | 0.074199 | 0.010000 | 400.000000 |
| 6673 | 11421 | Dev_Irrigated-D-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6673 | 11422 | Dev_Irrigated-D-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6673 | 12111 | Dev_Pervious-A-Low-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6673 | 12112 | Dev_Pervious-A-Low-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6673 | 12121 | Dev_Pervious-A-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6673 | 12122 | Dev_Pervious-A-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6673 | 12211 | Dev_Pervious-B-Low-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6673 | 12212 | Dev_Pervious-B-Low-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6673 | 12221 | Dev_Pervious-B-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6673 | 12222 | Dev_Pervious-B-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6673 | 12311 | Dev_Pervious-C-Low-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6673 | 12312 | Dev_Pervious-C-Low-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6673 | 12321 | Dev_Pervious-C-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6673 | 12322 | Dev_Pervious-C-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6673 | 12411 | Dev_Pervious-D-Low-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6673 | 12412 | Dev_Pervious-D-Low-Unconfined | 2 | 0.203030 | 0.010000 | 400.000000 |
| 6673 | 12421 | Dev_Pervious-D-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6673 | 12422 | Dev_Pervious-D-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6673 | 13111 | Agriculture-A-Low-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6673 | 13112 | Agriculture-A-Low-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6673 | 13121 | Agriculture-A-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6673 | 13122 | Agriculture-A-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6673 | 13211 | Agriculture-B-Low-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6673 | 13212 | Agriculture-B-Low-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6673 | 13221 | Agriculture-B-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6673 | 13222 | Agriculture-B-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6673 | 13231 | Agriculture-B-High-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6673 | 13232 | Agriculture-B-High-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6673 | 13311 | Agriculture-C-Low-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6673 | 13312 | Agriculture-C-Low-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6673 | 13321 | Agriculture-C-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6673 | 13322 | Agriculture-C-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6673 | 13331 | Agriculture-C-High-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6673 | 13411 | Agriculture-D-Low-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6673 | 13412 | Agriculture-D-Low-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6673 | 13421 | Agriculture-D-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6673 | 13422 | Agriculture-D-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6673 | 13431 | Agriculture-D-High-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6673 | 13432 | Agriculture-D-High-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6673 | 14121 | Veg_Low-A-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6673 | 14122 | Veg_Low-A-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6673 | 14131 | Veg_Low-A-High-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6673 | 14132 | Veg_Low-A-High-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |

| | | | | | | |
|---|---|---|---|---|---|---|
| 6673 | 14221 | Veg_Low-B-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6673 | 14222 | Veg_Low-B-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6673 | 14231 | Veg_Low-B-High-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6673 | 14232 | Veg_Low-B-High-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6673 | 14321 | Veg_Low-C-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6673 | 14322 | Veg_Low-C-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6673 | 14331 | Veg_Low-C-High-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6673 | 14332 | Veg_Low-C-High-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6673 | 14421 | Veg_Low-D-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6673 | 14422 | Veg_Low-D-Med-Unconfined | 2 | 1.045365 | 0.010000 | 300.000000 |
| 6673 | 14431 | Veg_Low-D-High-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6673 | 14432 | Veg_Low-D-High-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6673 | 15121 | Veg_High-A-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6673 | 15122 | Veg_High-A-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6673 | 15131 | Veg_High-A-High-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6673 | 15132 | Veg_High-A-High-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6673 | 15221 | Veg_High-B-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6673 | 15222 | Veg_High-B-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6673 | 15231 | Veg_High-B-High-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6673 | 15232 | Veg_High-B-High-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6673 | 15321 | Veg_High-C-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6673 | 15322 | Veg_High-C-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6673 | 15331 | Veg_High-C-High-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6673 | 15332 | Veg_High-C-High-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6673 | 15421 | Veg_High-D-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6673 | 15422 | Veg_High-D-Med-Unconfined | 2 | 0.573705 | 0.010000 | 300.000000 |
| 6673 | 15431 | Veg_High-D-High-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6673 | 15432 | Veg_High-D-High-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6673 | 16000 | Water-All-All-All | 1 | 0.000000 | 0.010000 | 100.000000 |
| 6674 | 1000 | Road_Freeway-All-All-All | 1 | 0.000000 | 0.010000 | 100.000000 |
| 6674 | 2000 | Road_Primary-All-All-All | 1 | 2.925525 | 0.010000 | 100.000000 |
| 6674 | 3000 | Road_Minor-All-All-All | 1 | 0.614918 | 0.010000 | 100.000000 |
| 6674 | 4000 | Dev_ResHigh-All-All-All | 1 | 0.000000 | 0.010000 | 100.000000 |
| 6674 | 5000 | Dev_ResLow-All-All-All | 1 | 0.000000 | 0.010000 | 100.000000 |
| 6674 | 6000 | Dev_Com-All-All-All | 1 | 2.889121 | 0.010000 | 100.000000 |
| 6674 | 7000 | Dev_Ind-All-All-All | 1 | 0.000000 | 0.010000 | 100.000000 |
| 6674 | 8000 | Dev_Inst-All-All-All | 1 | 0.000000 | 0.010000 | 100.000000 |
| 6674 | 9000 | Dev_Roof-All-All-All | 1 | 6.797795 | 0.010000 | 100.000000 |
| 6674 | 10000 | Dev_Overspray-All-All-All | 1 | 0.098764 | 0.010000 | 100.000000 |
| 6674 | 11111 | Dev_Irrigated-A-Low-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6674 | 11112 | Dev_Irrigated-A-Low-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6674 | 11121 | Dev_Irrigated-A-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6674 | 11122 | Dev_Irrigated-A-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6674 | 11211 | Dev_Irrigated-B-Low-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6674 | 11212 | Dev_Irrigated-B-Low-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6674 | 11221 | Dev_Irrigated-B-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6674 | 11222 | Dev_Irrigated-B-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6674 | 11311 | Dev_Irrigated-C-Low-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6674 | 11312 | Dev_Irrigated-C-Low-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6674 | 11321 | Dev_Irrigated-C-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6674 | 11322 | Dev_Irrigated-C-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6674 | 11411 | Dev_Irrigated-D-Low-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6674 | 11412 | Dev_Irrigated-D-Low-Unconfined | 2 | 0.029689 | 0.010000 | 400.000000 |
| 6674 | 11421 | Dev_Irrigated-D-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6674 | 11422 | Dev_Irrigated-D-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6674 | 12111 | Dev_Pervious-A-Low-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6674 | 12112 | Dev_Pervious-A-Low-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6674 | 12121 | Dev_Pervious-A-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6674 | 12122 | Dev_Pervious-A-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6674 | 12211 | Dev_Pervious-B-Low-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6674 | 12212 | Dev_Pervious-B-Low-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6674 | 12221 | Dev_Pervious-B-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6674 | 12222 | Dev_Pervious-B-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6674 | 12311 | Dev_Pervious-C-Low-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6674 | 12312 | Dev_Pervious-C-Low-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6674 | 12321 | Dev_Pervious-C-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6674 | 12322 | Dev_Pervious-C-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6674 | 12411 | Dev_Pervious-D-Low-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6674 | 12412 | Dev_Pervious-D-Low-Unconfined | 2 | 0.067237 | 0.010000 | 400.000000 |
| 6674 | 12421 | Dev_Pervious-D-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6674 | 12422 | Dev_Pervious-D-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6674 | 13111 | Agriculture-A-Low-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6674 | 13112 | Agriculture-A-Low-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6674 | 13121 | Agriculture-A-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6674 | 13122 | Agriculture-A-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6674 | 13211 | Agriculture-B-Low-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6674 | 13212 | Agriculture-B-Low-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6674 | 13221 | Agriculture-B-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6674 | 13222 | Agriculture-B-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |

| | | | | | | |
|---|---|---|---|---|---|---|
| 6674 | 13231 | Agriculture-B-High-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6674 | 13232 | Agriculture-B-High-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6674 | 13311 | Agriculture-C-Low-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6674 | 13312 | Agriculture-C-Low-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6674 | 13321 | Agriculture-C-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6674 | 13322 | Agriculture-C-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6674 | 13331 | Agriculture-C-High-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6674 | 13411 | Agriculture-D-Low-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6674 | 13412 | Agriculture-D-Low-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6674 | 13421 | Agriculture-D-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6674 | 13422 | Agriculture-D-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6674 | 13431 | Agriculture-D-High-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6674 | 13432 | Agriculture-D-High-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6674 | 14121 | Veg_Low-A-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6674 | 14122 | Veg_Low-A-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6674 | 14131 | Veg_Low-A-High-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6674 | 14132 | Veg_Low-A-High-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6674 | 14221 | Veg_Low-B-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6674 | 14222 | Veg_Low-B-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6674 | 14231 | Veg_Low-B-High-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6674 | 14232 | Veg_Low-B-High-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6674 | 14321 | Veg_Low-C-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6674 | 14322 | Veg_Low-C-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6674 | 14331 | Veg_Low-C-High-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6674 | 14332 | Veg_Low-C-High-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6674 | 14421 | Veg_Low-D-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6674 | 14422 | Veg_Low-D-Med-Unconfined | 2 | 0.499460 | 0.010000 | 300.000000 |
| 6674 | 14431 | Veg_Low-D-High-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6674 | 14432 | Veg_Low-D-High-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6674 | 15121 | Veg_High-A-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6674 | 15122 | Veg_High-A-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6674 | 15131 | Veg_High-A-High-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6674 | 15132 | Veg_High-A-High-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6674 | 15221 | Veg_High-B-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6674 | 15222 | Veg_High-B-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6674 | 15231 | Veg_High-B-High-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6674 | 15232 | Veg_High-B-High-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6674 | 15321 | Veg_High-C-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6674 | 15322 | Veg_High-C-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6674 | 15331 | Veg_High-C-High-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6674 | 15332 | Veg_High-C-High-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6674 | 15421 | Veg_High-D-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6674 | 15422 | Veg_High-D-Med-Unconfined | 2 | 0.817424 | 0.010000 | 300.000000 |
| 6674 | 15431 | Veg_High-D-High-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6674 | 15432 | Veg_High-D-High-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6674 | 16000 | Water-All-All-All | 1 | 0.000000 | 0.010000 | 100.000000 |
| 6675 | 1000 | Road_Freeway-All-All-All | 1 | 0.000000 | 0.010000 | 100.000000 |
| 6675 | 2000 | Road_Primary-All-All-All | 1 | 1.937187 | 0.010000 | 100.000000 |
| 6675 | 3000 | Road_Minor-All-All-All | 1 | 0.156881 | 0.010000 | 100.000000 |
| 6675 | 4000 | Dev_ResHigh-All-All-All | 1 | 0.736092 | 0.010000 | 100.000000 |
| 6675 | 5000 | Dev_ResLow-All-All-All | 1 | 0.000000 | 0.010000 | 100.000000 |
| 6675 | 6000 | Dev_Com-All-All-All | 1 | 0.439377 | 0.010000 | 100.000000 |
| 6675 | 7000 | Dev_Ind-All-All-All | 1 | 0.000000 | 0.010000 | 100.000000 |
| 6675 | 8000 | Dev_Inst-All-All-All | 1 | 0.941816 | 0.010000 | 100.000000 |
| 6675 | 9000 | Dev_Roof-All-All-All | 1 | 3.077462 | 0.010000 | 100.000000 |
| 6675 | 10000 | Dev_Overspray-All-All-All | 1 | 0.041320 | 0.010000 | 100.000000 |
| 6675 | 11111 | Dev_Irrigated-A-Low-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6675 | 11112 | Dev_Irrigated-A-Low-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6675 | 11121 | Dev_Irrigated-A-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6675 | 11122 | Dev_Irrigated-A-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6675 | 11211 | Dev_Irrigated-B-Low-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6675 | 11212 | Dev_Irrigated-B-Low-Unconfined | 2 | 0.000000 | 0.040000 | 400.000000 |
| 6675 | 11221 | Dev_Irrigated-B-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6675 | 11222 | Dev_Irrigated-B-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6675 | 11311 | Dev_Irrigated-C-Low-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6675 | 11312 | Dev_Irrigated-C-Low-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6675 | 11321 | Dev_Irrigated-C-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6675 | 11322 | Dev_Irrigated-C-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6675 | 11411 | Dev_Irrigated-D-Low-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6675 | 11412 | Dev_Irrigated-D-Low-Unconfined | 2 | 0.181499 | 0.010000 | 400.000000 |
| 6675 | 11421 | Dev_Irrigated-D-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6675 | 11422 | Dev_Irrigated-D-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6675 | 12111 | Dev_Pervious-A-Low-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6675 | 12112 | Dev_Pervious-A-Low-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6675 | 12121 | Dev_Pervious-A-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6675 | 12122 | Dev_Pervious-A-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6675 | 12211 | Dev_Pervious-B-Low-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6675 | 12212 | Dev_Pervious-B-Low-Unconfined | 2 | 0.000000 | 0.040000 | 400.000000 |
| 6675 | 12221 | Dev_Pervious-B-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |

| | | | | | | |
|---|---|---|---|---|---|---|
| 6675 | 12222 | Dev_Pervious-B-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6675 | 12311 | Dev_Pervious-C-Low-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6675 | 12312 | Dev_Pervious-C-Low-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6675 | 12321 | Dev_Pervious-C-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6675 | 12322 | Dev_Pervious-C-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6675 | 12411 | Dev_Pervious-D-Low-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6675 | 12412 | Dev_Pervious-D-Low-Unconfined | 2 | 0.451767 | 0.010000 | 400.000000 |
| 6675 | 12421 | Dev_Pervious-D-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6675 | 12422 | Dev_Pervious-D-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6675 | 13111 | Agriculture-A-Low-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6675 | 13112 | Agriculture-A-Low-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6675 | 13121 | Agriculture-A-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6675 | 13122 | Agriculture-A-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6675 | 13211 | Agriculture-B-Low-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6675 | 13212 | Agriculture-B-Low-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6675 | 13221 | Agriculture-B-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6675 | 13222 | Agriculture-B-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6675 | 13231 | Agriculture-B-High-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6675 | 13232 | Agriculture-B-High-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6675 | 13311 | Agriculture-C-Low-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6675 | 13312 | Agriculture-C-Low-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6675 | 13321 | Agriculture-C-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6675 | 13322 | Agriculture-C-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6675 | 13331 | Agriculture-C-High-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6675 | 13411 | Agriculture-D-Low-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6675 | 13412 | Agriculture-D-Low-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6675 | 13421 | Agriculture-D-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6675 | 13422 | Agriculture-D-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6675 | 13431 | Agriculture-D-High-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6675 | 13432 | Agriculture-D-High-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6675 | 14121 | Veg_Low-A-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6675 | 14122 | Veg_Low-A-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6675 | 14131 | Veg_Low-A-High-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6675 | 14132 | Veg_Low-A-High-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6675 | 14221 | Veg_Low-B-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6675 | 14222 | Veg_Low-B-Med-Unconfined | 2 | 0.000000 | 0.020000 | 300.000000 |
| 6675 | 14231 | Veg_Low-B-High-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6675 | 14232 | Veg_Low-B-High-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6675 | 14321 | Veg_Low-C-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6675 | 14322 | Veg_Low-C-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6675 | 14331 | Veg_Low-C-High-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6675 | 14332 | Veg_Low-C-High-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6675 | 14421 | Veg_Low-D-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6675 | 14422 | Veg_Low-D-Med-Unconfined | 2 | 0.285731 | 0.010000 | 300.000000 |
| 6675 | 14431 | Veg_Low-D-High-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6675 | 14432 | Veg_Low-D-High-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6675 | 15121 | Veg_High-A-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6675 | 15122 | Veg_High-A-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6675 | 15131 | Veg_High-A-High-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6675 | 15132 | Veg_High-A-High-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6675 | 15221 | Veg_High-B-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6675 | 15222 | Veg_High-B-Med-Unconfined | 2 | 0.000000 | 0.020000 | 300.000000 |
| 6675 | 15231 | Veg_High-B-High-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6675 | 15232 | Veg_High-B-High-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6675 | 15321 | Veg_High-C-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6675 | 15322 | Veg_High-C-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6675 | 15331 | Veg_High-C-High-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6675 | 15332 | Veg_High-C-High-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6675 | 15421 | Veg_High-D-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6675 | 15422 | Veg_High-D-Med-Unconfined | 2 | 1.242093 | 0.010000 | 300.000000 |
| 6675 | 15431 | Veg_High-D-High-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6675 | 15432 | Veg_High-D-High-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6675 | 16000 | Water-All-All-All | 1 | 0.000000 | 0.010000 | 100.000000 |
| 6684 | 1000 | Road_Freeway-All-All-All | 1 | 0.000000 | 0.010000 | 100.000000 |
| 6684 | 2000 | Road_Primary-All-All-All | 1 | 0.139605 | 0.010000 | 100.000000 |
| 6684 | 3000 | Road_Minor-All-All-All | 1 | 0.000000 | 0.010000 | 100.000000 |
| 6684 | 4000 | Dev_ResHigh-All-All-All | 1 | 0.000000 | 0.010000 | 100.000000 |
| 6684 | 5000 | Dev_ResLow-All-All-All | 1 | 0.739849 | 0.010000 | 100.000000 |
| 6684 | 6000 | Dev_Com-All-All-All | 1 | 0.000000 | 0.010000 | 100.000000 |
| 6684 | 7000 | Dev_Ind-All-All-All | 1 | 0.000000 | 0.010000 | 100.000000 |
| 6684 | 8000 | Dev_Inst-All-All-All | 1 | 0.166684 | 0.010000 | 100.000000 |
| 6684 | 9000 | Dev_Roof-All-All-All | 1 | 0.712684 | 0.010000 | 100.000000 |
| 6684 | 10000 | Dev_Overspray-All-All-All | 1 | 0.029787 | 0.010000 | 100.000000 |
| 6684 | 11111 | Dev_Irrigated-A-Low-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6684 | 11112 | Dev_Irrigated-A-Low-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6684 | 11121 | Dev_Irrigated-A-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6684 | 11122 | Dev_Irrigated-A-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6684 | 11211 | Dev_Irrigated-B-Low-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6684 | 11212 | Dev_Irrigated-B-Low-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |

```
6684    11221   Dev_Irrigated-B-Med-Confined  2       0.000000        0.010000        300.000000
6684    11222   Dev_Irrigated-B-Med-Unconfined        2       0.000000        0.010000        300.000000
6684    11311   Dev_Irrigated-C-Low-Confined  2       0.000000        0.010000        400.000000
6684    11312   Dev_Irrigated-C-Low-Unconfined        2       0.000000        0.010000        400.000000
6684    11321   Dev_Irrigated-C-Med-Confined  2       0.000000        0.010000        300.000000
6684    11322   Dev_Irrigated-C-Med-Unconfined        2       0.000000        0.010000        300.000000
6684    11411   Dev_Irrigated-D-Low-Confined  2       0.000000        0.010000        400.000000
6684    11412   Dev_Irrigated-D-Low-Unconfined        2       0.059527        0.010000        400.000000
6684    11421   Dev_Irrigated-D-Med-Confined  2       0.000000        0.010000        300.000000
6684    11422   Dev_Irrigated-D-Med-Unconfined        2       0.000000        0.010000        300.000000
6684    12111   Dev_Pervious-A-Low-Confined   2       0.000000        0.010000        400.000000
6684    12112   Dev_Pervious-A-Low-Unconfined 2       0.000000        0.010000        400.000000
6684    12121   Dev_Pervious-A-Med-Confined   2       0.000000        0.010000        300.000000
6684    12122   Dev_Pervious-A-Med-Unconfined 2       0.000000        0.010000        300.000000
6684    12211   Dev_Pervious-B-Low-Confined   2       0.000000        0.010000        400.000000
6684    12212   Dev_Pervious-B-Low-Unconfined 2       0.000000        0.010000        400.000000
6684    12221   Dev_Pervious-B-Med-Confined   2       0.000000        0.010000        300.000000
6684    12222   Dev_Pervious-B-Med-Unconfined 2       0.000000        0.010000        300.000000
6684    12311   Dev_Pervious-C-Low-Confined   2       0.000000        0.010000        400.000000
6684    12312   Dev_Pervious-C-Low-Unconfined 2       0.000000        0.010000        400.000000
6684    12321   Dev_Pervious-C-Med-Confined   2       0.000000        0.010000        300.000000
6684    12322   Dev_Pervious-C-Med-Unconfined 2       0.000000        0.010000        300.000000
6684    12411   Dev_Pervious-D-Low-Confined   2       0.000000        0.010000        400.000000
6684    12412   Dev_Pervious-D-Low-Unconfined 2       0.195329        0.010000        400.000000
6684    12421   Dev_Pervious-D-Med-Confined   2       0.000000        0.010000        300.000000
6684    12422   Dev_Pervious-D-Med-Unconfined 2       0.000000        0.010000        300.000000
6684    13111   Agriculture-A-Low-Confined    2       0.000000        0.010000        400.000000
6684    13112   Agriculture-A-Low-Unconfined  2       0.000000        0.010000        400.000000
6684    13121   Agriculture-A-Med-Confined    2       0.000000        0.010000        300.000000
6684    13122   Agriculture-A-Med-Unconfined  2       0.000000        0.010000        300.000000
6684    13211   Agriculture-B-Low-Confined    2       0.000000        0.010000        400.000000
6684    13212   Agriculture-B-Low-Unconfined  2       0.000000        0.010000        400.000000
6684    13221   Agriculture-B-Med-Confined    2       0.000000        0.010000        300.000000
6684    13222   Agriculture-B-Med-Unconfined  2       0.000000        0.010000        300.000000
6684    13231   Agriculture-B-High-Confined   2       0.000000        0.010000        400.000000
6684    13232   Agriculture-B-High-Unconfined 2       0.000000        0.010000        400.000000
6684    13311   Agriculture-C-Low-Confined    2       0.000000        0.010000        400.000000
6684    13312   Agriculture-C-Low-Unconfined  2       0.000000        0.010000        400.000000
6684    13321   Agriculture-C-Med-Confined    2       0.000000        0.010000        300.000000
6684    13322   Agriculture-C-Med-Unconfined  2       0.000000        0.010000        300.000000
6684    13331   Agriculture-C-High-Confined   2       0.000000        0.010000        400.000000
6684    13411   Agriculture-D-Low-Confined    2       0.000000        0.010000        400.000000
6684    13412   Agriculture-D-Low-Unconfined  2       0.000000        0.010000        400.000000
6684    13421   Agriculture-D-Med-Confined    2       0.000000        0.010000        300.000000
6684    13422   Agriculture-D-Med-Unconfined  2       0.000000        0.010000        300.000000
6684    13431   Agriculture-D-High-Confined   2       0.000000        0.010000        400.000000
6684    13432   Agriculture-D-High-Unconfined 2       0.000000        0.010000        400.000000
6684    14121   Veg_Low-A-Med-Confined 2      0.000000        0.010000        300.000000
6684    14122   Veg_Low-A-Med-Unconfined      2       0.000000        0.010000        300.000000
6684    14131   Veg_Low-A-High-Confined       2       0.000000        0.010000        400.000000
6684    14132   Veg_Low-A-High-Unconfined     2       0.000000        0.010000        400.000000
6684    14221   Veg_Low-B-Med-Confined 2      0.000000        0.010000        300.000000
6684    14222   Veg_Low-B-Med-Unconfined      2       0.000000        0.010000        300.000000
6684    14231   Veg_Low-B-High-Confined       2       0.000000        0.010000        400.000000
6684    14232   Veg_Low-B-High-Unconfined     2       0.000000        0.010000        400.000000
6684    14321   Veg_Low-C-Med-Confined 2      0.000000        0.010000        300.000000
6684    14322   Veg_Low-C-Med-Unconfined      2       0.000000        0.010000        300.000000
6684    14331   Veg_Low-C-High-Confined       2       0.000000        0.010000        400.000000
6684    14332   Veg_Low-C-High-Unconfined     2       0.000000        0.010000        400.000000
6684    14421   Veg_Low-D-Med-Confined 2      0.000000        0.010000        300.000000
6684    14422   Veg_Low-D-Med-Unconfined      2       0.396905        0.010000        300.000000
6684    14431   Veg_Low-D-High-Confined       2       0.000000        0.010000        400.000000
6684    14432   Veg_Low-D-High-Unconfined     2       0.000000        0.010000        400.000000
6684    15121   Veg_High-A-Med-Confined       2       0.000000        0.010000        300.000000
6684    15122   Veg_High-A-Med-Unconfined     2       0.000000        0.010000        300.000000
6684    15131   Veg_High-A-High-Confined      2       0.000000        0.010000        400.000000
6684    15132   Veg_High-A-High-Unconfined    2       0.000000        0.010000        400.000000
6684    15221   Veg_High-B-Med-Confined       2       0.000000        0.010000        300.000000
6684    15222   Veg_High-B-Med-Unconfined     2       0.000000        0.010000        300.000000
6684    15231   Veg_High-B-High-Confined      2       0.000000        0.010000        400.000000
6684    15232   Veg_High-B-High-Unconfined    2       0.000000        0.010000        400.000000
6684    15321   Veg_High-C-Med-Confined       2       0.000000        0.010000        300.000000
6684    15322   Veg_High-C-Med-Unconfined     2       0.000000        0.010000        300.000000
6684    15331   Veg_High-C-High-Confined      2       0.000000        0.010000        400.000000
6684    15332   Veg_High-C-High-Unconfined    2       0.000000        0.010000        400.000000
6684    15421   Veg_High-D-Med-Confined       2       0.000000        0.010000        300.000000
6684    15422   Veg_High-D-Med-Unconfined     2       0.628041        0.010000        300.000000
6684    15431   Veg_High-D-High-Confined      2       0.000000        0.010000        400.000000
6684    15432   Veg_High-D-High-Unconfined    2       0.000000        0.010000        400.000000
```

| | | | | | | |
|---|---|---|---|---|---|---|
| 6684 | 16000 | Water-All-All-All | 1 | 0.000000 | 0.010000 | 100.000000 |
| 6839 | 1000 | Road_Freeway-All-All-All | 1 | 0.000000 | 0.010000 | 100.000000 |
| 6839 | 2000 | Road_Primary-All-All-All | 1 | 12.914056 | 0.010000 | 100.000000 |
| 6839 | 3000 | Road_Minor-All-All-All | 1 | 22.882187 | 0.010000 | 100.000000 |
| 6839 | 4000 | Dev_ResHigh-All-All-All | 1 | 4.661385 | 0.010000 | 100.000000 |
| 6839 | 5000 | Dev_ResLow-All-All-All | 1 | 25.629873 | 0.010000 | 100.000000 |
| 6839 | 6000 | Dev_Com-All-All-All | 1 | 6.709273 | 0.010000 | 100.000000 |
| 6839 | 7000 | Dev_Ind-All-All-All | 1 | 0.006919 | 0.010000 | 100.000000 |
| 6839 | 8000 | Dev_Inst-All-All-All | 1 | 6.110366 | 0.010000 | 100.000000 |
| 6839 | 9000 | Dev_Roof-All-All-All | 1 | 69.593855 | 0.010000 | 100.000000 |
| 6839 | 10000 | Dev_Overspray-All-All-All | 1 | 1.549902 | 0.010000 | 100.000000 |
| 6839 | 11111 | Dev_Irrigated-A-Low-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6839 | 11112 | Dev_Irrigated-A-Low-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6839 | 11121 | Dev_Irrigated-A-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6839 | 11122 | Dev_Irrigated-A-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6839 | 11211 | Dev_Irrigated-B-Low-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6839 | 11212 | Dev_Irrigated-B-Low-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6839 | 11221 | Dev_Irrigated-B-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6839 | 11222 | Dev_Irrigated-B-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6839 | 11311 | Dev_Irrigated-C-Low-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6839 | 11312 | Dev_Irrigated-C-Low-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6839 | 11321 | Dev_Irrigated-C-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6839 | 11322 | Dev_Irrigated-C-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6839 | 11411 | Dev_Irrigated-D-Low-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6839 | 11412 | Dev_Irrigated-D-Low-Unconfined | 2 | 9.868122 | 0.010000 | 400.000000 |
| 6839 | 11421 | Dev_Irrigated-D-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6839 | 11422 | Dev_Irrigated-D-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6839 | 12111 | Dev_Pervious-A-Low-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6839 | 12112 | Dev_Pervious-A-Low-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6839 | 12121 | Dev_Pervious-A-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6839 | 12122 | Dev_Pervious-A-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6839 | 12211 | Dev_Pervious-B-Low-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6839 | 12212 | Dev_Pervious-B-Low-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6839 | 12221 | Dev_Pervious-B-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6839 | 12222 | Dev_Pervious-B-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6839 | 12311 | Dev_Pervious-C-Low-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6839 | 12312 | Dev_Pervious-C-Low-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6839 | 12321 | Dev_Pervious-C-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6839 | 12322 | Dev_Pervious-C-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6839 | 12411 | Dev_Pervious-D-Low-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6839 | 12412 | Dev_Pervious-D-Low-Unconfined | 2 | 27.470649 | 0.010000 | 400.000000 |
| 6839 | 12421 | Dev_Pervious-D-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6839 | 12422 | Dev_Pervious-D-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6839 | 13111 | Agriculture-A-Low-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6839 | 13112 | Agriculture-A-Low-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6839 | 13121 | Agriculture-A-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6839 | 13122 | Agriculture-A-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6839 | 13211 | Agriculture-B-Low-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6839 | 13212 | Agriculture-B-Low-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6839 | 13221 | Agriculture-B-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6839 | 13222 | Agriculture-B-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6839 | 13231 | Agriculture-B-High-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6839 | 13232 | Agriculture-B-High-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6839 | 13311 | Agriculture-C-Low-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6839 | 13312 | Agriculture-C-Low-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6839 | 13321 | Agriculture-C-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6839 | 13322 | Agriculture-C-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6839 | 13331 | Agriculture-C-High-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6839 | 13411 | Agriculture-D-Low-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6839 | 13412 | Agriculture-D-Low-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6839 | 13421 | Agriculture-D-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6839 | 13422 | Agriculture-D-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6839 | 13431 | Agriculture-D-High-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6839 | 13432 | Agriculture-D-High-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6839 | 14121 | Veg_Low-A-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6839 | 14122 | Veg_Low-A-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6839 | 14131 | Veg_Low-A-High-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6839 | 14132 | Veg_Low-A-High-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6839 | 14221 | Veg_Low-B-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6839 | 14222 | Veg_Low-B-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6839 | 14231 | Veg_Low-B-High-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6839 | 14232 | Veg_Low-B-High-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6839 | 14321 | Veg_Low-C-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6839 | 14322 | Veg_Low-C-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6839 | 14331 | Veg_Low-C-High-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6839 | 14332 | Veg_Low-C-High-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6839 | 14421 | Veg_Low-D-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6839 | 14422 | Veg_Low-D-Med-Unconfined | 2 | 11.789382 | 0.010000 | 300.000000 |
| 6839 | 14431 | Veg_Low-D-High-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |

```
6839    14432   Veg_Low-D-High-Unconfined     2       0.000000       0.010000       400.000000
6839    15121   Veg_High-A-Med-Confined       2       0.000000       0.010000       300.000000
6839    15122   Veg_High-A-Med-Unconfined     2       0.000000       0.010000       300.000000
6839    15131   Veg_High-A-High-Confined      2       0.000000       0.010000       400.000000
6839    15132   Veg_High-A-High-Unconfined    2       0.000000       0.010000       400.000000
6839    15221   Veg_High-B-Med-Confined       2       0.000000       0.010000       300.000000
6839    15222   Veg_High-B-Med-Unconfined     2       0.000000       0.010000       300.000000
6839    15231   Veg_High-B-High-Confined      2       0.000000       0.010000       400.000000
6839    15232   Veg_High-B-High-Unconfined    2       0.000000       0.010000       400.000000
6839    15321   Veg_High-C-Med-Confined       2       0.000000       0.010000       300.000000
6839    15322   Veg_High-C-Med-Unconfined     2       0.000000       0.010000       300.000000
6839    15331   Veg_High-C-High-Confined      2       0.000000       0.010000       400.000000
6839    15332   Veg_High-C-High-Unconfined    2       0.000000       0.010000       400.000000
6839    15421   Veg_High-D-Med-Confined       2       0.000000       0.010000       300.000000
6839    15422   Veg_High-D-Med-Unconfined     2       92.507385      0.010000       300.000000
6839    15431   Veg_High-D-High-Confined      2       0.000000       0.010000       400.000000
6839    15432   Veg_High-D-High-Unconfined    2       0.000000       0.010000       400.000000
6839    16000   Water-All-All-All      1      0.000000       0.010000       100.000000
6844    1000    Road_Freeway-All-All-All      1       0.000000       0.030000       100.000000
6844    2000    Road_Primary-All-All-All      1       3.007383       0.020000       100.000000
6844    3000    Road_Minor-All-All-All 1      19.497989      0.010000       100.000000
6844    4000    Dev_ResHigh-All-All-All       1       3.024602       0.020000       100.000000
6844    5000    Dev_ResLow-All-All-All 1      20.169560      0.030000       100.000000
6844    6000    Dev_Com-All-All-All    1      2.997446       0.020000       100.000000
6844    7000    Dev_Ind-All-All-All    1      0.000000       0.010000       100.000000
6844    8000    Dev_Inst-All-All-All   1      0.192866       0.020000       100.000000
6844    9000    Dev_Roof-All-All-All   1      46.216685      0.020000       100.000000
6844    10000   Dev_Overspray-All-All-All     1       1.159484       0.030000       100.000000
6844    11111   Dev_Irrigated-A-Low-Confined  2       0.000000       0.010000       400.000000
6844    11112   Dev_Irrigated-A-Low-Unconfined        2       0.000000       0.010000       400.000000
6844    11121   Dev_Irrigated-A-Med-Confined  2       0.000000       0.010000       300.000000
6844    11122   Dev_Irrigated-A-Med-Unconfined        2       0.000000       0.010000       300.000000
6844    11211   Dev_Irrigated-B-Low-Confined  2       0.000000       0.010000       400.000000
6844    11212   Dev_Irrigated-B-Low-Unconfined        2       0.000000       0.080000       400.000000
6844    11221   Dev_Irrigated-B-Med-Confined  2       0.000000       0.010000       300.000000
6844    11222   Dev_Irrigated-B-Med-Unconfined        2       0.000000       0.050000       300.000000
6844    11311   Dev_Irrigated-C-Low-Confined  2       0.000000       0.010000       400.000000
6844    11312   Dev_Irrigated-C-Low-Unconfined        2       0.000000       0.100000       400.000000
6844    11321   Dev_Irrigated-C-Med-Confined  2       0.000000       0.010000       300.000000
6844    11322   Dev_Irrigated-C-Med-Unconfined        2       0.000000       0.060000       300.000000
6844    11411   Dev_Irrigated-D-Low-Confined  2       0.000000       0.010000       400.000000
6844    11412   Dev_Irrigated-D-Low-Unconfined        2       7.363181       0.010000       400.000000
6844    11421   Dev_Irrigated-D-Med-Confined  2       0.000000       0.010000       300.000000
6844    11422   Dev_Irrigated-D-Med-Unconfined        2       0.000000       0.010000       300.000000
6844    12111   Dev_Pervious-A-Low-Confined   2       0.000000       0.010000       400.000000
6844    12112   Dev_Pervious-A-Low-Unconfined 2       0.000000       0.010000       400.000000
6844    12121   Dev_Pervious-A-Med-Confined   2       0.000000       0.010000       300.000000
6844    12122   Dev_Pervious-A-Med-Unconfined 2       0.000000       0.010000       300.000000
6844    12211   Dev_Pervious-B-Low-Confined   2       0.000000       0.010000       400.000000
6844    12212   Dev_Pervious-B-Low-Unconfined 2       0.000000       0.080000       400.000000
6844    12221   Dev_Pervious-B-Med-Confined   2       0.000000       0.010000       300.000000
6844    12222   Dev_Pervious-B-Med-Unconfined 2       0.000000       0.060000       300.000000
6844    12311   Dev_Pervious-C-Low-Confined   2       0.000000       0.010000       400.000000
6844    12312   Dev_Pervious-C-Low-Unconfined 2       0.000000       0.100000       400.000000
6844    12321   Dev_Pervious-C-Med-Confined   2       0.000000       0.010000       300.000000
6844    12322   Dev_Pervious-C-Med-Unconfined 2       0.000000       0.060000       300.000000
6844    12411   Dev_Pervious-D-Low-Confined   2       0.000000       0.010000       400.000000
6844    12412   Dev_Pervious-D-Low-Unconfined 2       20.364433      0.010000       400.000000
6844    12421   Dev_Pervious-D-Med-Confined   2       0.000000       0.010000       300.000000
6844    12422   Dev_Pervious-D-Med-Unconfined 2       0.000000       0.010000       300.000000
6844    13111   Agriculture-A-Low-Confined    2       0.000000       0.010000       400.000000
6844    13112   Agriculture-A-Low-Unconfined  2       0.000000       0.010000       400.000000
6844    13121   Agriculture-A-Med-Confined    2       0.000000       0.010000       300.000000
6844    13122   Agriculture-A-Med-Unconfined  2       0.000000       0.010000       300.000000
6844    13211   Agriculture-B-Low-Confined    2       0.000000       0.010000       400.000000
6844    13212   Agriculture-B-Low-Unconfined  2       0.000000       0.010000       400.000000
6844    13221   Agriculture-B-Med-Confined    2       0.000000       0.010000       300.000000
6844    13222   Agriculture-B-Med-Unconfined  2       0.000000       0.010000       300.000000
6844    13231   Agriculture-B-High-Confined   2       0.000000       0.010000       400.000000
6844    13232   Agriculture-B-High-Unconfined 2       0.000000       0.010000       400.000000
6844    13311   Agriculture-C-Low-Confined    2       0.000000       0.010000       400.000000
6844    13312   Agriculture-C-Low-Unconfined  2       0.000000       0.010000       400.000000
6844    13321   Agriculture-C-Med-Confined    2       0.000000       0.010000       300.000000
6844    13322   Agriculture-C-Med-Unconfined  2       0.000000       0.010000       300.000000
6844    13331   Agriculture-C-High-Confined   2       0.000000       0.010000       400.000000
6844    13411   Agriculture-D-Low-Confined    2       0.000000       0.010000       400.000000
6844    13412   Agriculture-D-Low-Unconfined  2       0.000000       0.010000       400.000000
6844    13421   Agriculture-D-Med-Confined    2       0.000000       0.010000       300.000000
6844    13422   Agriculture-D-Med-Unconfined  2       0.000000       0.010000       300.000000
```

| | | | | | | |
|---|---|---|---|---|---|---|
| 6844 | 13431 | Agriculture-D-High-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6844 | 13432 | Agriculture-D-High-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6844 | 14121 | Veg_Low-A-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6844 | 14122 | Veg_Low-A-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6844 | 14131 | Veg_Low-A-High-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6844 | 14132 | Veg_Low-A-High-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6844 | 14221 | Veg_Low-B-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6844 | 14222 | Veg_Low-B-Med-Unconfined | 2 | 0.000000 | 0.040000 | 300.000000 |
| 6844 | 14231 | Veg_Low-B-High-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6844 | 14232 | Veg_Low-B-High-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6844 | 14321 | Veg_Low-C-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6844 | 14322 | Veg_Low-C-Med-Unconfined | 2 | 0.000000 | 0.140000 | 300.000000 |
| 6844 | 14331 | Veg_Low-C-High-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6844 | 14332 | Veg_Low-C-High-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6844 | 14421 | Veg_Low-D-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6844 | 14422 | Veg_Low-D-Med-Unconfined | 2 | 9.600268 | 0.010000 | 300.000000 |
| 6844 | 14431 | Veg_Low-D-High-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6844 | 14432 | Veg_Low-D-High-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6844 | 15121 | Veg_High-A-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6844 | 15122 | Veg_High-A-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6844 | 15131 | Veg_High-A-High-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6844 | 15132 | Veg_High-A-High-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6844 | 15221 | Veg_High-B-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6844 | 15222 | Veg_High-B-Med-Unconfined | 2 | 0.000000 | 0.090000 | 300.000000 |
| 6844 | 15231 | Veg_High-B-High-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6844 | 15232 | Veg_High-B-High-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6844 | 15321 | Veg_High-C-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6844 | 15322 | Veg_High-C-Med-Unconfined | 2 | 0.000000 | 0.110000 | 300.000000 |
| 6844 | 15331 | Veg_High-C-High-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6844 | 15332 | Veg_High-C-High-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6844 | 15421 | Veg_High-D-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6844 | 15422 | Veg_High-D-Med-Unconfined | 2 | 59.234758 | 0.010000 | 300.000000 |
| 6844 | 15431 | Veg_High-D-High-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6844 | 15432 | Veg_High-D-High-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6844 | 16000 | Water-All-All-All | 1 | 0.000000 | 0.010000 | 100.000000 |
| 6850 | 1000 | Road_Freeway-All-All-All | 1 | 0.000000 | 0.020000 | 100.000000 |
| 6850 | 2000 | Road_Primary-All-All-All | 1 | 18.040079 | 0.030000 | 100.000000 |
| 6850 | 3000 | Road_Minor-All-All-All | 1 | 48.751825 | 0.010000 | 100.000000 |
| 6850 | 4000 | Dev_ResHigh-All-All-All | 1 | 30.268389 | 0.010000 | 100.000000 |
| 6850 | 5000 | Dev_ResLow-All-All-All | 1 | 31.657937 | 0.030000 | 100.000000 |
| 6850 | 6000 | Dev_Com-All-All-All | 1 | 30.579716 | 0.030000 | 100.000000 |
| 6850 | 7000 | Dev_Ind-All-All-All | 1 | 13.520361 | 0.010000 | 100.000000 |
| 6850 | 8000 | Dev_Inst-All-All-All | 1 | 43.609048 | 0.010000 | 100.000000 |
| 6850 | 9000 | Dev_Roof-All-All-All | 1 | 161.500194 | 0.010000 | 100.000000 |
| 6850 | 10000 | Dev_Overspray-All-All-All | 1 | 3.769618 | 0.030000 | 100.000000 |
| 6850 | 11111 | Dev_Irrigated-A-Low-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6850 | 11112 | Dev_Irrigated-A-Low-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6850 | 11121 | Dev_Irrigated-A-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6850 | 11122 | Dev_Irrigated-A-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6850 | 11211 | Dev_Irrigated-B-Low-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6850 | 11212 | Dev_Irrigated-B-Low-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6850 | 11221 | Dev_Irrigated-B-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6850 | 11222 | Dev_Irrigated-B-Med-Unconfined | 2 | 0.000000 | 0.080000 | 300.000000 |
| 6850 | 11311 | Dev_Irrigated-C-Low-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6850 | 11312 | Dev_Irrigated-C-Low-Unconfined | 2 | 0.000000 | 0.020000 | 400.000000 |
| 6850 | 11321 | Dev_Irrigated-C-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6850 | 11322 | Dev_Irrigated-C-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6850 | 11411 | Dev_Irrigated-D-Low-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6850 | 11412 | Dev_Irrigated-D-Low-Unconfined | 2 | 11.877303 | 0.010000 | 400.000000 |
| 6850 | 11421 | Dev_Irrigated-D-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6850 | 11422 | Dev_Irrigated-D-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6850 | 12111 | Dev_Pervious-A-Low-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6850 | 12112 | Dev_Pervious-A-Low-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6850 | 12121 | Dev_Pervious-A-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6850 | 12122 | Dev_Pervious-A-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6850 | 12211 | Dev_Pervious-B-Low-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6850 | 12212 | Dev_Pervious-B-Low-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6850 | 12221 | Dev_Pervious-B-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6850 | 12222 | Dev_Pervious-B-Med-Unconfined | 2 | 0.000000 | 0.090000 | 300.000000 |
| 6850 | 12311 | Dev_Pervious-C-Low-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6850 | 12312 | Dev_Pervious-C-Low-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6850 | 12321 | Dev_Pervious-C-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6850 | 12322 | Dev_Pervious-C-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6850 | 12411 | Dev_Pervious-D-Low-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6850 | 12412 | Dev_Pervious-D-Low-Unconfined | 2 | 32.743451 | 0.010000 | 400.000000 |
| 6850 | 12421 | Dev_Pervious-D-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6850 | 12422 | Dev_Pervious-D-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6850 | 13111 | Agriculture-A-Low-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6850 | 13112 | Agriculture-A-Low-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |

| | | | | | | |
|---|---|---|---|---|---|---|
| 6850 | 13121 | Agriculture-A-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6850 | 13122 | Agriculture-A-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6850 | 13211 | Agriculture-B-Low-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6850 | 13212 | Agriculture-B-Low-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6850 | 13221 | Agriculture-B-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6850 | 13222 | Agriculture-B-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6850 | 13231 | Agriculture-B-High-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6850 | 13232 | Agriculture-B-High-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6850 | 13311 | Agriculture-C-Low-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6850 | 13312 | Agriculture-C-Low-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6850 | 13321 | Agriculture-C-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6850 | 13322 | Agriculture-C-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6850 | 13331 | Agriculture-C-High-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6850 | 13411 | Agriculture-D-Low-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6850 | 13412 | Agriculture-D-Low-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6850 | 13421 | Agriculture-D-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6850 | 13422 | Agriculture-D-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6850 | 13431 | Agriculture-D-High-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6850 | 13432 | Agriculture-D-High-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6850 | 14121 | Veg_Low-A-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6850 | 14122 | Veg_Low-A-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6850 | 14131 | Veg_Low-A-High-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6850 | 14132 | Veg_Low-A-High-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6850 | 14221 | Veg_Low-B-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6850 | 14222 | Veg_Low-B-Med-Unconfined | 2 | 0.000000 | 0.080000 | 300.000000 |
| 6850 | 14231 | Veg_Low-B-High-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6850 | 14232 | Veg_Low-B-High-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6850 | 14321 | Veg_Low-C-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6850 | 14322 | Veg_Low-C-Med-Unconfined | 2 | 0.000000 | 0.020000 | 300.000000 |
| 6850 | 14331 | Veg_Low-C-High-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6850 | 14332 | Veg_Low-C-High-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6850 | 14421 | Veg_Low-D-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6850 | 14422 | Veg_Low-D-Med-Unconfined | 2 | 37.090045 | 0.010000 | 300.000000 |
| 6850 | 14431 | Veg_Low-D-High-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6850 | 14432 | Veg_Low-D-High-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6850 | 15121 | Veg_High-A-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6850 | 15122 | Veg_High-A-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6850 | 15131 | Veg_High-A-High-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6850 | 15132 | Veg_High-A-High-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6850 | 15221 | Veg_High-B-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6850 | 15222 | Veg_High-B-Med-Unconfined | 2 | 0.000000 | 0.100000 | 300.000000 |
| 6850 | 15231 | Veg_High-B-High-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6850 | 15232 | Veg_High-B-High-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6850 | 15321 | Veg_High-C-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6850 | 15322 | Veg_High-C-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6850 | 15331 | Veg_High-C-High-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6850 | 15332 | Veg_High-C-High-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6850 | 15421 | Veg_High-D-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6850 | 15422 | Veg_High-D-Med-Unconfined | 2 | 115.335430 | 0.010000 | 300.000000 |
| 6850 | 15431 | Veg_High-D-High-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6850 | 15432 | Veg_High-D-High-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6850 | 16000 | Water-All-All-All | 1 | 0.000000 | 0.010000 | 100.000000 |
| 6856 | 1000 | Road_Freeway-All-All-All | 1 | 0.000000 | 0.010000 | 100.000000 |
| 6856 | 2000 | Road_Primary-All-All-All | 1 | 18.861129 | 0.010000 | 100.000000 |
| 6856 | 3000 | Road_Minor-All-All-All | 1 | 12.102120 | 0.010000 | 100.000000 |
| 6856 | 4000 | Dev_ResHigh-All-All-All | 1 | 4.400158 | 0.010000 | 100.000000 |
| 6856 | 5000 | Dev_ResLow-All-All-All | 1 | 3.532308 | 0.010000 | 100.000000 |
| 6856 | 6000 | Dev_Com-All-All-All | 1 | 42.667495 | 0.010000 | 100.000000 |
| 6856 | 7000 | Dev_Ind-All-All-All | 1 | 2.707957 | 0.010000 | 100.000000 |
| 6856 | 8000 | Dev_Inst-All-All-All | 1 | 6.163053 | 0.010000 | 100.000000 |
| 6856 | 9000 | Dev_Roof-All-All-All | 1 | 66.139393 | 0.010000 | 100.000000 |
| 6856 | 10000 | Dev_Overspray-All-All-All | 1 | 1.996291 | 0.010000 | 100.000000 |
| 6856 | 11111 | Dev_Irrigated-A-Low-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6856 | 11112 | Dev_Irrigated-A-Low-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6856 | 11121 | Dev_Irrigated-A-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6856 | 11122 | Dev_Irrigated-A-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6856 | 11211 | Dev_Irrigated-B-Low-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6856 | 11212 | Dev_Irrigated-B-Low-Unconfined | 2 | 0.000000 | 0.040000 | 400.000000 |
| 6856 | 11221 | Dev_Irrigated-B-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6856 | 11222 | Dev_Irrigated-B-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6856 | 11311 | Dev_Irrigated-C-Low-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6856 | 11312 | Dev_Irrigated-C-Low-Unconfined | 2 | 0.000000 | 0.020000 | 400.000000 |
| 6856 | 11321 | Dev_Irrigated-C-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6856 | 11322 | Dev_Irrigated-C-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6856 | 11411 | Dev_Irrigated-D-Low-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6856 | 11412 | Dev_Irrigated-D-Low-Unconfined | 2 | 1.994953 | 0.010000 | 400.000000 |
| 6856 | 11421 | Dev_Irrigated-D-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6856 | 11422 | Dev_Irrigated-D-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6856 | 12111 | Dev_Pervious-A-Low-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |

| | | | | | | |
|---|---|---|---|---|---|---|
| 6856 | 12112 | Dev_Pervious-A-Low-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6856 | 12121 | Dev_Pervious-A-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6856 | 12122 | Dev_Pervious-A-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6856 | 12211 | Dev_Pervious-B-Low-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6856 | 12212 | Dev_Pervious-B-Low-Unconfined | 2 | 0.000000 | 0.040000 | 400.000000 |
| 6856 | 12221 | Dev_Pervious-B-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6856 | 12222 | Dev_Pervious-B-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6856 | 12311 | Dev_Pervious-C-Low-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6856 | 12312 | Dev_Pervious-C-Low-Unconfined | 2 | 0.000000 | 0.020000 | 400.000000 |
| 6856 | 12321 | Dev_Pervious-C-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6856 | 12322 | Dev_Pervious-C-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6856 | 12411 | Dev_Pervious-D-Low-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6856 | 12412 | Dev_Pervious-D-Low-Unconfined | 2 | 5.680504 | 0.010000 | 400.000000 |
| 6856 | 12421 | Dev_Pervious-D-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6856 | 12422 | Dev_Pervious-D-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6856 | 13111 | Agriculture-A-Low-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6856 | 13112 | Agriculture-A-Low-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6856 | 13121 | Agriculture-A-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6856 | 13122 | Agriculture-A-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6856 | 13211 | Agriculture-B-Low-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6856 | 13212 | Agriculture-B-Low-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6856 | 13221 | Agriculture-B-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6856 | 13222 | Agriculture-B-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6856 | 13231 | Agriculture-B-High-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6856 | 13232 | Agriculture-B-High-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6856 | 13311 | Agriculture-C-Low-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6856 | 13312 | Agriculture-C-Low-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6856 | 13321 | Agriculture-C-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6856 | 13322 | Agriculture-C-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6856 | 13331 | Agriculture-C-High-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6856 | 13411 | Agriculture-D-Low-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6856 | 13412 | Agriculture-D-Low-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6856 | 13421 | Agriculture-D-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6856 | 13422 | Agriculture-D-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6856 | 13431 | Agriculture-D-High-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6856 | 13432 | Agriculture-D-High-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6856 | 14121 | Veg_Low-A-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6856 | 14122 | Veg_Low-A-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6856 | 14131 | Veg_Low-A-High-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6856 | 14132 | Veg_Low-A-High-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6856 | 14221 | Veg_Low-B-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6856 | 14222 | Veg_Low-B-Med-Unconfined | 2 | 0.000000 | 0.020000 | 300.000000 |
| 6856 | 14231 | Veg_Low-B-High-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6856 | 14232 | Veg_Low-B-High-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6856 | 14321 | Veg_Low-C-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6856 | 14322 | Veg_Low-C-Med-Unconfined | 2 | 0.000000 | 0.020000 | 300.000000 |
| 6856 | 14331 | Veg_Low-C-High-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6856 | 14332 | Veg_Low-C-High-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6856 | 14421 | Veg_Low-D-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6856 | 14422 | Veg_Low-D-Med-Unconfined | 2 | 12.447606 | 0.010000 | 300.000000 |
| 6856 | 14431 | Veg_Low-D-High-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6856 | 14432 | Veg_Low-D-High-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6856 | 15121 | Veg_High-A-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6856 | 15122 | Veg_High-A-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6856 | 15131 | Veg_High-A-High-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6856 | 15132 | Veg_High-A-High-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6856 | 15221 | Veg_High-B-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6856 | 15222 | Veg_High-B-Med-Unconfined | 2 | 0.000000 | 0.020000 | 300.000000 |
| 6856 | 15231 | Veg_High-B-High-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6856 | 15232 | Veg_High-B-High-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6856 | 15321 | Veg_High-C-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6856 | 15322 | Veg_High-C-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6856 | 15331 | Veg_High-C-High-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6856 | 15332 | Veg_High-C-High-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6856 | 15421 | Veg_High-D-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6856 | 15422 | Veg_High-D-Med-Unconfined | 2 | 18.646808 | 0.010000 | 300.000000 |
| 6856 | 15431 | Veg_High-D-High-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6856 | 15432 | Veg_High-D-High-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6856 | 16000 | Water-All-All-All | 1 | 0.000000 | 0.010000 | 100.000000 |
| 6859 | 1000 | Road_Freeway-All-All-All | 1 | 0.000000 | 0.010000 | 100.000000 |
| 6859 | 2000 | Road_Primary-All-All-All | 1 | 21.008865 | 0.020000 | 100.000000 |
| 6859 | 3000 | Road_Minor-All-All-All | 1 | 57.359338 | 0.010000 | 100.000000 |
| 6859 | 4000 | Dev_ResHigh-All-All-All | 1 | 27.022121 | 0.010000 | 100.000000 |
| 6859 | 5000 | Dev_ResLow-All-All-All | 1 | 41.396450 | 0.020000 | 100.000000 |
| 6859 | 6000 | Dev_Com-All-All-All | 1 | 28.203617 | 0.010000 | 100.000000 |
| 6859 | 7000 | Dev_Ind-All-All-All | 1 | 31.876501 | 0.010000 | 100.000000 |
| 6859 | 8000 | Dev_Inst-All-All-All | 1 | 37.128734 | 0.020000 | 100.000000 |
| 6859 | 9000 | Dev_Roof-All-All-All | 1 | 200.677088 | 0.010000 | 100.000000 |
| 6859 | 10000 | Dev_Overspray-All-All-All | 1 | 3.807016 | 0.020000 | 100.000000 |

```
6859    11111   Dev_Irrigated-A-Low-Confined  2       0.000000       0.010000       400.000000
6859    11112   Dev_Irrigated-A-Low-Unconfined        2       0.000000       0.010000       400.000000
6859    11121   Dev_Irrigated-A-Med-Confined  2       0.000000       0.010000       300.000000
6859    11122   Dev_Irrigated-A-Med-Unconfined        2       0.000000       0.010000       300.000000
6859    11211   Dev_Irrigated-B-Low-Confined  2       0.000000       0.010000       400.000000
6859    11212   Dev_Irrigated-B-Low-Unconfined        2       0.000000       0.070000       400.000000
6859    11221   Dev_Irrigated-B-Med-Confined  2       0.000000       0.010000       300.000000
6859    11222   Dev_Irrigated-B-Med-Unconfined        2       0.000000       0.060000       300.000000
6859    11311   Dev_Irrigated-C-Low-Confined  2       0.000000       0.010000       400.000000
6859    11312   Dev_Irrigated-C-Low-Unconfined        2       0.000000       0.010000       400.000000
6859    11321   Dev_Irrigated-C-Med-Confined  2       0.000000       0.010000       300.000000
6859    11322   Dev_Irrigated-C-Med-Unconfined        2       0.000000       0.060000       300.000000
6859    11411   Dev_Irrigated-D-Low-Confined  2       0.000000       0.010000       400.000000
6859    11412   Dev_Irrigated-D-Low-Unconfined        2       17.620890      0.010000       400.000000
6859    11421   Dev_Irrigated-D-Med-Confined  2       0.000000       0.010000       300.000000
6859    11422   Dev_Irrigated-D-Med-Unconfined        2       0.000000       0.010000       300.000000
6859    12111   Dev_Pervious-A-Low-Confined   2       0.000000       0.010000       400.000000
6859    12112   Dev_Pervious-A-Low-Unconfined 2       0.000000       0.010000       400.000000
6859    12121   Dev_Pervious-A-Med-Confined   2       0.000000       0.010000       300.000000
6859    12122   Dev_Pervious-A-Med-Unconfined 2       0.000000       0.010000       300.000000
6859    12211   Dev_Pervious-B-Low-Confined   2       0.000000       0.010000       400.000000
6859    12212   Dev_Pervious-B-Low-Unconfined 2       0.000000       0.040000       400.000000
6859    12221   Dev_Pervious-B-Med-Confined   2       0.000000       0.010000       300.000000
6859    12222   Dev_Pervious-B-Med-Unconfined 2       0.000000       0.060000       300.000000
6859    12311   Dev_Pervious-C-Low-Confined   2       0.000000       0.010000       400.000000
6859    12312   Dev_Pervious-C-Low-Unconfined 2       0.000000       0.010000       400.000000
6859    12321   Dev_Pervious-C-Med-Confined   2       0.000000       0.010000       300.000000
6859    12322   Dev_Pervious-C-Med-Unconfined 2       0.000000       0.060000       300.000000
6859    12411   Dev_Pervious-D-Low-Confined   2       0.000000       0.010000       400.000000
6859    12412   Dev_Pervious-D-Low-Unconfined 2       49.372158      0.010000       400.000000
6859    12421   Dev_Pervious-D-Med-Confined   2       0.000000       0.010000       300.000000
6859    12422   Dev_Pervious-D-Med-Unconfined 2       0.000000       0.010000       300.000000
6859    13111   Agriculture-A-Low-Confined    2       0.000000       0.010000       400.000000
6859    13112   Agriculture-A-Low-Unconfined  2       0.000000       0.010000       400.000000
6859    13121   Agriculture-A-Med-Confined    2       0.000000       0.010000       300.000000
6859    13122   Agriculture-A-Med-Unconfined  2       0.000000       0.010000       300.000000
6859    13211   Agriculture-B-Low-Confined    2       0.000000       0.010000       400.000000
6859    13212   Agriculture-B-Low-Unconfined  2       0.000000       0.010000       400.000000
6859    13221   Agriculture-B-Med-Confined    2       0.000000       0.010000       300.000000
6859    13222   Agriculture-B-Med-Unconfined  2       0.000000       0.010000       300.000000
6859    13231   Agriculture-B-High-Confined   2       0.000000       0.010000       400.000000
6859    13232   Agriculture-B-High-Unconfined 2       0.000000       0.010000       400.000000
6859    13311   Agriculture-C-Low-Confined    2       0.000000       0.010000       400.000000
6859    13312   Agriculture-C-Low-Unconfined  2       0.000000       0.010000       400.000000
6859    13321   Agriculture-C-Med-Confined    2       0.000000       0.010000       300.000000
6859    13322   Agriculture-C-Med-Unconfined  2       0.000000       0.010000       300.000000
6859    13331   Agriculture-C-High-Confined   2       0.000000       0.010000       400.000000
6859    13411   Agriculture-D-Low-Confined    2       0.000000       0.010000       400.000000
6859    13412   Agriculture-D-Low-Unconfined  2       0.000000       0.010000       400.000000
6859    13421   Agriculture-D-Med-Confined    2       0.000000       0.010000       300.000000
6859    13422   Agriculture-D-Med-Unconfined  2       0.000000       0.010000       300.000000
6859    13431   Agriculture-D-High-Confined   2       0.000000       0.010000       400.000000
6859    13432   Agriculture-D-High-Unconfined 2       0.000000       0.010000       400.000000
6859    14121   Veg_Low-A-Med-Confined 2      0.000000       0.010000       300.000000
6859    14122   Veg_Low-A-Med-Unconfined      2       0.000000       0.010000       300.000000
6859    14131   Veg_Low-A-High-Confined       2       0.000000       0.010000       400.000000
6859    14132   Veg_Low-A-High-Unconfined     2       0.000000       0.010000       400.000000
6859    14221   Veg_Low-B-Med-Confined 2      0.000000       0.010000       300.000000
6859    14222   Veg_Low-B-Med-Unconfined      2       0.000000       0.080000       300.000000
6859    14231   Veg_Low-B-High-Confined       2       0.000000       0.010000       400.000000
6859    14232   Veg_Low-B-High-Unconfined     2       0.000000       0.010000       400.000000
6859    14321   Veg_Low-C-Med-Confined 2      0.000000       0.010000       300.000000
6859    14322   Veg_Low-C-Med-Unconfined      2       0.000000       0.010000       300.000000
6859    14331   Veg_Low-C-High-Confined       2       0.000000       0.010000       400.000000
6859    14332   Veg_Low-C-High-Unconfined     2       0.000000       0.010000       400.000000
6859    14421   Veg_Low-D-Med-Confined 2      0.000000       0.010000       300.000000
6859    14422   Veg_Low-D-Med-Unconfined      2       34.984324      0.010000       300.000000
6859    14431   Veg_Low-D-High-Confined       2       0.000000       0.010000       400.000000
6859    14432   Veg_Low-D-High-Unconfined     2       0.000000       0.010000       400.000000
6859    15121   Veg_High-A-Med-Confined       2       0.000000       0.010000       300.000000
6859    15122   Veg_High-A-Med-Unconfined     2       0.000000       0.010000       300.000000
6859    15131   Veg_High-A-High-Confined      2       0.000000       0.010000       400.000000
6859    15132   Veg_High-A-High-Unconfined    2       0.000000       0.010000       400.000000
6859    15221   Veg_High-B-Med-Confined       2       0.000000       0.010000       300.000000
6859    15222   Veg_High-B-Med-Unconfined     2       0.000000       0.110000       300.000000
6859    15231   Veg_High-B-High-Confined      2       0.000000       0.010000       400.000000
6859    15232   Veg_High-B-High-Unconfined    2       0.000000       0.010000       400.000000
6859    15321   Veg_High-C-Med-Confined       2       0.000000       0.010000       300.000000
6859    15322   Veg_High-C-Med-Unconfined     2       0.000000       0.010000       300.000000
```

```
6859    15331  Veg_High-C-High-Confined      2       0.000000       0.010000       400.000000
6859    15332  Veg_High-C-High-Unconfined    2       0.000000       0.010000       400.000000
6859    15421  Veg_High-D-Med-Confined       2       0.000000       0.010000       300.000000
6859    15422  Veg_High-D-Med-Unconfined     2       132.181212     0.010000       300.000000
6859    15431  Veg_High-D-High-Confined      2       0.000000       0.010000       400.000000
6859    15432  Veg_High-D-High-Unconfined    2       0.000000       0.010000       400.000000
6859    16000  Water-All-All-All      1      0.000000       0.010000       100.000000
6861    1000   Road_Freeway-All-All-All      1       0.000000       0.010000       100.000000
6861    2000   Road_Primary-All-All-All      1       14.875887      0.010000       100.000000
6861    3000   Road_Minor-All-All-All 1      26.057185      0.010000       100.000000
6861    4000   Dev_ResHigh-All-All-All       1       9.043504       0.010000       100.000000
6861    5000   Dev_ResLow-All-All-All 1      24.717777      0.010000       100.000000
6861    6000   Dev_Com-All-All-All    1      7.290946       0.010000       100.000000
6861    7000   Dev_Ind-All-All-All    1      6.006385       0.010000       100.000000
6861    8000   Dev_Inst-All-All-All   1      12.023423      0.020000       100.000000
6861    9000   Dev_Roof-All-All-All   1      91.156744      0.010000       100.000000
6861    10000  Dev_Overspray-All-All-All     1       1.737169       0.020000       100.000000
6861    11111  Dev_Irrigated-A-Low-Confined  2       0.000000       0.010000       400.000000
6861    11112  Dev_Irrigated-A-Low-Unconfined        2      0.000000       0.010000       400.000000
6861    11121  Dev_Irrigated-A-Med-Confined  2       0.000000       0.010000       300.000000
6861    11122  Dev_Irrigated-A-Med-Unconfined        2      0.000000       0.010000       300.000000
6861    11211  Dev_Irrigated-B-Low-Confined  2       0.000000       0.010000       400.000000
6861    11212  Dev_Irrigated-B-Low-Unconfined        2      0.000000       0.080000       400.000000
6861    11221  Dev_Irrigated-B-Med-Confined  2       0.000000       0.010000       300.000000
6861    11222  Dev_Irrigated-B-Med-Unconfined        2      0.000000       0.050000       300.000000
6861    11311  Dev_Irrigated-C-Low-Confined  2       0.000000       0.010000       400.000000
6861    11312  Dev_Irrigated-C-Low-Unconfined        2      0.000000       0.010000       400.000000
6861    11321  Dev_Irrigated-C-Med-Confined  2       0.000000       0.010000       300.000000
6861    11322  Dev_Irrigated-C-Med-Unconfined        2      0.000000       0.010000       300.000000
6861    11411  Dev_Irrigated-D-Low-Confined  2       0.000000       0.010000       400.000000
6861    11412  Dev_Irrigated-D-Low-Unconfined        2      9.107063       0.010000       400.000000
6861    11421  Dev_Irrigated-D-Med-Confined  2       0.000000       0.010000       300.000000
6861    11422  Dev_Irrigated-D-Med-Unconfined        2      0.001494       0.010000       300.000000
6861    12111  Dev_Pervious-A-Low-Confined   2       0.000000       0.010000       400.000000
6861    12112  Dev_Pervious-A-Low-Unconfined 2       0.000000       0.010000       400.000000
6861    12121  Dev_Pervious-A-Med-Confined   2       0.000000       0.010000       300.000000
6861    12122  Dev_Pervious-A-Med-Unconfined 2       0.000000       0.010000       300.000000
6861    12211  Dev_Pervious-B-Low-Confined   2       0.000000       0.010000       400.000000
6861    12212  Dev_Pervious-B-Low-Unconfined 2       0.000000       0.070000       400.000000
6861    12221  Dev_Pervious-B-Med-Confined   2       0.000000       0.010000       300.000000
6861    12222  Dev_Pervious-B-Med-Unconfined 2       0.000000       0.050000       300.000000
6861    12311  Dev_Pervious-C-Low-Confined   2       0.000000       0.010000       400.000000
6861    12312  Dev_Pervious-C-Low-Unconfined 2       0.000000       0.010000       400.000000
6861    12321  Dev_Pervious-C-Med-Confined   2       0.000000       0.010000       300.000000
6861    12322  Dev_Pervious-C-Med-Unconfined 2       0.000000       0.010000       300.000000
6861    12411  Dev_Pervious-D-Low-Confined   2       0.000000       0.010000       400.000000
6861    12412  Dev_Pervious-D-Low-Unconfined 2       25.548664      0.010000       400.000000
6861    12421  Dev_Pervious-D-Med-Confined   2       0.000000       0.010000       300.000000
6861    12422  Dev_Pervious-D-Med-Unconfined 2       0.008859       0.010000       300.000000
6861    13111  Agriculture-A-Low-Confined    2       0.000000       0.010000       400.000000
6861    13112  Agriculture-A-Low-Unconfined  2       0.000000       0.010000       400.000000
6861    13121  Agriculture-A-Med-Confined    2       0.000000       0.010000       300.000000
6861    13122  Agriculture-A-Med-Unconfined  2       0.000000       0.010000       300.000000
6861    13211  Agriculture-B-Low-Confined    2       0.000000       0.010000       400.000000
6861    13212  Agriculture-B-Low-Unconfined  2       0.000000       0.010000       400.000000
6861    13221  Agriculture-B-Med-Confined    2       0.000000       0.010000       300.000000
6861    13222  Agriculture-B-Med-Unconfined  2       0.000000       0.010000       300.000000
6861    13231  Agriculture-B-High-Confined   2       0.000000       0.010000       400.000000
6861    13232  Agriculture-B-High-Unconfined 2       0.000000       0.010000       400.000000
6861    13311  Agriculture-C-Low-Confined    2       0.000000       0.010000       400.000000
6861    13312  Agriculture-C-Low-Unconfined  2       0.000000       0.010000       400.000000
6861    13321  Agriculture-C-Med-Confined    2       0.000000       0.010000       300.000000
6861    13322  Agriculture-C-Med-Unconfined  2       0.000000       0.010000       300.000000
6861    13331  Agriculture-C-High-Confined   2       0.000000       0.010000       400.000000
6861    13411  Agriculture-D-Low-Confined    2       0.000000       0.010000       400.000000
6861    13412  Agriculture-D-Low-Unconfined  2       0.000000       0.010000       400.000000
6861    13421  Agriculture-D-Med-Confined    2       0.000000       0.010000       300.000000
6861    13422  Agriculture-D-Med-Unconfined  2       0.000000       0.010000       300.000000
6861    13431  Agriculture-D-High-Confined   2       0.000000       0.010000       400.000000
6861    13432  Agriculture-D-High-Unconfined 2       0.000000       0.010000       400.000000
6861    14121  Veg_Low-A-Med-Confined 2      0.000000       0.010000       300.000000
6861    14122  Veg_Low-A-Med-Unconfined      2       0.000000       0.010000       300.000000
6861    14131  Veg_Low-A-High-Confined       2       0.000000       0.010000       400.000000
6861    14132  Veg_Low-A-High-Unconfined     2       0.000000       0.010000       400.000000
6861    14221  Veg_Low-B-Med-Confined 2      0.000000       0.010000       300.000000
6861    14222  Veg_Low-B-Med-Unconfined      2       0.000000       0.040000       300.000000
6861    14231  Veg_Low-B-High-Confined       2       0.000000       0.010000       400.000000
6861    14232  Veg_Low-B-High-Unconfined     2       0.000000       0.010000       400.000000
6861    14321  Veg_Low-C-Med-Confined 2      0.000000       0.010000       300.000000
```

```
       6861    14322   Veg_Low-C-Med-Unconfined      2      0.000000      0.010000      300.000000
       6861    14331   Veg_Low-C-High-Confined       2      0.000000      0.010000      400.000000
       6861    14332   Veg_Low-C-High-Unconfined     2      0.000000      0.010000      400.000000
       6861    14421   Veg_Low-D-Med-Confined 2      0.000000      0.010000      300.000000
       6861    14422   Veg_Low-D-Med-Unconfined      2      18.002399     0.010000      300.000000
       6861    14431   Veg_Low-D-High-Confined       2      0.000000      0.010000      400.000000
       6861    14432   Veg_Low-D-High-Unconfined     2      0.000000      0.010000      400.000000
       6861    15121   Veg_High-A-Med-Confined       2      0.000000      0.010000      300.000000
       6861    15122   Veg_High-A-Med-Unconfined     2      0.000000      0.010000      300.000000
       6861    15131   Veg_High-A-High-Confined      2      0.000000      0.010000      400.000000
       6861    15132   Veg_High-A-High-Unconfined    2      0.000000      0.010000      400.000000
       6861    15221   Veg_High-B-Med-Confined       2      0.000000      0.010000      300.000000
       6861    15222   Veg_High-B-Med-Unconfined     2      0.000000      0.040000      300.000000
       6861    15231   Veg_High-B-High-Confined      2      0.000000      0.010000      400.000000
       6861    15232   Veg_High-B-High-Unconfined    2      0.000000      0.010000      400.000000
       6861    15321   Veg_High-C-Med-Confined       2      0.000000      0.010000      300.000000
       6861    15322   Veg_High-C-Med-Unconfined     2      0.000000      0.010000      300.000000
       6861    15331   Veg_High-C-High-Confined      2      0.000000      0.010000      400.000000
       6861    15332   Veg_High-C-High-Unconfined    2      0.000000      0.010000      400.000000
       6861    15421   Veg_High-D-Med-Confined       2      0.000000      0.010000      300.000000
       6861    15422   Veg_High-D-Med-Unconfined     2      62.919092     0.010000      300.000000
       6861    15431   Veg_High-D-High-Confined      2      0.000000      0.010000      400.000000
       6861    15432   Veg_High-D-High-Unconfined    2      0.000000      0.010000      400.000000
       6861    16000   Water-All-All-All     1      0.000000      0.010000      100.000000
c------------------------------------------------------------------------------------------
c92  SNOW-FLAGS
c
c defid     parameter group id
c deluid    landuse id
c iceflag   0 = Ice formation in the snow pack is not simulated
c           1 = Ice formation is simulated
c forest    0.0 - 1.0  Fraction of LAND covered by Forest (winter transpiration)
c fzg       parameter that adjusts for the effect of ice (in the snow pack) on infiltration when iceflag is 1
(/in.)
c fzgl      lower limit of inffac as adjusted by ice in the snow pack when iceflag is 1
c
c defid  deluid  iceflag  forest  fzg  fzgl
c---------------------------------------------------------------------------------------------
c93  snow-parm
c
c defid    parameter group id
c deluid   landuse id
c lat      latitude of the pervious land segment (PLS) - ENERGY BALANCE METHOD ONLY (degree)
c          positive for the northern hemisphere, negative for southern
c melev    mean elevation of LAND above sea level - ENERGY BALANCE METHOD ONLY (ft)
c shade    fraction of LAND shaded from solar radiation (i.e. by trees) - ENERGY BALANCE METHOD ONLY
c snowcf   precipitation-to-snow multiplier (accounts for poor gage-catch efficiency during snow)
c covind   maximum snowpack (water equivalent) at which the entire LAND is covered with snow (in)
c
c defid   deluid   lat   melev   shade   snowcf   covind
c---------------------------------------------------------------------------------------------
c94  snow-parm2
c
c defid    parameter group id
c deluid   landuse id
c rdcsn    density of cold, new snow relative to water (For snow falling at temps below freezing.
c          at higher temperatures the density of snow is adjusted)
c tsnow    air temperature below which precipitation will be snow, under saturated conditions (deg F)
c          under non-saturated conditions the temperature is adjusted slightly.
c snoevp   adapts sublimation equation to field conditions - ENERGY BALANCE METHOD ONLY
c ccfact   adapts snow condensation/convection melt equation to field conditions - ENERGY BALANCE METHOD ONLY
c mwater   maximum water content of the snow pack, in depth of water per depth of water.
c mgmelt   maximum rate of snowmelt by ground heat, in depth of water per day (in/day)
c          this is the value which applies when the pack temperature is at the freezing point.
c
c defid   deluid   rdcsn     tsnow   snoevp    ccfact    mwater    mgmelt
c---------------------------------------------------------------------------------------------
c96  snow-init
c
c   defid       parameter group id
c   deluid      landuse id
c   pack-snow   initial quantity of snow in the pack (water equivalent).
c   pack-ice    initial quantity of ice in the pack (water equivalent).
c   pack-watr   initial quantity of liquid water in the pack.
c   rdenpf      density of the frozen contents (snow and ice) of the pack, relative to water.
c   dull        index of the dullness of the snow pack surface, from which albedo is estimated - ENERGY BALANCE
METHOD ONLY
c   paktmp      mean temperature of the frozen contents of the snow pack.
c   covinx      current snow pack depth (water equivalent) required to obtain complete areal coverage of LAND.
```

```
c               if the pack is less than this amount, areal coverage is prorated (PACKF/COVINX).
c   xlnmlt      current remaining possible increment to ice storage in the pack.
c               relevant when Ice formation is simulated (iceflag = 1)
c   skyclr      fraction of sky which is assumed to be clear at the present time.
c
c defid   deluid   pack-snow   pack-ice   pack-watr   rdenpf   dull   paktmp   covinx   xlnmlt   skyclr
c---------------------------------------------------------------------------------------------
c100 pwat-parm1
c    pervious and impervious land hydrology control
c
c    (value of 0 = use constant pwat-parm4; 1 = use corresponding monthly variable card)
c
c    vcsfg    interception storage capacity     (card 150)
c    vuzfg    upper zone nominal storage      (card 160)
c    vnnfg    manning's n for the overland flow plane  (card 170)
c    vifwfg   interflow inflow parameter      (card 180)
c    vircfg   interflow recession constant     (card 190)
c    vlefg    lower zone evapotranspiration (e-t) parameter (card 200)
c
c vcsfg  vuzfg  vnnfg  vifwfg  vircfg  vlefg
       0      0      0      0      0      0
c------------------------------------------------------------------------------------------
c110 pwat-parm2
c
c    defid   parameter group id
c    deluid  landuse id
c    lzsn    lower zone nominal soil moisture storage (inches)
c    infilt  infiltration capacity of the soil (in/hr)
c    kvary   variable groundwater recession (1/inches)
c    agwrc   base groundwater recession (none)
c
c defid deluid lzsn      infilt      kvary      agwrc
       33      1000   0.000000      0.000000      0.000000      0.000000
       33      2000   0.000000      0.000000      0.000000      0.000000
       33      3000   0.000000      0.000000      0.000000      0.000000
       33      4000   0.000000      0.000000      0.000000      0.000000
       33      5000   0.000000      0.000000      0.000000      0.000000
       33      6000   0.000000      0.000000      0.000000      0.000000
       33      7000   0.000000      0.000000      0.000000      0.000000
       33      8000   0.000000      0.000000      0.000000      0.000000
       33      9000   0.000000      0.000000      0.000000      0.000000
       33      10000  0.000000      0.000000      0.000000      0.000000
       33      11111  7.000000      0.400000      0.000000      0.920000
       33      11112  7.000000      0.400000      0.000000      0.920000
       33      11121  7.000000      0.400000      0.000000      0.920000
       33      11122  7.000000      0.400000      0.000000      0.920000
       33      11211  7.000000      0.200000      0.000000      0.920000
       33      11212  7.000000      0.200000      0.000000      0.920000
       33      11221  7.000000      0.200000      0.000000      0.920000
       33      11222  7.000000      0.200000      0.000000      0.920000
       33      11311  7.000000      0.080000      0.000000      0.920000
       33      11312  7.000000      0.080000      0.000000      0.920000
       33      11321  7.000000      0.080000      0.000000      0.920000
       33      11322  7.000000      0.080000      0.000000      0.920000
       33      11411  7.000000      0.040000      0.000000      0.920000
       33      11412  7.000000      0.040000      0.000000      0.920000
       33      11421  7.000000      0.040000      0.000000      0.920000
       33      11422  7.000000      0.040000      0.000000      0.920000
       33      12111  7.000000      0.400000      0.000000      0.920000
       33      12112  7.000000      0.400000      0.000000      0.920000
       33      12121  7.000000      0.400000      0.000000      0.920000
       33      12122  7.000000      0.400000      0.000000      0.920000
       33      12211  7.000000      0.200000      0.000000      0.920000
       33      12212  7.000000      0.200000      0.000000      0.920000
       33      12221  7.000000      0.200000      0.000000      0.920000
       33      12222  7.000000      0.200000      0.000000      0.920000
       33      12311  7.000000      0.080000      0.000000      0.920000
       33      12312  7.000000      0.080000      0.000000      0.920000
       33      12321  7.000000      0.080000      0.000000      0.920000
       33      12322  7.000000      0.080000      0.000000      0.920000
       33      12411  7.000000      0.040000      0.000000      0.920000
       33      12412  7.000000      0.040000      0.000000      0.920000
       33      12421  7.000000      0.040000      0.000000      0.920000
       33      12422  7.000000      0.040000      0.000000      0.920000
       33      13111  7.000000      0.800000      0.000000      0.920000
       33      13112  7.000000      0.800000      0.000000      0.920000
       33      13121  7.000000      0.800000      0.000000      0.920000
       33      13122  7.000000      0.800000      0.000000      0.920000
       33      13211  7.000000      0.400000      0.000000      0.920000
```

```
33      13212   7.000000        0.400000        0.000000        0.920000
33      13221   7.000000        0.400000        0.000000        0.920000
33      13222   7.000000        0.400000        0.000000        0.920000
33      13231   7.000000        0.400000        0.000000        0.920000
33      13232   7.000000        0.400000        0.000000        0.920000
33      13311   7.000000        0.200000        0.000000        0.920000
33      13312   7.000000        0.200000        0.000000        0.920000
33      13321   7.000000        0.200000        0.000000        0.920000
33      13322   7.000000        0.200000        0.000000        0.920000
33      13331   7.000000        0.200000        0.000000        0.920000
33      13411   7.000000        0.100000        0.000000        0.920000
33      13412   7.000000        0.100000        0.000000        0.920000
33      13421   7.000000        0.100000        0.000000        0.920000
33      13422   7.000000        0.100000        0.000000        0.920000
33      13431   7.000000        0.100000        0.000000        0.920000
33      13432   7.000000        0.100000        0.000000        0.920000
33      14121   8.500000        0.600000        0.000000        0.980000
33      14122   8.500000        0.600000        0.000000        0.980000
33      14131   8.500000        0.600000        0.000000        0.980000
33      14132   8.500000        0.600000        0.000000        0.980000
33      14221   8.500000        0.300000        0.000000        0.980000
33      14222   8.500000        0.300000        0.000000        0.980000
33      14231   8.500000        0.300000        0.000000        0.980000
33      14232   8.500000        0.300000        0.000000        0.980000
33      14321   8.500000        0.120000        0.000000        0.980000
33      14322   8.500000        0.120000        0.000000        0.980000
33      14331   8.500000        0.120000        0.000000        0.980000
33      14332   8.500000        0.120000        0.000000        0.980000
33      14421   8.500000        0.040000        0.000000        0.980000
33      14422   8.500000        0.040000        0.000000        0.980000
33      14431   8.500000        0.040000        0.000000        0.980000
33      14432   8.500000        0.040000        0.000000        0.980000
33      15121   8.500000        0.600000        0.000000        0.980000
33      15122   8.500000        0.600000        0.000000        0.980000
33      15131   8.500000        0.600000        0.000000        0.980000
33      15132   8.500000        0.600000        0.000000        0.980000
33      15221   8.500000        0.300000        0.000000        0.980000
33      15222   8.500000        0.300000        0.000000        0.980000
33      15231   8.500000        0.300000        0.000000        0.980000
33      15232   8.500000        0.300000        0.000000        0.980000
33      15321   8.500000        0.120000        0.000000        0.980000
33      15322   8.500000        0.120000        0.000000        0.980000
33      15331   8.500000        0.120000        0.000000        0.980000
33      15332   8.500000        0.120000        0.000000        0.980000
33      15421   8.500000        0.040000        0.000000        0.980000
33      15422   8.500000        0.040000        0.000000        0.980000
33      15431   8.500000        0.040000        0.000000        0.980000
33      15432   8.500000        0.040000        0.000000        0.980000
33      16000   0.000000        0.000000        0.000000        0.000000
40      1000    0.000000        0.000000        0.000000        0.000000
40      2000    0.000000        0.000000        0.000000        0.000000
40      3000    0.000000        0.000000        0.000000        0.000000
40      4000    0.000000        0.000000        0.000000        0.000000
40      5000    0.000000        0.000000        0.000000        0.000000
40      6000    0.000000        0.000000        0.000000        0.000000
40      7000    0.000000        0.000000        0.000000        0.000000
40      8000    0.000000        0.000000        0.000000        0.000000
40      9000    0.000000        0.000000        0.000000        0.000000
40      10000   0.000000        0.000000        0.000000        0.000000
40      11111   7.000000        0.400000        0.000000        0.920000
40      11112   7.000000        0.400000        0.000000        0.920000
40      11121   7.000000        0.400000        0.000000        0.920000
40      11122   7.000000        0.400000        0.000000        0.920000
40      11211   7.000000        0.200000        0.000000        0.920000
40      11212   7.000000        0.200000        0.000000        0.920000
40      11221   7.000000        0.200000        0.000000        0.920000
40      11222   7.000000        0.200000        0.000000        0.920000
40      11311   7.000000        0.080000        0.000000        0.920000
40      11312   7.000000        0.080000        0.000000        0.920000
40      11321   7.000000        0.080000        0.000000        0.920000
40      11322   7.000000        0.080000        0.000000        0.920000
40      11411   7.000000        0.040000        0.000000        0.920000
40      11412   7.000000        0.040000        0.000000        0.920000
40      11421   7.000000        0.040000        0.000000        0.920000
40      11422   7.000000        0.040000        0.000000        0.920000
40      12111   7.000000        0.400000        0.000000        0.920000
40      12112   7.000000        0.400000        0.000000        0.920000
40      12121   7.000000        0.400000        0.000000        0.920000
40      12122   7.000000        0.400000        0.000000        0.920000
```

```
       40      12211  7.000000       0.200000       0.000000       0.920000
       40      12212  7.000000       0.200000       0.000000       0.920000
       40      12221  7.000000       0.200000       0.000000       0.920000
       40      12222  7.000000       0.200000       0.000000       0.920000
       40      12311  7.000000       0.080000       0.000000       0.920000
       40      12312  7.000000       0.080000       0.000000       0.920000
       40      12321  7.000000       0.080000       0.000000       0.920000
       40      12322  7.000000       0.080000       0.000000       0.920000
       40      12411  7.000000       0.040000       0.000000       0.920000
       40      12412  7.000000       0.040000       0.000000       0.920000
       40      12421  7.000000       0.040000       0.000000       0.920000
       40      12422  7.000000       0.040000       0.000000       0.920000
       40      13111  7.000000       0.800000       0.000000       0.920000
       40      13112  7.000000       0.800000       0.000000       0.920000
       40      13121  7.000000       0.800000       0.000000       0.920000
       40      13122  7.000000       0.800000       0.000000       0.920000
       40      13211  7.000000       0.400000       0.000000       0.920000
       40      13212  7.000000       0.400000       0.000000       0.920000
       40      13221  7.000000       0.400000       0.000000       0.920000
       40      13222  7.000000       0.400000       0.000000       0.920000
       40      13231  7.000000       0.400000       0.000000       0.920000
       40      13232  7.000000       0.400000       0.000000       0.920000
       40      13311  7.000000       0.200000       0.000000       0.920000
       40      13312  7.000000       0.200000       0.000000       0.920000
       40      13321  7.000000       0.200000       0.000000       0.920000
       40      13322  7.000000       0.200000       0.000000       0.920000
       40      13331  7.000000       0.200000       0.000000       0.920000
       40      13411  7.000000       0.100000       0.000000       0.920000
       40      13412  7.000000       0.100000       0.000000       0.920000
       40      13421  7.000000       0.100000       0.000000       0.920000
       40      13422  7.000000       0.100000       0.000000       0.920000
       40      13431  7.000000       0.100000       0.000000       0.920000
       40      13432  7.000000       0.100000       0.000000       0.920000
       40      14121  8.500000       0.600000       0.000000       0.980000
       40      14122  8.500000       0.600000       0.000000       0.980000
       40      14131  8.500000       0.600000       0.000000       0.980000
       40      14132  8.500000       0.600000       0.000000       0.980000
       40      14221  8.500000       0.300000       0.000000       0.980000
       40      14222  8.500000       0.300000       0.000000       0.980000
       40      14231  8.500000       0.300000       0.000000       0.980000
       40      14232  8.500000       0.300000       0.000000       0.980000
       40      14321  8.500000       0.120000       0.000000       0.980000
       40      14322  8.500000       0.120000       0.000000       0.980000
       40      14331  8.500000       0.120000       0.000000       0.980000
       40      14332  8.500000       0.120000       0.000000       0.980000
       40      14421  8.500000       0.040000       0.000000       0.980000
       40      14422  8.500000       0.040000       0.000000       0.980000
       40      14431  8.500000       0.040000       0.000000       0.980000
       40      14432  8.500000       0.040000       0.000000       0.980000
       40      15121  8.500000       0.600000       0.000000       0.980000
       40      15122  8.500000       0.600000       0.000000       0.980000
       40      15131  8.500000       0.600000       0.000000       0.980000
       40      15132  8.500000       0.600000       0.000000       0.980000
       40      15221  8.500000       0.300000       0.000000       0.980000
       40      15222  8.500000       0.300000       0.000000       0.980000
       40      15231  8.500000       0.300000       0.000000       0.980000
       40      15232  8.500000       0.300000       0.000000       0.980000
       40      15321  8.500000       0.120000       0.000000       0.980000
       40      15322  8.500000       0.120000       0.000000       0.980000
       40      15331  8.500000       0.120000       0.000000       0.980000
       40      15332  8.500000       0.120000       0.000000       0.980000
       40      15421  8.500000       0.040000       0.000000       0.980000
       40      15422  8.500000       0.040000       0.000000       0.980000
       40      15431  8.500000       0.040000       0.000000       0.980000
       40      15432  8.500000       0.040000       0.000000       0.980000
       40      16000  0.000000       0.000000       0.000000       0.000000
c-----------------------------------------------------------------------------------------
c120 pwat-parm3
c
c    defid   parameter group id
c    deluid  landuse id
c    petmax  air temperature below which e-t will is reduced (deg F)
c    petmin  air temperature below which e-t is set to zero (deg F)
c    infexp  exponent in the infiltration equation (none)
c    infild  ratio between the maximum and mean infiltration capacities over the PLS (none)
c    deepfr  fraction of groundwater inflow that will enter deep groundwater (none)
c    basetp  fraction of remaining potential e-t that can be satisfied from baseflow (none)
c    agwetp  fraction of remaining potential e-t that can be satisfied from active groundwater (none)
c
```

```
c defid deluid   petmax     petmin     infexp     infild     deepfr     basetp     agwetp
       33      1000    45.000000      35.000000      0.000000       0.000000       0.000000       0.000000
       0.000000
       33      2000    45.000000      35.000000      0.000000       0.000000       0.000000       0.000000
       0.000000
       33      3000    45.000000      35.000000      0.000000       0.000000       0.000000       0.000000
       0.000000
       33      4000    45.000000      35.000000      0.000000       0.000000       0.000000       0.000000
       0.000000
       33      5000    45.000000      35.000000      0.000000       0.000000       0.000000       0.000000
       0.000000
       33      6000    45.000000      35.000000      0.000000       0.000000       0.000000       0.000000
       0.000000
       33      7000    45.000000      35.000000      0.000000       0.000000       0.000000       0.000000
       0.000000
       33      8000    45.000000      35.000000      0.000000       0.000000       0.000000       0.000000
       0.000000
       33      9000    45.000000      35.000000      0.000000       0.000000       0.000000       0.000000
       0.000000
       33      10000   45.000000      35.000000      0.000000       0.000000       0.000000       0.000000
       0.000000
       33      11111   45.000000      35.000000      2.000000       2.000000       0.000000       0.000000
       0.000000
       33      11112   45.000000      35.000000      2.000000       2.000000       0.300000       0.000000
       0.000000
       33      11121   45.000000      35.000000      2.000000       2.000000       0.000000       0.000000
       0.000000
       33      11122   45.000000      35.000000      2.000000       2.000000       0.300000       0.000000
       0.000000
       33      11211   45.000000      35.000000      2.000000       2.000000       0.000000       0.000000
       0.000000
       33      11212   45.000000      35.000000      2.000000       2.000000       0.300000       0.000000
       0.000000
       33      11221   45.000000      35.000000      2.000000       2.000000       0.000000       0.000000
       0.000000
       33      11222   45.000000      35.000000      2.000000       2.000000       0.300000       0.000000
       0.000000
       33      11311   45.000000      35.000000      2.000000       2.000000       0.000000       0.000000
       0.000000
       33      11312   45.000000      35.000000      2.000000       2.000000       0.300000       0.000000
       0.000000
       33      11321   45.000000      35.000000      2.000000       2.000000       0.000000       0.000000
       0.000000
       33      11322   45.000000      35.000000      2.000000       2.000000       0.300000       0.000000
       0.000000
       33      11411   45.000000      35.000000      2.000000       2.000000       0.000000       0.000000
       0.000000
       33      11412   45.000000      35.000000      2.000000       2.000000       0.300000       0.000000
       0.000000
       33      11421   45.000000      35.000000      2.000000       2.000000       0.000000       0.000000
       0.000000
       33      11422   45.000000      35.000000      2.000000       2.000000       0.300000       0.000000
       0.000000
       33      12111   45.000000      35.000000      2.000000       2.000000       0.000000       0.000000
       0.000000
       33      12112   45.000000      35.000000      2.000000       2.000000       0.300000       0.000000
       0.000000
       33      12121   45.000000      35.000000      2.000000       2.000000       0.000000       0.000000
       0.000000
       33      12122   45.000000      35.000000      2.000000       2.000000       0.300000       0.000000
       0.000000
       33      12211   45.000000      35.000000      2.000000       2.000000       0.000000       0.000000
       0.000000
       33      12212   45.000000      35.000000      2.000000       2.000000       0.300000       0.000000
       0.000000
       33      12221   45.000000      35.000000      2.000000       2.000000       0.000000       0.000000
       0.000000
       33      12222   45.000000      35.000000      2.000000       2.000000       0.300000       0.000000
       0.000000
       33      12311   45.000000      35.000000      2.000000       2.000000       0.000000       0.000000
       0.000000
       33      12312   45.000000      35.000000      2.000000       2.000000       0.300000       0.000000
       0.000000
       33      12321   45.000000      35.000000      2.000000       2.000000       0.000000       0.000000
       0.000000
       33      12322   45.000000      35.000000      2.000000       2.000000       0.300000       0.000000
       0.000000
       33      12411   45.000000      35.000000      2.000000       2.000000       0.000000       0.000000
       0.000000
```

```
33      12412   45.000000       35.000000       2.000000        2.000000        0.300000        0.000000
0.000000
33      12421   45.000000       35.000000       2.000000        2.000000        0.000000        0.000000
0.000000
33      12422   45.000000       35.000000       2.000000        2.000000        0.300000        0.000000
0.000000
33      13111   45.000000       35.000000       2.000000        2.000000        0.000000        0.000000
0.000000
33      13112   45.000000       35.000000       2.000000        2.000000        0.300000        0.000000
0.000000
33      13121   45.000000       35.000000       2.000000        2.000000        0.000000        0.000000
0.000000
33      13122   45.000000       35.000000       2.000000        2.000000        0.300000        0.000000
0.000000
33      13211   45.000000       35.000000       2.000000        2.000000        0.000000        0.000000
0.000000
33      13212   45.000000       35.000000       2.000000        2.000000        0.300000        0.000000
0.000000
33      13221   45.000000       35.000000       2.000000        2.000000        0.000000        0.000000
0.000000
33      13222   45.000000       35.000000       2.000000        2.000000        0.300000        0.000000
0.000000
33      13231   45.000000       35.000000       2.000000        2.000000        0.000000        0.000000
0.000000
33      13232   45.000000       35.000000       2.000000        2.000000        0.300000        0.000000
0.000000
33      13311   45.000000       35.000000       2.000000        2.000000        0.000000        0.000000
0.000000
33      13312   45.000000       35.000000       2.000000        2.000000        0.300000        0.000000
0.000000
33      13321   45.000000       35.000000       2.000000        2.000000        0.000000        0.000000
0.000000
33      13322   45.000000       35.000000       2.000000        2.000000        0.300000        0.000000
0.000000
33      13331   45.000000       35.000000       2.000000        2.000000        0.000000        0.000000
0.000000
33      13411   45.000000       35.000000       2.000000        2.000000        0.000000        0.000000
0.000000
33      13412   45.000000       35.000000       2.000000        2.000000        0.300000        0.000000
0.000000
33      13421   45.000000       35.000000       2.000000        2.000000        0.000000        0.000000
0.000000
33      13422   45.000000       35.000000       2.000000        2.000000        0.300000        0.000000
0.000000
33      13431   45.000000       35.000000       2.000000        2.000000        0.000000        0.000000
0.000000
33      13432   45.000000       35.000000       2.000000        2.000000        0.300000        0.000000
0.000000
33      14121   45.000000       35.000000       2.000000        2.000000        0.000000        0.010000
0.030000
33      14122   45.000000       35.000000       2.000000        2.000000        0.300000        0.010000
0.030000
33      14131   45.000000       35.000000       2.000000        2.000000        0.000000        0.010000
0.030000
33      14132   45.000000       35.000000       2.000000        2.000000        0.300000        0.010000
0.030000
33      14221   45.000000       35.000000       2.000000        2.000000        0.000000        0.010000
0.030000
33      14222   45.000000       35.000000       2.000000        2.000000        0.300000        0.010000
0.030000
33      14231   45.000000       35.000000       2.000000        2.000000        0.000000        0.010000
0.030000
33      14232   45.000000       35.000000       2.000000        2.000000        0.300000        0.010000
0.030000
33      14321   45.000000       35.000000       2.000000        2.000000        0.000000        0.010000
0.030000
33      14322   45.000000       35.000000       2.000000        2.000000        0.300000        0.010000
0.030000
33      14331   45.000000       35.000000       2.000000        2.000000        0.000000        0.010000
0.030000
33      14332   45.000000       35.000000       2.000000        2.000000        0.300000        0.010000
0.030000
33      14421   45.000000       35.000000       2.000000        2.000000        0.000000        0.010000
0.030000
33      14422   45.000000       35.000000       2.000000        2.000000        0.300000        0.010000
0.030000
33      14431   45.000000       35.000000       2.000000        2.000000        0.000000        0.010000
0.030000
```

```
33      14432   45.000000      35.000000      2.000000       2.000000       0.300000       0.010000
0.030000
33      15121   45.000000      35.000000      2.000000       2.000000       0.000000       0.010000
0.030000
33      15122   45.000000      35.000000      2.000000       2.000000       0.300000       0.010000
0.030000
33      15131   45.000000      35.000000      2.000000       2.000000       0.000000       0.010000
0.030000
33      15132   45.000000      35.000000      2.000000       2.000000       0.300000       0.010000
0.030000
33      15221   45.000000      35.000000      2.000000       2.000000       0.000000       0.010000
0.030000
33      15222   45.000000      35.000000      2.000000       2.000000       0.300000       0.010000
0.030000
33      15231   45.000000      35.000000      2.000000       2.000000       0.000000       0.010000
0.030000
33      15232   45.000000      35.000000      2.000000       2.000000       0.300000       0.010000
0.030000
33      15321   45.000000      35.000000      2.000000       2.000000       0.000000       0.010000
0.030000
33      15322   45.000000      35.000000      2.000000       2.000000       0.300000       0.010000
0.030000
33      15331   45.000000      35.000000      2.000000       2.000000       0.000000       0.010000
0.030000
33      15332   45.000000      35.000000      2.000000       2.000000       0.300000       0.010000
0.030000
33      15421   45.000000      35.000000      2.000000       2.000000       0.000000       0.010000
0.030000
33      15422   45.000000      35.000000      2.000000       2.000000       0.300000       0.010000
0.030000
33      15431   45.000000      35.000000      2.000000       2.000000       0.000000       0.010000
0.030000
33      15432   45.000000      35.000000      2.000000       2.000000       0.300000       0.010000
0.030000
33      16000   45.000000      35.000000      2.000000       2.000000       0.000000       0.010000
0.030000
40      1000    45.000000      35.000000      0.000000       0.000000       0.000000       0.000000
0.000000
40      2000    45.000000      35.000000      0.000000       0.000000       0.000000       0.000000
0.000000
40      3000    45.000000      35.000000      0.000000       0.000000       0.000000       0.000000
0.000000
40      4000    45.000000      35.000000      0.000000       0.000000       0.000000       0.000000
0.000000
40      5000    45.000000      35.000000      0.000000       0.000000       0.000000       0.000000
0.000000
40      6000    45.000000      35.000000      0.000000       0.000000       0.000000       0.000000
0.000000
40      7000    45.000000      35.000000      0.000000       0.000000       0.000000       0.000000
0.000000
40      8000    45.000000      35.000000      0.000000       0.000000       0.000000       0.000000
0.000000
40      9000    45.000000      35.000000      0.000000       0.000000       0.000000       0.000000
0.000000
40      10000   45.000000      35.000000      0.000000       0.000000       0.000000       0.000000
0.000000
40      11111   45.000000      35.000000      2.000000       2.000000       0.000000       0.000000
0.000000
40      11112   45.000000      35.000000      2.000000       2.000000       0.300000       0.000000
0.000000
40      11121   45.000000      35.000000      2.000000       2.000000       0.000000       0.000000
0.000000
40      11122   45.000000      35.000000      2.000000       2.000000       0.300000       0.000000
0.000000
40      11211   45.000000      35.000000      2.000000       2.000000       0.000000       0.000000
0.000000
40      11212   45.000000      35.000000      2.000000       2.000000       0.300000       0.000000
0.000000
40      11221   45.000000      35.000000      2.000000       2.000000       0.000000       0.000000
0.000000
40      11222   45.000000      35.000000      2.000000       2.000000       0.300000       0.000000
0.000000
40      11311   45.000000      35.000000      2.000000       2.000000       0.000000       0.000000
0.000000
40      11312   45.000000      35.000000      2.000000       2.000000       0.300000       0.000000
0.000000
40      11321   45.000000      35.000000      2.000000       2.000000       0.000000       0.000000
0.000000
```

```
40      11322   45.000000       35.000000       2.000000        2.000000        0.300000        0.000000
0.000000
40      11411   45.000000       35.000000       2.000000        2.000000        0.000000        0.000000
0.000000
40      11412   45.000000       35.000000       2.000000        2.000000        0.300000        0.000000
0.000000
40      11421   45.000000       35.000000       2.000000        2.000000        0.000000        0.000000
0.000000
40      11422   45.000000       35.000000       2.000000        2.000000        0.300000        0.000000
0.000000
40      12111   45.000000       35.000000       2.000000        2.000000        0.000000        0.000000
0.000000
40      12112   45.000000       35.000000       2.000000        2.000000        0.300000        0.000000
0.000000
40      12121   45.000000       35.000000       2.000000        2.000000        0.000000        0.000000
0.000000
40      12122   45.000000       35.000000       2.000000        2.000000        0.300000        0.000000
0.000000
40      12211   45.000000       35.000000       2.000000        2.000000        0.000000        0.000000
0.000000
40      12212   45.000000       35.000000       2.000000        2.000000        0.300000        0.000000
0.000000
40      12221   45.000000       35.000000       2.000000        2.000000        0.000000        0.000000
0.000000
40      12222   45.000000       35.000000       2.000000        2.000000        0.300000        0.000000
0.000000
40      12311   45.000000       35.000000       2.000000        2.000000        0.000000        0.000000
0.000000
40      12312   45.000000       35.000000       2.000000        2.000000        0.300000        0.000000
0.000000
40      12321   45.000000       35.000000       2.000000        2.000000        0.000000        0.000000
0.000000
40      12322   45.000000       35.000000       2.000000        2.000000        0.300000        0.000000
0.000000
40      12411   45.000000       35.000000       2.000000        2.000000        0.000000        0.000000
0.000000
40      12412   45.000000       35.000000       2.000000        2.000000        0.300000        0.000000
0.000000
40      12421   45.000000       35.000000       2.000000        2.000000        0.000000        0.000000
0.000000
40      12422   45.000000       35.000000       2.000000        2.000000        0.300000        0.000000
0.000000
40      13111   45.000000       35.000000       2.000000        2.000000        0.000000        0.000000
0.000000
40      13112   45.000000       35.000000       2.000000        2.000000        0.300000        0.000000
0.000000
40      13121   45.000000       35.000000       2.000000        2.000000        0.000000        0.000000
0.000000
40      13122   45.000000       35.000000       2.000000        2.000000        0.300000        0.000000
0.000000
40      13211   45.000000       35.000000       2.000000        2.000000        0.000000        0.000000
0.000000
40      13212   45.000000       35.000000       2.000000        2.000000        0.300000        0.000000
0.000000
40      13221   45.000000       35.000000       2.000000        2.000000        0.000000        0.000000
0.000000
40      13222   45.000000       35.000000       2.000000        2.000000        0.300000        0.000000
0.000000
40      13231   45.000000       35.000000       2.000000        2.000000        0.000000        0.000000
0.000000
40      13232   45.000000       35.000000       2.000000        2.000000        0.300000        0.000000
0.000000
40      13311   45.000000       35.000000       2.000000        2.000000        0.000000        0.000000
0.000000
40      13312   45.000000       35.000000       2.000000        2.000000        0.300000        0.000000
0.000000
40      13321   45.000000       35.000000       2.000000        2.000000        0.000000        0.000000
0.000000
40      13322   45.000000       35.000000       2.000000        2.000000        0.300000        0.000000
0.000000
40      13331   45.000000       35.000000       2.000000        2.000000        0.000000        0.000000
0.000000
40      13411   45.000000       35.000000       2.000000        2.000000        0.000000        0.000000
0.000000
40      13412   45.000000       35.000000       2.000000        2.000000        0.300000        0.000000
0.000000
40      13421   45.000000       35.000000       2.000000        2.000000        0.000000        0.000000
0.000000
```

```
        40      13422   45.000000       35.000000       2.000000        2.000000        0.300000        0.000000
        0.000000
        40      13431   45.000000       35.000000       2.000000        2.000000        0.000000        0.000000
        0.000000
        40      13432   45.000000       35.000000       2.000000        2.000000        0.300000        0.000000
        0.000000
        40      14121   45.000000       35.000000       2.000000        2.000000        0.000000        0.010000
        0.030000
        40      14122   45.000000       35.000000       2.000000        2.000000        0.300000        0.010000
        0.030000
        40      14131   45.000000       35.000000       2.000000        2.000000        0.000000        0.010000
        0.030000
        40      14132   45.000000       35.000000       2.000000        2.000000        0.300000        0.010000
        0.030000
        40      14221   45.000000       35.000000       2.000000        2.000000        0.000000        0.010000
        0.030000
        40      14222   45.000000       35.000000       2.000000        2.000000        0.300000        0.010000
        0.030000
        40      14231   45.000000       35.000000       2.000000        2.000000        0.000000        0.010000
        0.030000
        40      14232   45.000000       35.000000       2.000000        2.000000        0.300000        0.010000
        0.030000
        40      14321   45.000000       35.000000       2.000000        2.000000        0.000000        0.010000
        0.030000
        40      14322   45.000000       35.000000       2.000000        2.000000        0.300000        0.010000
        0.030000
        40      14331   45.000000       35.000000       2.000000        2.000000        0.000000        0.010000
        0.030000
        40      14332   45.000000       35.000000       2.000000        2.000000        0.300000        0.010000
        0.030000
        40      14421   45.000000       35.000000       2.000000        2.000000        0.000000        0.010000
        0.030000
        40      14422   45.000000       35.000000       2.000000        2.000000        0.300000        0.010000
        0.030000
        40      14431   45.000000       35.000000       2.000000        2.000000        0.000000        0.010000
        0.030000
        40      14432   45.000000       35.000000       2.000000        2.000000        0.300000        0.010000
        0.030000
        40      15121   45.000000       35.000000       2.000000        2.000000        0.000000        0.010000
        0.030000
        40      15122   45.000000       35.000000       2.000000        2.000000        0.300000        0.010000
        0.030000
        40      15131   45.000000       35.000000       2.000000        2.000000        0.000000        0.010000
        0.030000
        40      15132   45.000000       35.000000       2.000000        2.000000        0.300000        0.010000
        0.030000
        40      15221   45.000000       35.000000       2.000000        2.000000        0.000000        0.010000
        0.030000
        40      15222   45.000000       35.000000       2.000000        2.000000        0.300000        0.010000
        0.030000
        40      15231   45.000000       35.000000       2.000000        2.000000        0.000000        0.010000
        0.030000
        40      15232   45.000000       35.000000       2.000000        2.000000        0.300000        0.010000
        0.030000
        40      15321   45.000000       35.000000       2.000000        2.000000        0.000000        0.010000
        0.030000
        40      15322   45.000000       35.000000       2.000000        2.000000        0.300000        0.010000
        0.030000
        40      15331   45.000000       35.000000       2.000000        2.000000        0.000000        0.010000
        0.030000
        40      15332   45.000000       35.000000       2.000000        2.000000        0.300000        0.010000
        0.030000
        40      15421   45.000000       35.000000       2.000000        2.000000        0.000000        0.010000
        0.030000
        40      15422   45.000000       35.000000       2.000000        2.000000        0.300000        0.010000
        0.030000
        40      15431   45.000000       35.000000       2.000000        2.000000        0.000000        0.010000
        0.030000
        40      15432   45.000000       35.000000       2.000000        2.000000        0.300000        0.010000
        0.030000
        40      16000   45.000000       35.000000       2.000000        2.000000        0.000000        0.010000
        0.030000
c------------------------------------------------------------------------------------------
c130 pwat-parm4
c
c    defid   parameter group id
c    deluid  landuse id
c    cepsc   interception storage capacity (inches)
c    uzsn    upper zone nominal storage (inches)
```

```
c    nsur    Manning's n for the assumed overland flow plane (none)
c    intfw   interflow inflow parameter (none)
c    irc     interflow recession parameter (none)
c    lzetp   lower zone e-t parameter (none)
c
c defid deluid   cepsc      uzsn     nsur       intfw       irc        lzetp
        33      1000   0.040000       0.000000       0.011000       0.000000       0.000000       0.000000
        33      2000   0.040000       0.000000       0.011000       0.000000       0.000000       0.000000
        33      3000   0.040000       0.000000       0.011000       0.000000       0.000000       0.000000
        33      4000   0.040000       0.000000       0.011000       0.000000       0.000000       0.000000
        33      5000   0.040000       0.000000       0.011000       0.000000       0.000000       0.000000
        33      6000   0.040000       0.000000       0.011000       0.000000       0.000000       0.000000
        33      7000   0.040000       0.000000       0.011000       0.000000       0.000000       0.000000
        33      8000   0.040000       0.000000       0.011000       0.000000       0.000000       0.000000
        33      9000   0.020000       0.000000       0.011000       0.000000       0.000000       0.000000
        33      10000  0.040000       0.000000       0.011000       0.000000       0.000000       0.000000
        33      11111  0.060000       0.700000       0.200000       0.500000       0.300000       0.200000
        33      11112  0.060000       0.700000       0.200000       0.500000       0.300000       0.200000
        33      11121  0.060000       0.560000       0.200000       0.500000       0.300000       0.200000
        33      11122  0.060000       0.560000       0.200000       0.500000       0.300000       0.200000
        33      11211  0.060000       0.700000       0.200000       0.500000       0.300000       0.200000
        33      11212  0.060000       0.700000       0.200000       0.500000       0.300000       0.200000
        33      11221  0.060000       0.560000       0.200000       0.500000       0.300000       0.200000
        33      11222  0.060000       0.560000       0.200000       0.500000       0.300000       0.200000
        33      11311  0.060000       0.700000       0.200000       0.500000       0.300000       0.200000
        33      11312  0.060000       0.700000       0.200000       0.500000       0.300000       0.200000
        33      11321  0.060000       0.560000       0.200000       0.500000       0.300000       0.200000
        33      11322  0.060000       0.560000       0.200000       0.500000       0.300000       0.200000
        33      11411  0.060000       0.700000       0.200000       0.500000       0.300000       0.200000
        33      11412  0.060000       0.700000       0.200000       0.500000       0.300000       0.200000
        33      11421  0.060000       0.560000       0.200000       0.500000       0.300000       0.200000
        33      11422  0.060000       0.560000       0.200000       0.500000       0.300000       0.200000
        33      12111  0.060000       0.700000       0.200000       0.500000       0.300000       0.200000
        33      12112  0.060000       0.700000       0.200000       0.500000       0.300000       0.200000
        33      12121  0.060000       0.560000       0.200000       0.500000       0.300000       0.200000
        33      12122  0.060000       0.560000       0.200000       0.500000       0.300000       0.200000
        33      12211  0.060000       0.700000       0.200000       0.500000       0.300000       0.200000
        33      12212  0.060000       0.700000       0.200000       0.500000       0.300000       0.200000
        33      12221  0.060000       0.560000       0.200000       0.500000       0.300000       0.200000
        33      12222  0.060000       0.560000       0.200000       0.500000       0.300000       0.200000
        33      12311  0.060000       0.700000       0.200000       0.500000       0.300000       0.200000
        33      12312  0.060000       0.700000       0.200000       0.500000       0.300000       0.200000
        33      12321  0.060000       0.560000       0.200000       0.500000       0.300000       0.200000
        33      12322  0.060000       0.560000       0.200000       0.500000       0.300000       0.200000
        33      12411  0.060000       0.700000       0.200000       0.500000       0.300000       0.200000
        33      12412  0.060000       0.700000       0.200000       0.500000       0.300000       0.200000
        33      12421  0.060000       0.560000       0.200000       0.500000       0.300000       0.200000
        33      12422  0.060000       0.560000       0.200000       0.500000       0.300000       0.200000
        33      13111  0.100000       0.700000       0.200000       1.000000       0.300000       0.500000
        33      13112  0.100000       0.700000       0.200000       1.000000       0.300000       0.500000
        33      13121  0.100000       0.560000       0.200000       1.000000       0.300000       0.500000
        33      13122  0.100000       0.560000       0.200000       1.000000       0.300000       0.500000
        33      13211  0.100000       0.700000       0.200000       1.000000       0.300000       0.500000
        33      13212  0.100000       0.700000       0.200000       1.000000       0.300000       0.500000
        33      13221  0.100000       0.560000       0.200000       1.000000       0.300000       0.500000
        33      13222  0.100000       0.560000       0.200000       1.000000       0.300000       0.500000
        33      13231  0.100000       0.420000       0.200000       1.000000       0.300000       0.500000
        33      13232  0.100000       0.420000       0.200000       1.000000       0.300000       0.500000
        33      13311  0.100000       0.700000       0.200000       1.000000       0.300000       0.500000
        33      13312  0.100000       0.700000       0.200000       1.000000       0.300000       0.500000
        33      13321  0.100000       0.560000       0.200000       1.000000       0.300000       0.500000
        33      13322  0.100000       0.560000       0.200000       1.000000       0.300000       0.500000
        33      13331  0.100000       0.420000       0.200000       1.000000       0.300000       0.500000
        33      13411  0.100000       0.700000       0.200000       1.000000       0.300000       0.500000
        33      13412  0.100000       0.700000       0.200000       1.000000       0.300000       0.500000
        33      13421  0.100000       0.560000       0.200000       1.000000       0.300000       0.500000
        33      13422  0.100000       0.560000       0.200000       1.000000       0.300000       0.500000
        33      13431  0.100000       0.420000       0.200000       1.000000       0.300000       0.500000
        33      13432  0.100000       0.420000       0.200000       1.000000       0.300000       0.500000
        33      14121  0.130000       0.850000       0.200000       1.000000       0.300000       0.700000
        33      14122  0.130000       0.850000       0.200000       1.000000       0.300000       0.700000
        33      14131  0.100000       0.680000       0.200000       1.000000       0.300000       0.700000
        33      14132  0.100000       0.680000       0.200000       1.000000       0.300000       0.700000
        33      14221  0.130000       0.850000       0.200000       1.000000       0.300000       0.700000
        33      14222  0.130000       0.850000       0.200000       1.000000       0.300000       0.700000
        33      14231  0.100000       0.680000       0.200000       1.000000       0.300000       0.700000
        33      14232  0.100000       0.680000       0.200000       1.000000       0.300000       0.700000
        33      14321  0.130000       0.850000       0.200000       1.000000       0.300000       0.700000
        33      14322  0.130000       0.850000       0.200000       1.000000       0.300000       0.700000
```

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 33 | 14331 | 0.100000 | 0.680000 | 0.200000 | 1.000000 | 0.300000 | 0.700000 |
| 33 | 14332 | 0.100000 | 0.680000 | 0.200000 | 1.000000 | 0.300000 | 0.700000 |
| 33 | 14421 | 0.130000 | 0.850000 | 0.200000 | 1.000000 | 0.300000 | 0.700000 |
| 33 | 14422 | 0.130000 | 0.850000 | 0.200000 | 1.000000 | 0.300000 | 0.700000 |
| 33 | 14431 | 0.100000 | 0.680000 | 0.200000 | 1.000000 | 0.300000 | 0.700000 |
| 33 | 14432 | 0.100000 | 0.680000 | 0.200000 | 1.000000 | 0.300000 | 0.700000 |
| 33 | 15121 | 0.150000 | 0.850000 | 0.250000 | 1.000000 | 0.300000 | 0.700000 |
| 33 | 15122 | 0.150000 | 0.850000 | 0.250000 | 1.000000 | 0.300000 | 0.700000 |
| 33 | 15131 | 0.130000 | 0.680000 | 0.250000 | 1.000000 | 0.300000 | 0.700000 |
| 33 | 15132 | 0.130000 | 0.680000 | 0.250000 | 1.000000 | 0.300000 | 0.700000 |
| 33 | 15221 | 0.150000 | 0.850000 | 0.250000 | 1.000000 | 0.300000 | 0.700000 |
| 33 | 15222 | 0.150000 | 0.850000 | 0.250000 | 1.000000 | 0.300000 | 0.700000 |
| 33 | 15231 | 0.130000 | 0.680000 | 0.250000 | 1.000000 | 0.300000 | 0.700000 |
| 33 | 15232 | 0.130000 | 0.680000 | 0.250000 | 1.000000 | 0.300000 | 0.700000 |
| 33 | 15321 | 0.150000 | 0.850000 | 0.250000 | 1.000000 | 0.300000 | 0.700000 |
| 33 | 15322 | 0.150000 | 0.850000 | 0.250000 | 1.000000 | 0.300000 | 0.700000 |
| 33 | 15331 | 0.130000 | 0.680000 | 0.250000 | 1.000000 | 0.300000 | 0.700000 |
| 33 | 15332 | 0.130000 | 0.680000 | 0.250000 | 1.000000 | 0.300000 | 0.700000 |
| 33 | 15421 | 0.150000 | 0.850000 | 0.250000 | 1.000000 | 0.300000 | 0.700000 |
| 33 | 15422 | 0.150000 | 0.850000 | 0.250000 | 1.000000 | 0.300000 | 0.700000 |
| 33 | 15431 | 0.130000 | 0.680000 | 0.250000 | 1.000000 | 0.300000 | 0.700000 |
| 33 | 15432 | 0.130000 | 0.680000 | 0.250000 | 1.000000 | 0.300000 | 0.700000 |
| 33 | 16000 | 0.000000 | 0.000000 | 0.000000 | 0.000000 | 0.000000 | 0.000000 |
| 40 | 1000 | 0.040000 | 0.000000 | 0.011000 | 0.000000 | 0.000000 | 0.000000 |
| 40 | 2000 | 0.040000 | 0.000000 | 0.011000 | 0.000000 | 0.000000 | 0.000000 |
| 40 | 3000 | 0.040000 | 0.000000 | 0.011000 | 0.000000 | 0.000000 | 0.000000 |
| 40 | 4000 | 0.040000 | 0.000000 | 0.011000 | 0.000000 | 0.000000 | 0.000000 |
| 40 | 5000 | 0.040000 | 0.000000 | 0.011000 | 0.000000 | 0.000000 | 0.000000 |
| 40 | 6000 | 0.040000 | 0.000000 | 0.011000 | 0.000000 | 0.000000 | 0.000000 |
| 40 | 7000 | 0.040000 | 0.000000 | 0.011000 | 0.000000 | 0.000000 | 0.000000 |
| 40 | 8000 | 0.040000 | 0.000000 | 0.011000 | 0.000000 | 0.000000 | 0.000000 |
| 40 | 9000 | 0.020000 | 0.000000 | 0.011000 | 0.000000 | 0.000000 | 0.000000 |
| 40 | 10000 | 0.040000 | 0.000000 | 0.011000 | 0.000000 | 0.000000 | 0.000000 |
| 40 | 11111 | 0.060000 | 0.700000 | 0.200000 | 0.500000 | 0.300000 | 0.200000 |
| 40 | 11112 | 0.060000 | 0.700000 | 0.200000 | 0.500000 | 0.300000 | 0.200000 |
| 40 | 11121 | 0.060000 | 0.560000 | 0.200000 | 0.500000 | 0.300000 | 0.200000 |
| 40 | 11122 | 0.060000 | 0.560000 | 0.200000 | 0.500000 | 0.300000 | 0.200000 |
| 40 | 11211 | 0.060000 | 0.700000 | 0.200000 | 0.500000 | 0.300000 | 0.200000 |
| 40 | 11212 | 0.060000 | 0.700000 | 0.200000 | 0.500000 | 0.300000 | 0.200000 |
| 40 | 11221 | 0.060000 | 0.560000 | 0.200000 | 0.500000 | 0.300000 | 0.200000 |
| 40 | 11222 | 0.060000 | 0.560000 | 0.200000 | 0.500000 | 0.300000 | 0.200000 |
| 40 | 11311 | 0.060000 | 0.700000 | 0.200000 | 0.500000 | 0.300000 | 0.200000 |
| 40 | 11312 | 0.060000 | 0.700000 | 0.200000 | 0.500000 | 0.300000 | 0.200000 |
| 40 | 11321 | 0.060000 | 0.560000 | 0.200000 | 0.500000 | 0.300000 | 0.200000 |
| 40 | 11322 | 0.060000 | 0.560000 | 0.200000 | 0.500000 | 0.300000 | 0.200000 |
| 40 | 11411 | 0.060000 | 0.700000 | 0.200000 | 0.500000 | 0.300000 | 0.200000 |
| 40 | 11412 | 0.060000 | 0.700000 | 0.200000 | 0.500000 | 0.300000 | 0.200000 |
| 40 | 11421 | 0.060000 | 0.560000 | 0.200000 | 0.500000 | 0.300000 | 0.200000 |
| 40 | 11422 | 0.060000 | 0.560000 | 0.200000 | 0.500000 | 0.300000 | 0.200000 |
| 40 | 12111 | 0.060000 | 0.700000 | 0.200000 | 0.500000 | 0.300000 | 0.200000 |
| 40 | 12112 | 0.060000 | 0.700000 | 0.200000 | 0.500000 | 0.300000 | 0.200000 |
| 40 | 12121 | 0.060000 | 0.560000 | 0.200000 | 0.500000 | 0.300000 | 0.200000 |
| 40 | 12122 | 0.060000 | 0.560000 | 0.200000 | 0.500000 | 0.300000 | 0.200000 |
| 40 | 12211 | 0.060000 | 0.700000 | 0.200000 | 0.500000 | 0.300000 | 0.200000 |
| 40 | 12212 | 0.060000 | 0.700000 | 0.200000 | 0.500000 | 0.300000 | 0.200000 |
| 40 | 12221 | 0.060000 | 0.560000 | 0.200000 | 0.500000 | 0.300000 | 0.200000 |
| 40 | 12222 | 0.060000 | 0.560000 | 0.200000 | 0.500000 | 0.300000 | 0.200000 |
| 40 | 12311 | 0.060000 | 0.700000 | 0.200000 | 0.500000 | 0.300000 | 0.200000 |
| 40 | 12312 | 0.060000 | 0.700000 | 0.200000 | 0.500000 | 0.300000 | 0.200000 |
| 40 | 12321 | 0.060000 | 0.560000 | 0.200000 | 0.500000 | 0.300000 | 0.200000 |
| 40 | 12322 | 0.060000 | 0.560000 | 0.200000 | 0.500000 | 0.300000 | 0.200000 |
| 40 | 12411 | 0.060000 | 0.700000 | 0.200000 | 0.500000 | 0.300000 | 0.200000 |
| 40 | 12412 | 0.060000 | 0.700000 | 0.200000 | 0.500000 | 0.300000 | 0.200000 |
| 40 | 12421 | 0.060000 | 0.560000 | 0.200000 | 0.500000 | 0.300000 | 0.200000 |
| 40 | 12422 | 0.060000 | 0.560000 | 0.200000 | 0.500000 | 0.300000 | 0.200000 |
| 40 | 13111 | 0.100000 | 0.700000 | 0.200000 | 1.000000 | 0.300000 | 0.500000 |
| 40 | 13112 | 0.100000 | 0.700000 | 0.200000 | 1.000000 | 0.300000 | 0.500000 |
| 40 | 13121 | 0.100000 | 0.560000 | 0.200000 | 1.000000 | 0.300000 | 0.500000 |
| 40 | 13122 | 0.100000 | 0.560000 | 0.200000 | 1.000000 | 0.300000 | 0.500000 |
| 40 | 13211 | 0.100000 | 0.700000 | 0.200000 | 1.000000 | 0.300000 | 0.500000 |
| 40 | 13212 | 0.100000 | 0.700000 | 0.200000 | 1.000000 | 0.300000 | 0.500000 |
| 40 | 13221 | 0.100000 | 0.560000 | 0.200000 | 1.000000 | 0.300000 | 0.500000 |
| 40 | 13222 | 0.100000 | 0.560000 | 0.200000 | 1.000000 | 0.300000 | 0.500000 |
| 40 | 13231 | 0.100000 | 0.420000 | 0.200000 | 1.000000 | 0.300000 | 0.500000 |
| 40 | 13232 | 0.100000 | 0.420000 | 0.200000 | 1.000000 | 0.300000 | 0.500000 |
| 40 | 13311 | 0.100000 | 0.700000 | 0.200000 | 1.000000 | 0.300000 | 0.500000 |
| 40 | 13312 | 0.100000 | 0.700000 | 0.200000 | 1.000000 | 0.300000 | 0.500000 |
| 40 | 13321 | 0.100000 | 0.560000 | 0.200000 | 1.000000 | 0.300000 | 0.500000 |
| 40 | 13322 | 0.100000 | 0.560000 | 0.200000 | 1.000000 | 0.300000 | 0.500000 |

```
       40      13331  0.100000       0.420000       0.200000       1.000000       0.300000       0.500000
       40      13411  0.100000       0.700000       0.200000       1.000000       0.300000       0.500000
       40      13412  0.100000       0.700000       0.200000       1.000000       0.300000       0.500000
       40      13421  0.100000       0.560000       0.200000       1.000000       0.300000       0.500000
       40      13422  0.100000       0.560000       0.200000       1.000000       0.300000       0.500000
       40      13431  0.100000       0.420000       0.200000       1.000000       0.300000       0.500000
       40      13432  0.100000       0.420000       0.200000       1.000000       0.300000       0.500000
       40      14121  0.130000       0.850000       0.200000       1.000000       0.300000       0.700000
       40      14122  0.130000       0.850000       0.200000       1.000000       0.300000       0.700000
       40      14131  0.100000       0.680000       0.200000       1.000000       0.300000       0.700000
       40      14132  0.100000       0.680000       0.200000       1.000000       0.300000       0.700000
       40      14221  0.130000       0.850000       0.200000       1.000000       0.300000       0.700000
       40      14222  0.130000       0.850000       0.200000       1.000000       0.300000       0.700000
       40      14231  0.100000       0.680000       0.200000       1.000000       0.300000       0.700000
       40      14232  0.100000       0.680000       0.200000       1.000000       0.300000       0.700000
       40      14321  0.130000       0.850000       0.200000       1.000000       0.300000       0.700000
       40      14322  0.130000       0.850000       0.200000       1.000000       0.300000       0.700000
       40      14331  0.100000       0.680000       0.200000       1.000000       0.300000       0.700000
       40      14332  0.100000       0.680000       0.200000       1.000000       0.300000       0.700000
       40      14421  0.130000       0.850000       0.200000       1.000000       0.300000       0.700000
       40      14422  0.130000       0.850000       0.200000       1.000000       0.300000       0.700000
       40      14431  0.100000       0.680000       0.200000       1.000000       0.300000       0.700000
       40      14432  0.100000       0.680000       0.200000       1.000000       0.300000       0.700000
       40      15121  0.150000       0.850000       0.250000       1.000000       0.300000       0.700000
       40      15122  0.150000       0.850000       0.250000       1.000000       0.300000       0.700000
       40      15131  0.130000       0.680000       0.250000       1.000000       0.300000       0.700000
       40      15132  0.130000       0.680000       0.250000       1.000000       0.300000       0.700000
       40      15221  0.150000       0.850000       0.250000       1.000000       0.300000       0.700000
       40      15222  0.150000       0.850000       0.250000       1.000000       0.300000       0.700000
       40      15231  0.130000       0.680000       0.250000       1.000000       0.300000       0.700000
       40      15232  0.130000       0.680000       0.250000       1.000000       0.300000       0.700000
       40      15321  0.150000       0.850000       0.250000       1.000000       0.300000       0.700000
       40      15322  0.150000       0.850000       0.250000       1.000000       0.300000       0.700000
       40      15331  0.130000       0.680000       0.250000       1.000000       0.300000       0.700000
       40      15332  0.130000       0.680000       0.250000       1.000000       0.300000       0.700000
       40      15421  0.150000       0.850000       0.250000       1.000000       0.300000       0.700000
       40      15422  0.150000       0.850000       0.250000       1.000000       0.300000       0.700000
       40      15431  0.130000       0.680000       0.250000       1.000000       0.300000       0.700000
       40      15432  0.130000       0.680000       0.250000       1.000000       0.300000       0.700000
       40      16000  0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
c-----------------------------------------------------------------------------------------
c140 pwat-state1
c    initial conditions for the simulation
c
c    defid   parameter group id
c    deluid  landuse id
c    ceps    initial interception storage.
c    surs    initial surface (overland flow) storage.
c    uzs     initial upper zone storage.
c    ifws    initial interflow storage.
c    lzs     initial lower zone storage.
c    agws    initial active groundwater storage.
c    gwvs    initial index to groundwater slope.
c
c defid deluid ceps      surs       uzs      ifws       lzs       agws      gwvs
       33      1000   0.000000       0.000000       0.400000       0.000000       9.000000       2.000000
       0.500000
       33      2000   0.000000       0.000000       0.400000       0.000000       9.000000       2.000000
       0.500000
       33      3000   0.000000       0.000000       0.400000       0.000000       9.000000       2.000000
       0.500000
       33      4000   0.000000       0.000000       0.400000       0.000000       9.000000       2.000000
       0.500000
       33      5000   0.000000       0.000000       0.400000       0.000000       9.000000       2.000000
       0.500000
       33      6000   0.000000       0.000000       0.400000       0.000000       9.000000       2.000000
       0.500000
       33      7000   0.000000       0.000000       0.400000       0.000000       9.000000       2.000000
       0.500000
       33      8000   0.000000       0.000000       0.400000       0.000000       9.000000       2.000000
       0.500000
       33      9000   0.000000       0.000000       0.400000       0.000000       9.000000       2.000000
       0.500000
       33      10000  0.000000       0.000000       0.400000       0.000000       9.000000       2.000000
       0.500000
       33      11111  0.000000       0.000000       0.400000       0.000000       9.000000       2.000000
       0.500000
       33      11112  0.000000       0.000000       0.400000       0.000000       9.000000       2.000000
       0.500000
```

```
33      11121   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
33      11122   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
33      11211   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
33      11212   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
33      11221   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
33      11222   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
33      11311   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
33      11312   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
33      11321   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
33      11322   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
33      11411   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
33      11412   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
33      11421   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
33      11422   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
33      12111   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
33      12112   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
33      12121   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
33      12122   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
33      12211   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
33      12212   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
33      12221   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
33      12222   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
33      12311   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
33      12312   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
33      12321   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
33      12322   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
33      12411   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
33      12412   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
33      12421   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
33      12422   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
33      13111   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
33      13112   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
33      13121   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
33      13122   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
33      13211   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
33      13212   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
33      13221   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
33      13222   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
33      13231   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
```

```
33      13232   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
33      13311   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
33      13312   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
33      13321   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
33      13322   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
33      13331   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
33      13411   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
33      13412   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
33      13421   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
33      13422   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
33      13431   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
33      13432   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
33      14121   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
33      14122   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
33      14131   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
33      14132   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
33      14221   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
33      14222   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
33      14231   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
33      14232   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
33      14321   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
33      14322   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
33      14331   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
33      14332   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
33      14421   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
33      14422   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
33      14431   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
33      14432   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
33      15121   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
33      15122   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
33      15131   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
33      15132   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
33      15221   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
33      15222   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
33      15231   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
33      15232   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
33      15321   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
33      15322   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
33      15331   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
```

```
33      15332   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
33      15421   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
33      15422   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
33      15431   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
33      15432   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
33      16000   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
40      1000    0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
40      2000    0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
40      3000    0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
40      4000    0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
40      5000    0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
40      6000    0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
40      7000    0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
40      8000    0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
40      9000    0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
40      10000   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
40      11111   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
40      11112   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
40      11121   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
40      11122   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
40      11211   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
40      11212   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
40      11221   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
40      11222   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
40      11311   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
40      11312   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
40      11321   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
40      11322   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
40      11411   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
40      11412   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
40      11421   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
40      11422   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
40      12111   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
40      12112   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
40      12121   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
40      12122   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
40      12211   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
40      12212   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
40      12221   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
```

```
40      12222   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
40      12311   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
40      12312   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
40      12321   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
40      12322   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
40      12411   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
40      12412   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
40      12421   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
40      12422   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
40      13111   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
40      13112   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
40      13121   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
40      13122   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
40      13211   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
40      13212   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
40      13221   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
40      13222   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
40      13231   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
40      13232   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
40      13311   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
40      13312   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
40      13321   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
40      13322   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
40      13331   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
40      13411   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
40      13412   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
40      13421   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
40      13422   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
40      13431   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
40      13432   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
40      14121   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
40      14122   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
40      14131   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
40      14132   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
40      14221   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
40      14222   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
40      14231   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
40      14232   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
40      14321   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
```

```
        40     14322  0.000000       0.000000       0.400000       0.000000       9.000000       2.000000
        0.500000
        40     14331  0.000000       0.000000       0.400000       0.000000       9.000000       2.000000
        0.500000
        40     14332  0.000000       0.000000       0.400000       0.000000       9.000000       2.000000
        0.500000
        40     14421  0.000000       0.000000       0.400000       0.000000       9.000000       2.000000
        0.500000
        40     14422  0.000000       0.000000       0.400000       0.000000       9.000000       2.000000
        0.500000
        40     14431  0.000000       0.000000       0.400000       0.000000       9.000000       2.000000
        0.500000
        40     14432  0.000000       0.000000       0.400000       0.000000       9.000000       2.000000
        0.500000
        40     15121  0.000000       0.000000       0.400000       0.000000       9.000000       2.000000
        0.500000
        40     15122  0.000000       0.000000       0.400000       0.000000       9.000000       2.000000
        0.500000
        40     15131  0.000000       0.000000       0.400000       0.000000       9.000000       2.000000
        0.500000
        40     15132  0.000000       0.000000       0.400000       0.000000       9.000000       2.000000
        0.500000
        40     15221  0.000000       0.000000       0.400000       0.000000       9.000000       2.000000
        0.500000
        40     15222  0.000000       0.000000       0.400000       0.000000       9.000000       2.000000
        0.500000
        40     15231  0.000000       0.000000       0.400000       0.000000       9.000000       2.000000
        0.500000
        40     15232  0.000000       0.000000       0.400000       0.000000       9.000000       2.000000
        0.500000
        40     15321  0.000000       0.000000       0.400000       0.000000       9.000000       2.000000
        0.500000
        40     15322  0.000000       0.000000       0.400000       0.000000       9.000000       2.000000
        0.500000
        40     15331  0.000000       0.000000       0.400000       0.000000       9.000000       2.000000
        0.500000
        40     15332  0.000000       0.000000       0.400000       0.000000       9.000000       2.000000
        0.500000
        40     15421  0.000000       0.000000       0.400000       0.000000       9.000000       2.000000
        0.500000
        40     15422  0.000000       0.000000       0.400000       0.000000       9.000000       2.000000
        0.500000
        40     15431  0.000000       0.000000       0.400000       0.000000       9.000000       2.000000
        0.500000
        40     15432  0.000000       0.000000       0.400000       0.000000       9.000000       2.000000
        0.500000
        40     16000  0.000000       0.000000       0.400000       0.000000       9.000000       2.000000
        0.500000
c------------------------------------------------------------------------------------
c150 mon-interception storage (cepscm)
c    only required if vcsfg=1 in pwat-parm1 (see card 100)
c
c    defid   parameter group id
c    deluid  landuse id
c    jan-dec interception storage capacity at start of each month (inches)
c
c defid deluid   jan   feb   mar   apr   may   jun   jul   aug   sep   oct   nov   dec
c------------------------------------------------------------------------------------
c160 mon-upper zone nominal storage (uzsnm)
c    only required if vuzfg=1 in pwat-parm1 (see card 100)
c
c    defid   parameter group id
c    deluid  landuse id
c    jan-dec upper zone nominal storage at start of each month (inches)
c
c defid deluid   jan   feb   mar   apr   may   jun   jul   aug   sep   oct   nov   dec
c--------------------------------------------------------------------------------------
c170 mon-Manning's roughness coefficient (nsurm)
c    only required if vnnfg=1 in pwat-parm1 (see card 100)
c
c    defid   parameter group id
c    deluid  landuse id
c    jan-dec Manning's roughness coefficient at start of each month (none)
c
c defid deluid   jan   feb   mar   apr   may   jun   jul   aug   sep   oct   nov   dec
c--------------------------------------------------------------------------------------
c180 mon-interflow inflow parameter (intfwm)
c    only required if vifwfg=1 in pwat-parm1 (see card 100)
c
```

```
c    defid   parameter group id
c    deluid  landuse id
c    jan-dec interflow inflow parameter at start of each month (none)
c
c defid deluid   jan   feb   mar   apr   may   jun   jul   aug   sep   oct   nov   dec
c-------------------------------------------------------------------------------------
c190 mon-interflow recession constant (ircm)
c    only required if vircfg=1 in pwat-parm1 (see card 100)
c
c    defid   parameter group id
c    deluid  landuse id
c    jan-dec interflow recession constant at start of each month (none)
c
c defid deluid   jan   feb   mar   apr   may   jun   jul   aug   sep   oct   nov   dec
c-----------------------------------------------------------------------------------
c200 mon-lower zone evapotranspiration parameter (lzetpm)
c    only required if vlefg=1 in pwat-parm1 (see card 100)
c
c    defid   parameter group id
c    deluid  landuse id
c    jan-dec lower zone evapotranspiration parameter at start of each month (none)
c
c defid deluid   jan   feb   mar   apr   may   jun   jul   aug   sep   oct   nov   dec
c-----------------------------------------------------------------------------------
c201   Irrigation Application Option Flags
cIrrigation flag decide whether to run irrigation
c
c    irrigfg   if = 1 run irrigation option
c    petfg     if = 1 use constant PET rather than time series from the air file
c    monVaryIrrig   if = 1 use monthly varying ET coefficient
c
c irrigfg  petfg  monVaryIrrig
       1      1      1
c----------------------------------------------------------------------------------------
c202 Irrigation PET Value
c   defid        Group ID number.
c   petval       Constant PET value to calculate actual ET (in/hr)
c
c defid  petval
       33     0.500000
       40     0.500000
c-------------------------------------------------------------------------------------------
c203 Irrigation Application Options
c   defid        Group ID number.
c   deluid       Landuse ID number
c   startmonth   startmonth of irrigation requirement
c   endmonth     endmonth of irrigation requirement
c   fraction1    fraction of irrigation requirement applied over the canopy.
c   fraction2    fraction of irrigation water applied directly to the soil surface.
c   fraction3    fraction of irrigation water applied to the upper soil zone via buried systems
c   fraction4    fraction of irrigation water likewise applied to the lower soil zone.
c   fraction5    fraction of irrigation water entering directly into the local groundwater, such as seepage
irrigation.
c   etcoeff      Coefficient to calculate actual ET, based on PET.
c   etdays       Number of threshold days to calculate irrigation demand (pet*etcoeff - precip)
c                (if etdays = 0 then irrigation demand = pet * etcoeff)
c
c defid deluid startmonth endmonth fraction1 fraction2 fraction3 fraction4 fraction5 etcoeff etdays
       33     1000   1      12     0.000000      0.000000      0.000000      0.000000      0.000000
       1.000000      0
       33     2000   1      12     0.000000      0.000000      0.000000      0.000000      0.000000
       1.000000      0
       33     3000   1      12     0.000000      0.000000      0.000000      0.000000      0.000000
       1.000000      0
       33     4000   1      12     0.000000      0.000000      0.000000      0.000000      0.000000
       1.000000      0
       33     5000   1      12     0.000000      0.000000      0.000000      0.000000      0.000000
       1.000000      0
       33     6000   1      12     0.000000      0.000000      0.000000      0.000000      0.000000
       1.000000      0
       33     7000   1      12     0.000000      0.000000      0.000000      0.000000      0.000000
       1.000000      0
       33     8000   1      12     0.000000      0.000000      0.000000      0.000000      0.000000
       1.000000      0
       33     9000   1      12     0.000000      0.000000      0.000000      0.000000      0.000000
       1.000000      0
       33     10000  1      12     1.000000      0.000000      0.000000      0.000000      0.000000
       1.000000      0
```

```
33      11111   1       12      1.000000        0.000000        0.000000        0.000000        0.000000
1.000000        0
33      11112   1       12      1.000000        0.000000        0.000000        0.000000        0.000000
1.000000        0
33      11121   1       12      1.000000        0.000000        0.000000        0.000000        0.000000
1.000000        0
33      11122   1       12      1.000000        0.000000        0.000000        0.000000        0.000000
1.000000        0
33      11211   1       12      1.000000        0.000000        0.000000        0.000000        0.000000
1.000000        0
33      11212   1       12      1.000000        0.000000        0.000000        0.000000        0.000000
1.000000        0
33      11221   1       12      1.000000        0.000000        0.000000        0.000000        0.000000
1.000000        0
33      11222   1       12      1.000000        0.000000        0.000000        0.000000        0.000000
1.000000        0
33      11311   1       12      1.000000        0.000000        0.000000        0.000000        0.000000
1.000000        0
33      11312   1       12      1.000000        0.000000        0.000000        0.000000        0.000000
1.000000        0
33      11321   1       12      1.000000        0.000000        0.000000        0.000000        0.000000
1.000000        0
33      11322   1       12      1.000000        0.000000        0.000000        0.000000        0.000000
1.000000        0
33      11411   1       12      1.000000        0.000000        0.000000        0.000000        0.000000
1.000000        0
33      11412   1       12      1.000000        0.000000        0.000000        0.000000        0.000000
1.000000        0
33      11421   1       12      1.000000        0.000000        0.000000        0.000000        0.000000
1.000000        0
33      11422   1       12      1.000000        0.000000        0.000000        0.000000        0.000000
1.000000        0
33      12111   1       12      0.000000        0.000000        0.000000        0.000000        0.000000
1.000000        0
33      12112   1       12      0.000000        0.000000        0.000000        0.000000        0.000000
1.000000        0
33      12121   1       12      0.000000        0.000000        0.000000        0.000000        0.000000
1.000000        0
33      12122   1       12      0.000000        0.000000        0.000000        0.000000        0.000000
1.000000        0
33      12211   1       12      0.000000        0.000000        0.000000        0.000000        0.000000
1.000000        0
33      12212   1       12      0.000000        0.000000        0.000000        0.000000        0.000000
1.000000        0
33      12221   1       12      0.000000        0.000000        0.000000        0.000000        0.000000
1.000000        0
33      12222   1       12      0.000000        0.000000        0.000000        0.000000        0.000000
1.000000        0
33      12311   1       12      0.000000        0.000000        0.000000        0.000000        0.000000
1.000000        0
33      12312   1       12      0.000000        0.000000        0.000000        0.000000        0.000000
1.000000        0
33      12321   1       12      0.000000        0.000000        0.000000        0.000000        0.000000
1.000000        0
33      12322   1       12      0.000000        0.000000        0.000000        0.000000        0.000000
1.000000        0
33      12411   1       12      0.000000        0.000000        0.000000        0.000000        0.000000
1.000000        0
33      12412   1       12      0.000000        0.000000        0.000000        0.000000        0.000000
1.000000        0
33      12421   1       12      0.000000        0.000000        0.000000        0.000000        0.000000
1.000000        0
33      12422   1       12      0.000000        0.000000        0.000000        0.000000        0.000000
1.000000        0
33      13111   1       12      0.000000        0.000000        0.000000        0.000000        0.000000
1.000000        0
33      13112   1       12      0.000000        0.000000        0.000000        0.000000        0.000000
1.000000        0
33      13121   1       12      0.000000        0.000000        0.000000        0.000000        0.000000
1.000000        0
33      13122   1       12      0.000000        0.000000        0.000000        0.000000        0.000000
1.000000        0
33      13211   1       12      0.000000        0.000000        0.000000        0.000000        0.000000
1.000000        0
33      13212   1       12      0.000000        0.000000        0.000000        0.000000        0.000000
1.000000        0
33      13221   1       12      0.000000        0.000000        0.000000        0.000000        0.000000
1.000000        0
```

```
33     13222   1      12      0.000000       0.000000       0.000000       0.000000       0.000000
1.000000       0
33     13231   1      12      0.000000       0.000000       0.000000       0.000000       0.000000
1.000000       0
33     13232   1      12      0.000000       0.000000       0.000000       0.000000       0.000000
1.000000       0
33     13311   1      12      0.000000       0.000000       0.000000       0.000000       0.000000
1.000000       0
33     13312   1      12      0.000000       0.000000       0.000000       0.000000       0.000000
1.000000       0
33     13321   1      12      0.000000       0.000000       0.000000       0.000000       0.000000
1.000000       0
33     13322   1      12      0.000000       0.000000       0.000000       0.000000       0.000000
1.000000       0
33     13331   1      12      0.000000       0.000000       0.000000       0.000000       0.000000
1.000000       0
33     13411   1      12      0.000000       0.000000       0.000000       0.000000       0.000000
1.000000       0
33     13412   1      12      0.000000       0.000000       0.000000       0.000000       0.000000
1.000000       0
33     13421   1      12      0.000000       0.000000       0.000000       0.000000       0.000000
1.000000       0
33     13422   1      12      0.000000       0.000000       0.000000       0.000000       0.000000
1.000000       0
33     13431   1      12      0.000000       0.000000       0.000000       0.000000       0.000000
1.000000       0
33     13432   1      12      0.000000       0.000000       0.000000       0.000000       0.000000
1.000000       0
33     14121   1      12      0.000000       0.000000       0.000000       0.000000       0.000000
1.000000       0
33     14122   1      12      0.000000       0.000000       0.000000       0.000000       0.000000
1.000000       0
33     14131   1      12      0.000000       0.000000       0.000000       0.000000       0.000000
1.000000       0
33     14132   1      12      0.000000       0.000000       0.000000       0.000000       0.000000
1.000000       0
33     14221   1      12      0.000000       0.000000       0.000000       0.000000       0.000000
1.000000       0
33     14222   1      12      0.000000       0.000000       0.000000       0.000000       0.000000
1.000000       0
33     14231   1      12      0.000000       0.000000       0.000000       0.000000       0.000000
1.000000       0
33     14232   1      12      0.000000       0.000000       0.000000       0.000000       0.000000
1.000000       0
33     14321   1      12      0.000000       0.000000       0.000000       0.000000       0.000000
1.000000       0
33     14322   1      12      0.000000       0.000000       0.000000       0.000000       0.000000
1.000000       0
33     14331   1      12      0.000000       0.000000       0.000000       0.000000       0.000000
1.000000       0
33     14332   1      12      0.000000       0.000000       0.000000       0.000000       0.000000
1.000000       0
33     14421   1      12      0.000000       0.000000       0.000000       0.000000       0.000000
1.000000       0
33     14422   1      12      0.000000       0.000000       0.000000       0.000000       0.000000
1.000000       0
33     14431   1      12      0.000000       0.000000       0.000000       0.000000       0.000000
1.000000       0
33     14432   1      12      0.000000       0.000000       0.000000       0.000000       0.000000
1.000000       0
33     15121   1      12      0.000000       0.000000       0.000000       0.000000       0.000000
1.000000       0
33     15122   1      12      0.000000       0.000000       0.000000       0.000000       0.000000
1.000000       0
33     15131   1      12      0.000000       0.000000       0.000000       0.000000       0.000000
1.000000       0
33     15132   1      12      0.000000       0.000000       0.000000       0.000000       0.000000
1.000000       0
33     15221   1      12      0.000000       0.000000       0.000000       0.000000       0.000000
1.000000       0
33     15222   1      12      0.000000       0.000000       0.000000       0.000000       0.000000
1.000000       0
33     15231   1      12      0.000000       0.000000       0.000000       0.000000       0.000000
1.000000       0
33     15232   1      12      0.000000       0.000000       0.000000       0.000000       0.000000
1.000000       0
33     15321   1      12      0.000000       0.000000       0.000000       0.000000       0.000000
1.000000       0
```

```
33      15322   1       12      0.000000        0.000000        0.000000        0.000000        0.000000
1.000000        0
33      15331   1       12      0.000000        0.000000        0.000000        0.000000        0.000000
1.000000        0
33      15332   1       12      0.000000        0.000000        0.000000        0.000000        0.000000
1.000000        0
33      15421   1       12      0.000000        0.000000        0.000000        0.000000        0.000000
1.000000        0
33      15422   1       12      0.000000        0.000000        0.000000        0.000000        0.000000
1.000000        0
33      15431   1       12      0.000000        0.000000        0.000000        0.000000        0.000000
1.000000        0
33      15432   1       12      0.000000        0.000000        0.000000        0.000000        0.000000
1.000000        0
33      16000   1       12      0.000000        0.000000        0.000000        0.000000        0.000000
1.000000        0
40      1000    1       12      0.000000        0.000000        0.000000        0.000000        0.000000
1.000000        0
40      2000    1       12      0.000000        0.000000        0.000000        0.000000        0.000000
1.000000        0
40      3000    1       12      0.000000        0.000000        0.000000        0.000000        0.000000
1.000000        0
40      4000    1       12      0.000000        0.000000        0.000000        0.000000        0.000000
1.000000        0
40      5000    1       12      0.000000        0.000000        0.000000        0.000000        0.000000
1.000000        0
40      6000    1       12      0.000000        0.000000        0.000000        0.000000        0.000000
1.000000        0
40      7000    1       12      0.000000        0.000000        0.000000        0.000000        0.000000
1.000000        0
40      8000    1       12      0.000000        0.000000        0.000000        0.000000        0.000000
1.000000        0
40      9000    1       12      0.000000        0.000000        0.000000        0.000000        0.000000
1.000000        0
40      10000   1       12      1.000000        0.000000        0.000000        0.000000        0.000000
1.000000        0
40      11111   1       12      1.000000        0.000000        0.000000        0.000000        0.000000
1.000000        0
40      11112   1       12      1.000000        0.000000        0.000000        0.000000        0.000000
1.000000        0
40      11121   1       12      1.000000        0.000000        0.000000        0.000000        0.000000
1.000000        0
40      11122   1       12      1.000000        0.000000        0.000000        0.000000        0.000000
1.000000        0
40      11211   1       12      1.000000        0.000000        0.000000        0.000000        0.000000
1.000000        0
40      11212   1       12      1.000000        0.000000        0.000000        0.000000        0.000000
1.000000        0
40      11221   1       12      1.000000        0.000000        0.000000        0.000000        0.000000
1.000000        0
40      11222   1       12      1.000000        0.000000        0.000000        0.000000        0.000000
1.000000        0
40      11311   1       12      1.000000        0.000000        0.000000        0.000000        0.000000
1.000000        0
40      11312   1       12      1.000000        0.000000        0.000000        0.000000        0.000000
1.000000        0
40      11321   1       12      1.000000        0.000000        0.000000        0.000000        0.000000
1.000000        0
40      11322   1       12      1.000000        0.000000        0.000000        0.000000        0.000000
1.000000        0
40      11411   1       12      1.000000        0.000000        0.000000        0.000000        0.000000
1.000000        0
40      11412   1       12      1.000000        0.000000        0.000000        0.000000        0.000000
1.000000        0
40      11421   1       12      1.000000        0.000000        0.000000        0.000000        0.000000
1.000000        0
40      11422   1       12      1.000000        0.000000        0.000000        0.000000        0.000000
1.000000        0
40      12111   1       12      0.000000        0.000000        0.000000        0.000000        0.000000
1.000000        0
40      12112   1       12      0.000000        0.000000        0.000000        0.000000        0.000000
1.000000        0
40      12121   1       12      0.000000        0.000000        0.000000        0.000000        0.000000
1.000000        0
40      12122   1       12      0.000000        0.000000        0.000000        0.000000        0.000000
1.000000        0
40      12211   1       12      0.000000        0.000000        0.000000        0.000000        0.000000
1.000000        0
```

```
40      12212   1       12      0.000000        0.000000        0.000000        0.000000        0.000000
1.000000        0
40      12221   1       12      0.000000        0.000000        0.000000        0.000000        0.000000
1.000000        0
40      12222   1       12      0.000000        0.000000        0.000000        0.000000        0.000000
1.000000        0
40      12311   1       12      0.000000        0.000000        0.000000        0.000000        0.000000
1.000000        0
40      12312   1       12      0.000000        0.000000        0.000000        0.000000        0.000000
1.000000        0
40      12321   1       12      0.000000        0.000000        0.000000        0.000000        0.000000
1.000000        0
40      12322   1       12      0.000000        0.000000        0.000000        0.000000        0.000000
1.000000        0
40      12411   1       12      0.000000        0.000000        0.000000        0.000000        0.000000
1.000000        0
40      12412   1       12      0.000000        0.000000        0.000000        0.000000        0.000000
1.000000        0
40      12421   1       12      0.000000        0.000000        0.000000        0.000000        0.000000
1.000000        0
40      12422   1       12      0.000000        0.000000        0.000000        0.000000        0.000000
1.000000        0
40      13111   1       12      0.000000        0.000000        0.000000        0.000000        0.000000
1.000000        0
40      13112   1       12      0.000000        0.000000        0.000000        0.000000        0.000000
1.000000        0
40      13121   1       12      0.000000        0.000000        0.000000        0.000000        0.000000
1.000000        0
40      13122   1       12      0.000000        0.000000        0.000000        0.000000        0.000000
1.000000        0
40      13211   1       12      0.000000        0.000000        0.000000        0.000000        0.000000
1.000000        0
40      13212   1       12      0.000000        0.000000        0.000000        0.000000        0.000000
1.000000        0
40      13221   1       12      0.000000        0.000000        0.000000        0.000000        0.000000
1.000000        0
40      13222   1       12      0.000000        0.000000        0.000000        0.000000        0.000000
1.000000        0
40      13231   1       12      0.000000        0.000000        0.000000        0.000000        0.000000
1.000000        0
40      13232   1       12      0.000000        0.000000        0.000000        0.000000        0.000000
1.000000        0
40      13311   1       12      0.000000        0.000000        0.000000        0.000000        0.000000
1.000000        0
40      13312   1       12      0.000000        0.000000        0.000000        0.000000        0.000000
1.000000        0
40      13321   1       12      0.000000        0.000000        0.000000        0.000000        0.000000
1.000000        0
40      13322   1       12      0.000000        0.000000        0.000000        0.000000        0.000000
1.000000        0
40      13331   1       12      0.000000        0.000000        0.000000        0.000000        0.000000
1.000000        0
40      13411   1       12      0.000000        0.000000        0.000000        0.000000        0.000000
1.000000        0
40      13412   1       12      0.000000        0.000000        0.000000        0.000000        0.000000
1.000000        0
40      13421   1       12      0.000000        0.000000        0.000000        0.000000        0.000000
1.000000        0
40      13422   1       12      0.000000        0.000000        0.000000        0.000000        0.000000
1.000000        0
40      13431   1       12      0.000000        0.000000        0.000000        0.000000        0.000000
1.000000        0
40      13432   1       12      0.000000        0.000000        0.000000        0.000000        0.000000
1.000000        0
40      14121   1       12      0.000000        0.000000        0.000000        0.000000        0.000000
1.000000        0
40      14122   1       12      0.000000        0.000000        0.000000        0.000000        0.000000
1.000000        0
40      14131   1       12      0.000000        0.000000        0.000000        0.000000        0.000000
1.000000        0
40      14132   1       12      0.000000        0.000000        0.000000        0.000000        0.000000
1.000000        0
40      14221   1       12      0.000000        0.000000        0.000000        0.000000        0.000000
1.000000        0
40      14222   1       12      0.000000        0.000000        0.000000        0.000000        0.000000
1.000000        0
40      14231   1       12      0.000000        0.000000        0.000000        0.000000        0.000000
1.000000        0
```

```
       40      14232  1       12      0.000000       0.000000       0.000000       0.000000       0.000000
       1.000000       0
       40      14321  1       12      0.000000       0.000000       0.000000       0.000000       0.000000
       1.000000       0
       40      14322  1       12      0.000000       0.000000       0.000000       0.000000       0.000000
       1.000000       0
       40      14331  1       12      0.000000       0.000000       0.000000       0.000000       0.000000
       1.000000       0
       40      14332  1       12      0.000000       0.000000       0.000000       0.000000       0.000000
       1.000000       0
       40      14421  1       12      0.000000       0.000000       0.000000       0.000000       0.000000
       1.000000       0
       40      14422  1       12      0.000000       0.000000       0.000000       0.000000       0.000000
       1.000000       0
       40      14431  1       12      0.000000       0.000000       0.000000       0.000000       0.000000
       1.000000       0
       40      14432  1       12      0.000000       0.000000       0.000000       0.000000       0.000000
       1.000000       0
       40      15121  1       12      0.000000       0.000000       0.000000       0.000000       0.000000
       1.000000       0
       40      15122  1       12      0.000000       0.000000       0.000000       0.000000       0.000000
       1.000000       0
       40      15131  1       12      0.000000       0.000000       0.000000       0.000000       0.000000
       1.000000       0
       40      15132  1       12      0.000000       0.000000       0.000000       0.000000       0.000000
       1.000000       0
       40      15221  1       12      0.000000       0.000000       0.000000       0.000000       0.000000
       1.000000       0
       40      15222  1       12      0.000000       0.000000       0.000000       0.000000       0.000000
       1.000000       0
       40      15231  1       12      0.000000       0.000000       0.000000       0.000000       0.000000
       1.000000       0
       40      15232  1       12      0.000000       0.000000       0.000000       0.000000       0.000000
       1.000000       0
       40      15321  1       12      0.000000       0.000000       0.000000       0.000000       0.000000
       1.000000       0
       40      15322  1       12      0.000000       0.000000       0.000000       0.000000       0.000000
       1.000000       0
       40      15331  1       12      0.000000       0.000000       0.000000       0.000000       0.000000
       1.000000       0
       40      15332  1       12      0.000000       0.000000       0.000000       0.000000       0.000000
       1.000000       0
       40      15421  1       12      0.000000       0.000000       0.000000       0.000000       0.000000
       1.000000       0
       40      15422  1       12      0.000000       0.000000       0.000000       0.000000       0.000000
       1.000000       0
       40      15431  1       12      0.000000       0.000000       0.000000       0.000000       0.000000
       1.000000       0
       40      15432  1       12      0.000000       0.000000       0.000000       0.000000       0.000000
       1.000000       0
       40      16000  1       12      0.000000       0.000000       0.000000       0.000000       0.000000
       1.000000       0
c-------------------------------------------------------------------------------------------
c204 Monthly-variable ET coefficients
c   defid        Group ID number.
c   deluid       Landuse ID number
c   monetcs      Monthly-variable coefficient to calculate actual ET for Jan..Dec
c
c defid deluid monETCs1 monETCs2 monETCs3 monETCs4 monETCs5 monETCs6 monETCs7 monETCs8 monETCs9 monETCs10
monETCs11 monETCs12
       33      1000   0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
       0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
       33      2000   0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
       0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
       33      3000   0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
       0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
       33      4000   0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
       0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
       33      5000   0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
       0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
       33      6000   0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
       0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
       33      7000   0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
       0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
       33      8000   0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
       0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
       33      9000   0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
       0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
```

```
33      10000  0.000569       0.001419       0.001327       0.005918       0.006185       0.011507
0.012554       0.013237       0.011520       0.009339       0.006252       0.000000
33      11111  0.000569       0.001419       0.001327       0.005918       0.006185       0.011507
0.012554       0.013237       0.011520       0.009339       0.006252       0.000000
33      11112  0.000569       0.001419       0.001327       0.005918       0.006185       0.011507
0.012554       0.013237       0.011520       0.009339       0.006252       0.000000
33      11121  0.000569       0.001419       0.001327       0.005918       0.006185       0.011507
0.012554       0.013237       0.011520       0.009339       0.006252       0.000000
33      11122  0.000569       0.001419       0.001327       0.005918       0.006185       0.011507
0.012554       0.013237       0.011520       0.009339       0.006252       0.000000
33      11211  0.000569       0.001419       0.001327       0.005918       0.006185       0.011507
0.012554       0.013237       0.011520       0.009339       0.006252       0.000000
33      11212  0.000569       0.001419       0.001327       0.005918       0.006185       0.011507
0.012554       0.013237       0.011520       0.009339       0.006252       0.000000
33      11221  0.000569       0.001419       0.001327       0.005918       0.006185       0.011507
0.012554       0.013237       0.011520       0.009339       0.006252       0.000000
33      11222  0.000569       0.001419       0.001327       0.005918       0.006185       0.011507
0.012554       0.013237       0.011520       0.009339       0.006252       0.000000
33      11311  0.000569       0.001419       0.001327       0.005918       0.006185       0.011507
0.012554       0.013237       0.011520       0.009339       0.006252       0.000000
33      11312  0.000569       0.001419       0.001327       0.005918       0.006185       0.011507
0.012554       0.013237       0.011520       0.009339       0.006252       0.000000
33      11321  0.000569       0.001419       0.001327       0.005918       0.006185       0.011507
0.012554       0.013237       0.011520       0.009339       0.006252       0.000000
33      11322  0.000569       0.001419       0.001327       0.005918       0.006185       0.011507
0.012554       0.013237       0.011520       0.009339       0.006252       0.000000
33      11411  0.000569       0.001419       0.001327       0.005918       0.006185       0.011507
0.012554       0.013237       0.011520       0.009339       0.006252       0.000000
33      11412  0.000569       0.001419       0.001327       0.005918       0.006185       0.011507
0.012554       0.013237       0.011520       0.009339       0.006252       0.000000
33      11421  0.000569       0.001419       0.001327       0.005918       0.006185       0.011507
0.012554       0.013237       0.011520       0.009339       0.006252       0.000000
33      11422  0.000569       0.001419       0.001327       0.005918       0.006185       0.011507
0.012554       0.013237       0.011520       0.009339       0.006252       0.000000
33      12111  0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
33      12112  0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
33      12121  0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
33      12122  0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
33      12211  0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
33      12212  0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
33      12221  0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
33      12222  0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
33      12311  0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
33      12312  0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
33      12321  0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
33      12322  0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
33      12411  0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
33      12412  0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
33      12421  0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
33      12422  0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
33      13111  0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
33      13112  0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
33      13121  0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
33      13122  0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
33      13211  0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
33      13212  0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
```

```
33     13221   0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
33     13222   0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
33     13231   0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
33     13232   0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
33     13311   0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
33     13312   0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
33     13321   0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
33     13322   0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
33     13331   0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
33     13411   0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
33     13412   0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
33     13421   0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
33     13422   0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
33     13431   0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
33     13432   0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
33     14121   0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
33     14122   0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
33     14131   0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
33     14132   0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
33     14221   0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
33     14222   0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
33     14231   0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
33     14232   0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
33     14321   0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
33     14322   0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
33     14331   0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
33     14332   0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
33     14421   0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
33     14422   0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
33     14431   0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
33     14432   0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
33     15121   0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
33     15122   0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
33     15131   0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
33     15132   0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
33     15221   0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
33     15222   0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
33     15231   0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
33     15232   0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
```

```
33     15321  0.000000     0.000000     0.000000     0.000000     0.000000     0.000000
0.000000     0.000000     0.000000     0.000000     0.000000     0.000000
33     15322  0.000000     0.000000     0.000000     0.000000     0.000000     0.000000
0.000000     0.000000     0.000000     0.000000     0.000000     0.000000
33     15331  0.000000     0.000000     0.000000     0.000000     0.000000     0.000000
0.000000     0.000000     0.000000     0.000000     0.000000     0.000000
33     15332  0.000000     0.000000     0.000000     0.000000     0.000000     0.000000
0.000000     0.000000     0.000000     0.000000     0.000000     0.000000
33     15421  0.000000     0.000000     0.000000     0.000000     0.000000     0.000000
0.000000     0.000000     0.000000     0.000000     0.000000     0.000000
33     15422  0.000000     0.000000     0.000000     0.000000     0.000000     0.000000
0.000000     0.000000     0.000000     0.000000     0.000000     0.000000
33     15431  0.000000     0.000000     0.000000     0.000000     0.000000     0.000000
0.000000     0.000000     0.000000     0.000000     0.000000     0.000000
33     15432  0.000000     0.000000     0.000000     0.000000     0.000000     0.000000
0.000000     0.000000     0.000000     0.000000     0.000000     0.000000
33     16000  0.000000     0.000000     0.000000     0.000000     0.000000     0.000000
0.000000     0.000000     0.000000     0.000000     0.000000     0.000000
40     1000   0.000000     0.000000     0.000000     0.000000     0.000000     0.000000
0.000000     0.000000     0.000000     0.000000     0.000000     0.000000
40     2000   0.000000     0.000000     0.000000     0.000000     0.000000     0.000000
0.000000     0.000000     0.000000     0.000000     0.000000     0.000000
40     3000   0.000000     0.000000     0.000000     0.000000     0.000000     0.000000
0.000000     0.000000     0.000000     0.000000     0.000000     0.000000
40     4000   0.000000     0.000000     0.000000     0.000000     0.000000     0.000000
0.000000     0.000000     0.000000     0.000000     0.000000     0.000000
40     5000   0.000000     0.000000     0.000000     0.000000     0.000000     0.000000
0.000000     0.000000     0.000000     0.000000     0.000000     0.000000
40     6000   0.000000     0.000000     0.000000     0.000000     0.000000     0.000000
0.000000     0.000000     0.000000     0.000000     0.000000     0.000000
40     7000   0.000000     0.000000     0.000000     0.000000     0.000000     0.000000
0.000000     0.000000     0.000000     0.000000     0.000000     0.000000
40     8000   0.000000     0.000000     0.000000     0.000000     0.000000     0.000000
0.000000     0.000000     0.000000     0.000000     0.000000     0.000000
40     9000   0.000000     0.000000     0.000000     0.000000     0.000000     0.000000
0.000000     0.000000     0.000000     0.000000     0.000000     0.000000
40     10000  0.000569     0.001419     0.001327     0.005918     0.006185     0.011507
0.012554     0.013237     0.011520     0.009339     0.006252     0.000000
40     11111  0.000569     0.001419     0.001327     0.005918     0.006185     0.011507
0.012554     0.013237     0.011520     0.009339     0.006252     0.000000
40     11112  0.000569     0.001419     0.001327     0.005918     0.006185     0.011507
0.012554     0.013237     0.011520     0.009339     0.006252     0.000000
40     11121  0.000569     0.001419     0.001327     0.005918     0.006185     0.011507
0.012554     0.013237     0.011520     0.009339     0.006252     0.000000
40     11122  0.000569     0.001419     0.001327     0.005918     0.006185     0.011507
0.012554     0.013237     0.011520     0.009339     0.006252     0.000000
40     11211  0.000569     0.001419     0.001327     0.005918     0.006185     0.011507
0.012554     0.013237     0.011520     0.009339     0.006252     0.000000
40     11212  0.000569     0.001419     0.001327     0.005918     0.006185     0.011507
0.012554     0.013237     0.011520     0.009339     0.006252     0.000000
40     11221  0.000569     0.001419     0.001327     0.005918     0.006185     0.011507
0.012554     0.013237     0.011520     0.009339     0.006252     0.000000
40     11222  0.000569     0.001419     0.001327     0.005918     0.006185     0.011507
0.012554     0.013237     0.011520     0.009339     0.006252     0.000000
40     11311  0.000569     0.001419     0.001327     0.005918     0.006185     0.011507
0.012554     0.013237     0.011520     0.009339     0.006252     0.000000
40     11312  0.000569     0.001419     0.001327     0.005918     0.006185     0.011507
0.012554     0.013237     0.011520     0.009339     0.006252     0.000000
40     11321  0.000569     0.001419     0.001327     0.005918     0.006185     0.011507
0.012554     0.013237     0.011520     0.009339     0.006252     0.000000
40     11322  0.000569     0.001419     0.001327     0.005918     0.006185     0.011507
0.012554     0.013237     0.011520     0.009339     0.006252     0.000000
40     11411  0.000569     0.001419     0.001327     0.005918     0.006185     0.011507
0.012554     0.013237     0.011520     0.009339     0.006252     0.000000
40     11412  0.000569     0.001419     0.001327     0.005918     0.006185     0.011507
0.012554     0.013237     0.011520     0.009339     0.006252     0.000000
40     11421  0.000569     0.001419     0.001327     0.005918     0.006185     0.011507
0.012554     0.013237     0.011520     0.009339     0.006252     0.000000
40     11422  0.000569     0.001419     0.001327     0.005918     0.006185     0.011507
0.012554     0.013237     0.011520     0.009339     0.006252     0.000000
40     12111  0.000000     0.000000     0.000000     0.000000     0.000000     0.000000
0.000000     0.000000     0.000000     0.000000     0.000000     0.000000
40     12112  0.000000     0.000000     0.000000     0.000000     0.000000     0.000000
0.000000     0.000000     0.000000     0.000000     0.000000     0.000000
40     12121  0.000000     0.000000     0.000000     0.000000     0.000000     0.000000
0.000000     0.000000     0.000000     0.000000     0.000000     0.000000
40     12122  0.000000     0.000000     0.000000     0.000000     0.000000     0.000000
0.000000     0.000000     0.000000     0.000000     0.000000     0.000000
```

```
40      12211  0.000000       0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
40      12212  0.000000       0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
40      12221  0.000000       0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
40      12222  0.000000       0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
40      12311  0.000000       0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
40      12312  0.000000       0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
40      12321  0.000000       0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
40      12322  0.000000       0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
40      12411  0.000000       0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
40      12412  0.000000       0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
40      12421  0.000000       0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
40      12422  0.000000       0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
40      13111  0.000000       0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
40      13112  0.000000       0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
40      13121  0.000000       0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
40      13122  0.000000       0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
40      13211  0.000000       0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
40      13212  0.000000       0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
40      13221  0.000000       0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
40      13222  0.000000       0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
40      13231  0.000000       0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
40      13232  0.000000       0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
40      13311  0.000000       0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
40      13312  0.000000       0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
40      13321  0.000000       0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
40      13322  0.000000       0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
40      13331  0.000000       0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
40      13411  0.000000       0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
40      13412  0.000000       0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
40      13421  0.000000       0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
40      13422  0.000000       0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
40      13431  0.000000       0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
40      13432  0.000000       0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
40      14121  0.000000       0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
40      14122  0.000000       0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
40      14131  0.000000       0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
40      14132  0.000000       0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
40      14221  0.000000       0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
40      14222  0.000000       0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
```

```
        40     14231   0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
        0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
        40     14232   0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
        0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
        40     14321   0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
        0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
        40     14322   0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
        0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
        40     14331   0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
        0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
        40     14332   0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
        0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
        40     14421   0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
        0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
        40     14422   0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
        0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
        40     14431   0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
        0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
        40     14432   0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
        0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
        40     15121   0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
        0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
        40     15122   0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
        0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
        40     15131   0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
        0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
        40     15132   0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
        0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
        40     15221   0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
        0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
        40     15222   0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
        0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
        40     15231   0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
        0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
        40     15232   0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
        0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
        40     15321   0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
        0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
        40     15322   0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
        0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
        40     15331   0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
        0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
        40     15332   0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
        0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
        40     15421   0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
        0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
        40     15422   0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
        0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
        40     15431   0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
        0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
        40     15432   0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
        0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
        40     16000   0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
        0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
c---------------------------------------------------------------------------------------------
c205 Irrigation Withdrawal Options
c Irrigation withdrawal information for each watershed
c    subbasin    subbasin id
c    rchid       reach id from where water is withdrawn (if reach does not exist then
c                etdemand is assumed to be satisfied from an external source)
c    irrigdep    depth of irrigation withdrawal pipe (ft)
c
c subbasin rchid
        6665   0      0.000000
        6671   0      0.000000
        6673   0      0.000000
        6674   0      0.000000
        6675   0      0.000000
        6684   0      0.000000
        6839   0      0.000000
        6844   0      0.000000
        6850   0      0.000000
        6856   0      0.000000
        6859   0      0.000000
        6861   0      0.000000
c---------------------------------------------------------------------------------------------
c250 general quality constituent control
c
c    defid    parameter group id
```

```
c    dwqid    general quality id
c    qname    name of qual (must be a continuous string)
c    qunit    units for quality constituent output (mg/l), (ug/l), or (#/100ml)
c    qsdfg    if = 0 no sediment associated qual
c       if = 1 sediment associated in pervious/impervious land (qsdfg should be > 0 in card 281)
c       if = 2 sediment associated in pervious/impervious land
c              and sediment associated qual is added to the dissolved part
c    gqsdfg   if = 0 general quality constituent
c             if = 1 general quality constituent simulated as a sediment (only one qual can be simulated as a
sediment in each group)
c    qsofg    if = 1 then then accumulation and removal occur daily
c             if = 2 then then accumulation and removal occur every interval
c    potfcfg  if = 1 then apply background concentration potency factor (card 260) to only surface output
c             if = 2 then apply background concentration potency factor (card 260) to total land output
c
c defid dwqid   qname  qunit  qsdfg  gqsdfg  qsofg  potfcfg
       33      3      TN      (mg/l) 0      0       2      1
       33      7      TP      (mg/l) 2      0       2      1
       33      10     TCd     (ug/l) 2      0       2      1
       33      11     TCu     (ug/l) 2      0       2      1
       33      12     TPb     (ug/l) 2      0       2      1
       33      14     TZn     (ug/l) 2      0       2      1
       40      3      TN      (mg/l) 0      0       2      1
       40      7      TP      (mg/l) 2      0       2      1
       40      10     TCd     (ug/l) 2      0       2      1
       40      11     TCu     (ug/l) 2      0       2      1
       40      12     TPb     (ug/l) 2      0       2      1
       40      14     TZn     (ug/l) 2      0       2      1
c-----------------------------------------------------------------------------------------------------------
C255 subsurface quality control
c
c    (value of 0 = use constant qual-input; 1 = use corresponding monthly variable card)
c
c    vqofg       if = 1 the accumulation rate and limiting storage of QUALOF varies monthly   (cards 270, 271)
c    qsowfg      if = 1 the constituent is a QUALSURO (surface flow associated).
c    vsqcfg      if = 1 the concentration of this constituent in surface outflow varies monthly   (card 272)= 1
read table 272
c    qifwfg      if = 1 the constituent is a QUALIF (interflow associated).
c    viqcfg      if = 1 the concentration of this constituent in interflow outflow varies monthly   (card 273)=
1 read table 273
c    qagwfg      if = 1 the constituent is a QUALGW (groundwater associated).
c    vaqcfg      if = 1 the concentration of this constituent in groundwater outflow varies monthly (card 274)
c    adfglnd     if = 1 atmosperic deposition on land
c    maddfglnd   if = 1 atmosperic dry deposition varies monthly on land (card 275)
c    mawdfglnd   if = 1 atmosperic wet deposition varies monthly on land (card 276)
c
c vqofg  qsowfg  vsqcfg  qifwfg  viqcfg  qagwfg  vaqcfg  adfglnd  maddfglnd  mawdfglnd
        0      1       0      1       0      1       0      1       0      0
c-----------------------------------------------------------------------------------------------------------
C260  qual-input
c    storage on surface and nonseasonal parameters
c
c    defid   parameter group id
c    dwqid   general quality id
c    deluid  landuse id
c    sqo     initial storage of QUALOF on surface (lb or #)
c    potfw   washoff potency factor if qsdfg > 0, card 250 (lb or #)/ton-sediment
c    potfs   scour potency pactor if qsdfg > 0, card 250 (lb or #)/ton-sediment
c    potfc   background concentration potency pactor if qsdfg > 0, card 250 (lb or #)/ton-sediment
c    acqop   accumulation rate of QUALOF on surface (lb or #)/acre/day
c    sqolim  maximum storage of QUALOF on surface (lb or #)/acre
c    wsqop   rate of surface runoff that removes 90% of stored QUALOF per hour (in/hr)
c    soqc    concentration of constituent in surface outflow (mg/l), (ug/l), or (#/100ml)
c    ioqc    concentration of constituent in interflow outflow (mg/l), (ug/l), or (#/100ml)
c    aoqc    concentration of constituent in groundwater outflow (mg/l), (ug/l), or (#/100ml)
c    addc    atmospheric dry deposition flux (lb/acre/day or #/acre/day)
c    awdc    atmospheric wet deposition concentration (mg/l), (ug/l), or (#/100ml)
c
c the units of the following parameters are as follow:
c if in card 250, the unit is mg/l or ug/l, then M is lbs
c if in card 250, the unit is #/100ml, then M is #, in this case the unit for
c soqc, ioqc and aoqc should be #/100ml instead of mg/l
c
c defid  dwqid  deluid  sqo     potfw     potfs   potfc   acqop   sqolim   wsqop    soqc   ioqc   aoqc   addc
awdc
       33      3      1000   0.000000       0.000000       0.000000       0.000000       0.001000
       0.500000       0.800000       0.000000       0.000000       0.000000       0.000000       0.000000
       33      3      2000   0.000000       0.000000       0.000000       0.000000       0.001000
       0.500000       0.800000       0.000000       0.000000       0.000000       0.000000       0.000000
```

```
33      3       3000    0.000000        0.000000        0.000000        0.000000        0.001000
0.500000        0.800000        0.000000        0.000000        0.000000        0.000000        0.000000
33      3       4000    0.000000        0.000000        0.000000        0.000000        0.060000
1.400000        0.600000        0.000000        0.000000        0.000000        0.000000        0.000000
33      3       5000    0.000000        0.000000        0.000000        0.000000        0.080000
1.400000        0.600000        0.000000        0.000000        0.000000        0.000000        0.000000
33      3       6000    0.000000        0.000000        0.000000        0.000000        0.200000
0.800000        0.800000        0.000000        0.000000        0.000000        0.000000        0.000000
33      3       7000    0.000000        0.000000        0.000000        0.000000        0.100000
0.800000        0.900000        0.000000        0.000000        0.000000        0.000000        0.000000
33      3       8000    0.000000        0.000000        0.000000        0.000000        0.020000
0.800000        0.600000        0.000000        0.000000        0.000000        0.000000        0.000000
33      3       9000    0.000000        0.000000        0.000000        0.000000        0.020000
0.800000        0.600000        0.000000        0.000000        0.000000        0.000000        0.000000
33      3       10000   0.000000        0.000000        0.000000        0.000000        0.000000
0.000001        1.640000        4.000000        0.000000        0.000000        0.000000        0.000000
33      3       11111   0.000000        0.000000        0.000000        0.000000        0.010000
0.800000        1.640000        0.000000        1.000000        0.300000        0.000000        0.000000
33      3       11112   0.000000        0.000000        0.000000        0.000000        0.010000
0.800000        1.640000        0.000000        1.000000        0.300000        0.000000        0.000000
33      3       11121   0.000000        0.000000        0.000000        0.000000        0.010000
0.800000        1.640000        0.000000        1.000000        0.300000        0.000000        0.000000
33      3       11122   0.000000        0.000000        0.000000        0.000000        0.010000
0.800000        1.640000        0.000000        1.000000        0.300000        0.000000        0.000000
33      3       11211   0.000000        0.000000        0.000000        0.000000        0.010000
0.800000        1.640000        0.000000        1.000000        0.300000        0.000000        0.000000
33      3       11212   0.000000        0.000000        0.000000        0.000000        0.010000
0.800000        1.640000        0.000000        1.000000        0.300000        0.000000        0.000000
33      3       11221   0.000000        0.000000        0.000000        0.000000        0.010000
0.800000        1.640000        0.000000        1.000000        0.300000        0.000000        0.000000
33      3       11222   0.000000        0.000000        0.000000        0.000000        0.010000
0.800000        1.640000        0.000000        1.000000        0.300000        0.000000        0.000000
33      3       11311   0.000000        0.000000        0.000000        0.000000        0.010000
0.800000        1.640000        0.000000        1.000000        0.300000        0.000000        0.000000
33      3       11312   0.000000        0.000000        0.000000        0.000000        0.010000
0.800000        1.640000        0.000000        1.000000        0.300000        0.000000        0.000000
33      3       11321   0.000000        0.000000        0.000000        0.000000        0.010000
0.800000        1.640000        0.000000        1.000000        0.300000        0.000000        0.000000
33      3       11322   0.000000        0.000000        0.000000        0.000000        0.010000
0.800000        1.640000        0.000000        1.000000        0.300000        0.000000        0.000000
33      3       11411   0.000000        0.000000        0.000000        0.000000        0.010000
0.800000        1.640000        0.000000        1.000000        0.300000        0.000000        0.000000
33      3       11412   0.000000        0.000000        0.000000        0.000000        0.010000
0.800000        1.640000        0.000000        1.000000        0.300000        0.000000        0.000000
33      3       11421   0.000000        0.000000        0.000000        0.000000        0.010000
0.800000        1.640000        0.000000        1.000000        0.300000        0.000000        0.000000
33      3       11422   0.000000        0.000000        0.000000        0.000000        0.010000
0.800000        1.640000        0.000000        1.000000        0.300000        0.000000        0.000000
33      3       12111   0.000000        0.000000        0.000000        0.000000        0.010000
0.800000        1.640000        0.000000        1.000000        0.300000        0.000000        0.000000
33      3       12112   0.000000        0.000000        0.000000        0.000000        0.010000
0.800000        1.640000        0.000000        1.000000        0.300000        0.000000        0.000000
33      3       12121   0.000000        0.000000        0.000000        0.000000        0.010000
0.800000        1.640000        0.000000        1.000000        0.300000        0.000000        0.000000
33      3       12122   0.000000        0.000000        0.000000        0.000000        0.010000
0.800000        1.640000        0.000000        1.000000        0.300000        0.000000        0.000000
33      3       12211   0.000000        0.000000        0.000000        0.000000        0.010000
0.800000        1.640000        0.000000        1.000000        0.300000        0.000000        0.000000
33      3       12212   0.000000        0.000000        0.000000        0.000000        0.010000
0.800000        1.640000        0.000000        1.000000        0.300000        0.000000        0.000000
33      3       12221   0.000000        0.000000        0.000000        0.000000        0.010000
0.800000        1.640000        0.000000        1.000000        0.300000        0.000000        0.000000
33      3       12222   0.000000        0.000000        0.000000        0.000000        0.010000
0.800000        1.640000        0.000000        1.000000        0.300000        0.000000        0.000000
33      3       12311   0.000000        0.000000        0.000000        0.000000        0.010000
0.800000        1.640000        0.000000        1.000000        0.300000        0.000000        0.000000
33      3       12312   0.000000        0.000000        0.000000        0.000000        0.010000
0.800000        1.640000        0.000000        1.000000        0.300000        0.000000        0.000000
33      3       12321   0.000000        0.000000        0.000000        0.000000        0.010000
0.800000        1.640000        0.000000        1.000000        0.300000        0.000000        0.000000
33      3       12322   0.000000        0.000000        0.000000        0.000000        0.010000
0.800000        1.640000        0.000000        1.000000        0.300000        0.000000        0.000000
33      3       12411   0.000000        0.000000        0.000000        0.000000        0.010000
0.800000        1.640000        0.000000        1.000000        0.300000        0.000000        0.000000
33      3       12412   0.000000        0.000000        0.000000        0.000000        0.010000
0.800000        1.640000        0.000000        1.000000        0.300000        0.000000        0.000000
33      3       12421   0.000000        0.000000        0.000000        0.000000        0.010000
0.800000        1.640000        0.000000        1.000000        0.300000        0.000000        0.000000
```

```
33     3       12422  0.000000       0.000000       0.000000       0.000000       0.010000
0.800000       1.640000       0.000000       1.000000       0.300000       0.000000       0.000000
33     3       13111  0.000000       0.000000       0.000000       0.000000       1.500000
8.000000       1.640000       0.000000       1.000000       0.300000       0.000000       0.000000
33     3       13112  0.000000       0.000000       0.000000       0.000000       1.500000
8.000000       1.640000       0.000000       1.000000       0.300000       0.000000       0.000000
33     3       13121  0.000000       0.000000       0.000000       0.000000       1.500000
8.000000       1.640000       0.000000       1.000000       0.300000       0.000000       0.000000
33     3       13122  0.000000       0.000000       0.000000       0.000000       1.500000
8.000000       1.640000       0.000000       1.000000       0.300000       0.000000       0.000000
33     3       13211  0.000000       0.000000       0.000000       0.000000       1.500000
8.000000       1.640000       0.000000       1.000000       0.300000       0.000000       0.000000
33     3       13212  0.000000       0.000000       0.000000       0.000000       1.500000
8.000000       1.640000       0.000000       1.000000       0.300000       0.000000       0.000000
33     3       13221  0.000000       0.000000       0.000000       0.000000       1.500000
8.000000       1.640000       0.000000       1.000000       0.300000       0.000000       0.000000
33     3       13222  0.000000       0.000000       0.000000       0.000000       1.500000
8.000000       1.640000       0.000000       1.000000       0.300000       0.000000       0.000000
33     3       13231  0.000000       0.000000       0.000000       0.000000       1.500000
8.000000       1.640000       0.000000       1.000000       0.300000       0.000000       0.000000
33     3       13232  0.000000       0.000000       0.000000       0.000000       1.500000
8.000000       1.640000       0.000000       1.000000       0.300000       0.000000       0.000000
33     3       13311  0.000000       0.000000       0.000000       0.000000       1.500000
8.000000       1.640000       0.000000       1.000000       0.300000       0.000000       0.000000
33     3       13312  0.000000       0.000000       0.000000       0.000000       1.500000
8.000000       1.640000       0.000000       1.000000       0.300000       0.000000       0.000000
33     3       13321  0.000000       0.000000       0.000000       0.000000       1.500000
8.000000       1.640000       0.000000       1.000000       0.300000       0.000000       0.000000
33     3       13322  0.000000       0.000000       0.000000       0.000000       1.500000
8.000000       1.640000       0.000000       1.000000       0.300000       0.000000       0.000000
33     3       13331  0.000000       0.000000       0.000000       0.000000       1.500000
8.000000       1.640000       0.000000       1.000000       0.300000       0.000000       0.000000
33     3       13411  0.000000       0.000000       0.000000       0.000000       1.500000
8.000000       1.640000       0.000000       1.000000       0.300000       0.000000       0.000000
33     3       13412  0.000000       0.000000       0.000000       0.000000       1.500000
8.000000       1.640000       0.000000       1.000000       0.300000       0.000000       0.000000
33     3       13421  0.000000       0.000000       0.000000       0.000000       1.500000
8.000000       1.640000       0.000000       1.000000       0.300000       0.000000       0.000000
33     3       13422  0.000000       0.000000       0.000000       0.000000       1.500000
8.000000       1.640000       0.000000       1.000000       0.300000       0.000000       0.000000
33     3       13431  0.000000       0.000000       0.000000       0.000000       1.500000
8.000000       1.640000       0.000000       1.000000       0.300000       0.000000       0.000000
33     3       13432  0.000000       0.000000       0.000000       0.000000       1.500000
8.000000       1.640000       0.000000       1.000000       0.300000       0.000000       0.000000
33     3       14121  0.000000       0.000000       0.000000       0.000000       0.050000
0.500000       1.640000       0.000000       1.000000       0.300000       0.000000       0.000000
33     3       14122  0.000000       0.000000       0.000000       0.000000       0.050000
0.500000       1.640000       0.000000       1.000000       0.300000       0.000000       0.000000
33     3       14131  0.000000       0.000000       0.000000       0.000000       0.050000
0.500000       1.640000       0.000000       1.000000       0.300000       0.000000       0.000000
33     3       14132  0.000000       0.000000       0.000000       0.000000       0.050000
0.500000       1.640000       0.000000       1.000000       0.300000       0.000000       0.000000
33     3       14221  0.000000       0.000000       0.000000       0.000000       0.050000
0.500000       1.640000       0.000000       1.000000       0.300000       0.000000       0.000000
33     3       14222  0.000000       0.000000       0.000000       0.000000       0.050000
0.500000       1.640000       0.000000       1.000000       0.300000       0.000000       0.000000
33     3       14231  0.000000       0.000000       0.000000       0.000000       0.050000
0.500000       1.640000       0.000000       1.000000       0.300000       0.000000       0.000000
33     3       14232  0.000000       0.000000       0.000000       0.000000       0.050000
0.500000       1.640000       0.000000       1.000000       0.300000       0.000000       0.000000
33     3       14321  0.000000       0.000000       0.000000       0.000000       0.050000
0.500000       1.640000       0.000000       1.000000       0.300000       0.000000       0.000000
33     3       14322  0.000000       0.000000       0.000000       0.000000       0.050000
0.500000       1.640000       0.000000       1.000000       0.300000       0.000000       0.000000
33     3       14331  0.000000       0.000000       0.000000       0.000000       0.050000
0.500000       1.640000       0.000000       1.000000       0.300000       0.000000       0.000000
33     3       14332  0.000000       0.000000       0.000000       0.000000       0.050000
0.500000       1.640000       0.000000       1.000000       0.300000       0.000000       0.000000
33     3       14421  0.000000       0.000000       0.000000       0.000000       0.050000
0.500000       1.640000       0.000000       1.000000       0.300000       0.000000       0.000000
33     3       14422  0.000000       0.000000       0.000000       0.000000       0.050000
0.500000       1.640000       0.000000       1.000000       0.300000       0.000000       0.000000
33     3       14431  0.000000       0.000000       0.000000       0.000000       0.050000
0.500000       1.640000       0.000000       1.000000       0.300000       0.000000       0.000000
33     3       14432  0.000000       0.000000       0.000000       0.000000       0.050000
0.500000       1.640000       0.000000       1.000000       0.300000       0.000000       0.000000
33     3       15121  0.000000       0.000000       0.000000       0.000000       0.050000
0.500000       1.640000       0.000000       1.000000       0.300000       0.000000       0.000000
```

```
33      3       15122  0.000000       0.000000       0.000000       0.000000       0.050000
0.500000        1.640000       0.000000       1.000000       0.300000       0.000000       0.000000
33      3       15131  0.000000       0.000000       0.000000       0.000000       0.050000
0.500000        1.640000       0.000000       1.000000       0.300000       0.000000       0.000000
33      3       15132  0.000000       0.000000       0.000000       0.000000       0.050000
0.500000        1.640000       0.000000       1.000000       0.300000       0.000000       0.000000
33      3       15221  0.000000       0.000000       0.000000       0.000000       0.050000
0.500000        1.640000       0.000000       1.000000       0.300000       0.000000       0.000000
33      3       15222  0.000000       0.000000       0.000000       0.000000       0.050000
0.500000        1.640000       0.000000       1.000000       0.300000       0.000000       0.000000
33      3       15231  0.000000       0.000000       0.000000       0.000000       0.050000
0.500000        1.640000       0.000000       1.000000       0.300000       0.000000       0.000000
33      3       15232  0.000000       0.000000       0.000000       0.000000       0.050000
0.500000        1.640000       0.000000       1.000000       0.300000       0.000000       0.000000
33      3       15321  0.000000       0.000000       0.000000       0.000000       0.050000
0.500000        1.640000       0.000000       1.000000       0.300000       0.000000       0.000000
33      3       15322  0.000000       0.000000       0.000000       0.000000       0.050000
0.500000        1.640000       0.000000       1.000000       0.300000       0.000000       0.000000
33      3       15331  0.000000       0.000000       0.000000       0.000000       0.050000
0.500000        1.640000       0.000000       1.000000       0.300000       0.000000       0.000000
33      3       15332  0.000000       0.000000       0.000000       0.000000       0.050000
0.500000        1.640000       0.000000       1.000000       0.300000       0.000000       0.000000
33      3       15421  0.000000       0.000000       0.000000       0.000000       0.050000
0.500000        1.640000       0.000000       1.000000       0.300000       0.000000       0.000000
33      3       15422  0.000000       0.000000       0.000000       0.000000       0.050000
0.500000        1.640000       0.000000       1.000000       0.300000       0.000000       0.000000
33      3       15431  0.000000       0.000000       0.000000       0.000000       0.050000
0.500000        1.640000       0.000000       1.000000       0.300000       0.000000       0.000000
33      3       15432  0.000000       0.000000       0.000000       0.000000       0.050000
0.500000        1.640000       0.000000       1.000000       0.300000       0.000000       0.000000
33      3       16000  0.000000       0.000000       0.000000       0.000000       0.000000
0.000001        1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33      7       1000   0.000000       4.462500       4.462500       0.000000       0.000000
0.000001        1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33      7       2000   0.000000       4.462500       4.462500       0.000000       0.000000
0.000001        1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33      7       3000   0.000000       4.462500       4.462500       0.000000       0.000000
0.000001        1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33      7       4000   0.000000       7.350000       7.350000       0.000000       0.000000
0.000001        1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33      7       5000   0.000000       6.825000       6.825000       0.000000       0.000000
0.000001        1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33      7       6000   0.000000       7.875000       7.875000       0.000000       0.000000
0.000001        1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33      7       7000   0.000000       7.350000       7.350000       0.000000       0.000000
0.000001        1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33      7       8000   0.000000       1.050000       1.050000       0.000000       0.000000
0.000001        1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33      7       9000   0.000000       1.050000       1.050000       0.000000       0.000000
0.000001        1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33      7       10000  0.000000       0.000000       0.000000       0.000000       0.000000
0.000001        1.640000       0.400000       0.000000       0.000000       0.000000       0.000000
33      7       11111  0.000000       2.000000       2.000000       0.000000       0.000000
0.000001        1.640000       0.000000       0.400000       0.200000       0.000000       0.000000
33      7       11112  0.000000       2.000000       2.000000       0.000000       0.000000
0.000001        1.640000       0.000000       0.400000       0.200000       0.000000       0.000000
33      7       11121  0.000000       2.000000       2.000000       0.000000       0.000000
0.000001        1.640000       0.000000       0.400000       0.200000       0.000000       0.000000
33      7       11122  0.000000       2.000000       2.000000       0.000000       0.000000
0.000001        1.640000       0.000000       0.400000       0.200000       0.000000       0.000000
33      7       11211  0.000000       2.000000       2.000000       0.000000       0.000000
0.000001        1.640000       0.000000       0.400000       0.200000       0.000000       0.000000
33      7       11212  0.000000       2.000000       2.000000       0.000000       0.000000
0.000001        1.640000       0.000000       0.400000       0.200000       0.000000       0.000000
33      7       11221  0.000000       2.000000       2.000000       0.000000       0.000000
0.000001        1.640000       0.000000       0.400000       0.200000       0.000000       0.000000
33      7       11222  0.000000       2.000000       2.000000       0.000000       0.000000
0.000001        1.640000       0.000000       0.400000       0.200000       0.000000       0.000000
33      7       11311  0.000000       2.000000       2.000000       0.000000       0.000000
0.000001        1.640000       0.000000       0.400000       0.200000       0.000000       0.000000
33      7       11312  0.000000       2.000000       2.000000       0.000000       0.000000
0.000001        1.640000       0.000000       0.400000       0.200000       0.000000       0.000000
33      7       11321  0.000000       2.000000       2.000000       0.000000       0.000000
0.000001        1.640000       0.000000       0.400000       0.200000       0.000000       0.000000
33      7       11322  0.000000       2.000000       2.000000       0.000000       0.000000
0.000001        1.640000       0.000000       0.400000       0.200000       0.000000       0.000000
33      7       11411  0.000000       2.000000       2.000000       0.000000       0.000000
0.000001        1.640000       0.000000       0.400000       0.200000       0.000000       0.000000
```

```
33     7       11412  0.000000       2.000000       2.000000       0.000000       0.000000
0.000001       1.640000       0.000000       0.400000       0.200000       0.000000       0.000000
33     7       11421  0.000000       2.000000       2.000000       0.000000       0.000000
0.000001       1.640000       0.000000       0.400000       0.200000       0.000000       0.000000
33     7       11422  0.000000       2.000000       2.000000       0.000000       0.000000
0.000001       1.640000       0.000000       0.400000       0.200000       0.000000       0.000000
33     7       12111  0.000000       2.000000       2.000000       0.000000       0.000000
0.000001       1.640000       0.000000       0.400000       0.200000       0.000000       0.000000
33     7       12112  0.000000       2.000000       2.000000       0.000000       0.000000
0.000001       1.640000       0.000000       0.400000       0.200000       0.000000       0.000000
33     7       12121  0.000000       2.000000       2.000000       0.000000       0.000000
0.000001       1.640000       0.000000       0.400000       0.200000       0.000000       0.000000
33     7       12122  0.000000       2.000000       2.000000       0.000000       0.000000
0.000001       1.640000       0.000000       0.400000       0.200000       0.000000       0.000000
33     7       12211  0.000000       2.000000       2.000000       0.000000       0.000000
0.000001       1.640000       0.000000       0.400000       0.200000       0.000000       0.000000
33     7       12212  0.000000       2.000000       2.000000       0.000000       0.000000
0.000001       1.640000       0.000000       0.400000       0.200000       0.000000       0.000000
33     7       12221  0.000000       2.000000       2.000000       0.000000       0.000000
0.000001       1.640000       0.000000       0.400000       0.200000       0.000000       0.000000
33     7       12222  0.000000       2.000000       2.000000       0.000000       0.000000
0.000001       1.640000       0.000000       0.400000       0.200000       0.000000       0.000000
33     7       12311  0.000000       2.000000       2.000000       0.000000       0.000000
0.000001       1.640000       0.000000       0.400000       0.200000       0.000000       0.000000
33     7       12312  0.000000       2.000000       2.000000       0.000000       0.000000
0.000001       1.640000       0.000000       0.400000       0.200000       0.000000       0.000000
33     7       12321  0.000000       2.000000       2.000000       0.000000       0.000000
0.000001       1.640000       0.000000       0.400000       0.200000       0.000000       0.000000
33     7       12322  0.000000       2.000000       2.000000       0.000000       0.000000
0.000001       1.640000       0.000000       0.400000       0.200000       0.000000       0.000000
33     7       12411  0.000000       2.000000       2.000000       0.000000       0.000000
0.000001       1.640000       0.000000       0.400000       0.200000       0.000000       0.000000
33     7       12412  0.000000       2.000000       2.000000       0.000000       0.000000
0.000001       1.640000       0.000000       0.400000       0.200000       0.000000       0.000000
33     7       12421  0.000000       2.000000       2.000000       0.000000       0.000000
0.000001       1.640000       0.000000       0.400000       0.200000       0.000000       0.000000
33     7       12422  0.000000       2.000000       2.000000       0.000000       0.000000
0.000001       1.640000       0.000000       0.400000       0.200000       0.000000       0.000000
33     7       13111  0.000000       8.000000       8.000000       0.000000       0.000000
0.000001       1.640000       0.000000       1.200000       0.600000       0.000000       0.000000
33     7       13112  0.000000       8.000000       8.000000       0.000000       0.000000
0.000001       1.640000       0.000000       1.200000       0.600000       0.000000       0.000000
33     7       13121  0.000000       8.000000       8.000000       0.000000       0.000000
0.000001       1.640000       0.000000       1.200000       0.600000       0.000000       0.000000
33     7       13122  0.000000       8.000000       8.000000       0.000000       0.000000
0.000001       1.640000       0.000000       1.200000       0.600000       0.000000       0.000000
33     7       13211  0.000000       8.000000       8.000000       0.000000       0.000000
0.000001       1.640000       0.000000       1.200000       0.600000       0.000000       0.000000
33     7       13212  0.000000       8.000000       8.000000       0.000000       0.000000
0.000001       1.640000       0.000000       1.200000       0.600000       0.000000       0.000000
33     7       13221  0.000000       8.000000       8.000000       0.000000       0.000000
0.000001       1.640000       0.000000       1.200000       0.600000       0.000000       0.000000
33     7       13222  0.000000       8.000000       8.000000       0.000000       0.000000
0.000001       1.640000       0.000000       1.200000       0.600000       0.000000       0.000000
33     7       13231  0.000000       8.000000       8.000000       0.000000       0.000000
0.000001       1.640000       0.000000       1.200000       0.600000       0.000000       0.000000
33     7       13232  0.000000       8.000000       8.000000       0.000000       0.000000
0.000001       1.640000       0.000000       1.200000       0.600000       0.000000       0.000000
33     7       13311  0.000000       8.000000       8.000000       0.000000       0.000000
0.000001       1.640000       0.000000       1.200000       0.600000       0.000000       0.000000
33     7       13312  0.000000       8.000000       8.000000       0.000000       0.000000
0.000001       1.640000       0.000000       1.200000       0.600000       0.000000       0.000000
33     7       13321  0.000000       8.000000       8.000000       0.000000       0.000000
0.000001       1.640000       0.000000       1.200000       0.600000       0.000000       0.000000
33     7       13322  0.000000       8.000000       8.000000       0.000000       0.000000
0.000001       1.640000       0.000000       1.200000       0.600000       0.000000       0.000000
33     7       13331  0.000000       8.000000       8.000000       0.000000       0.000000
0.000001       1.640000       0.000000       1.200000       0.600000       0.000000       0.000000
33     7       13411  0.000000       8.000000       8.000000       0.000000       0.000000
0.000001       1.640000       0.000000       1.200000       0.600000       0.000000       0.000000
33     7       13412  0.000000       8.000000       8.000000       0.000000       0.000000
0.000001       1.640000       0.000000       1.200000       0.600000       0.000000       0.000000
33     7       13421  0.000000       8.000000       8.000000       0.000000       0.000000
0.000001       1.640000       0.000000       1.200000       0.600000       0.000000       0.000000
33     7       13422  0.000000       8.000000       8.000000       0.000000       0.000000
0.000001       1.640000       0.000000       1.200000       0.600000       0.000000       0.000000
33     7       13431  0.000000       8.000000       8.000000       0.000000       0.000000
0.000001       1.640000       0.000000       1.200000       0.600000       0.000000       0.000000
```

```
33      7       13432   0.000000        8.000000        8.000000        0.000000        0.000000
0.000001        1.640000        0.000000        1.200000        0.600000        0.000000        0.000000
33      7       14121   0.000000        2.000000        2.000000        0.000000        0.000000
0.000001        1.640000        0.000000        0.200000        0.200000        0.000000        0.000000
33      7       14122   0.000000        2.000000        2.000000        0.000000        0.000000
0.000001        1.640000        0.000000        0.200000        0.200000        0.000000        0.000000
33      7       14131   0.000000        2.000000        2.000000        0.000000        0.000000
0.000001        1.640000        0.000000        0.200000        0.200000        0.000000        0.000000
33      7       14132   0.000000        2.000000        2.000000        0.000000        0.000000
0.000001        1.640000        0.000000        0.200000        0.200000        0.000000        0.000000
33      7       14221   0.000000        2.000000        2.000000        0.000000        0.000000
0.000001        1.640000        0.000000        0.200000        0.200000        0.000000        0.000000
33      7       14222   0.000000        2.000000        2.000000        0.000000        0.000000
0.000001        1.640000        0.000000        0.200000        0.200000        0.000000        0.000000
33      7       14231   0.000000        2.000000        2.000000        0.000000        0.000000
0.000001        1.640000        0.000000        0.200000        0.200000        0.000000        0.000000
33      7       14232   0.000000        2.000000        2.000000        0.000000        0.000000
0.000001        1.640000        0.000000        0.200000        0.200000        0.000000        0.000000
33      7       14321   0.000000        2.000000        2.000000        0.000000        0.000000
0.000001        1.640000        0.000000        0.200000        0.200000        0.000000        0.000000
33      7       14322   0.000000        2.000000        2.000000        0.000000        0.000000
0.000001        1.640000        0.000000        0.200000        0.200000        0.000000        0.000000
33      7       14331   0.000000        2.000000        2.000000        0.000000        0.000000
0.000001        1.640000        0.000000        0.200000        0.200000        0.000000        0.000000
33      7       14332   0.000000        2.000000        2.000000        0.000000        0.000000
0.000001        1.640000        0.000000        0.200000        0.200000        0.000000        0.000000
33      7       14421   0.000000        2.000000        2.000000        0.000000        0.000000
0.000001        1.640000        0.000000        0.200000        0.200000        0.000000        0.000000
33      7       14422   0.000000        2.000000        2.000000        0.000000        0.000000
0.000001        1.640000        0.000000        0.200000        0.200000        0.000000        0.000000
33      7       14431   0.000000        2.000000        2.000000        0.000000        0.000000
0.000001        1.640000        0.000000        0.200000        0.200000        0.000000        0.000000
33      7       14432   0.000000        2.000000        2.000000        0.000000        0.000000
0.000001        1.640000        0.000000        0.200000        0.200000        0.000000        0.000000
33      7       15121   0.000000        2.000000        2.000000        0.000000        0.000000
0.000001        1.640000        0.000000        0.200000        0.200000        0.000000        0.000000
33      7       15122   0.000000        2.000000        2.000000        0.000000        0.000000
0.000001        1.640000        0.000000        0.200000        0.200000        0.000000        0.000000
33      7       15131   0.000000        2.000000        2.000000        0.000000        0.000000
0.000001        1.640000        0.000000        0.200000        0.200000        0.000000        0.000000
33      7       15132   0.000000        2.000000        2.000000        0.000000        0.000000
0.000001        1.640000        0.000000        0.200000        0.200000        0.000000        0.000000
33      7       15221   0.000000        2.000000        2.000000        0.000000        0.000000
0.000001        1.640000        0.000000        0.200000        0.200000        0.000000        0.000000
33      7       15222   0.000000        2.000000        2.000000        0.000000        0.000000
0.000001        1.640000        0.000000        0.200000        0.200000        0.000000        0.000000
33      7       15231   0.000000        2.000000        2.000000        0.000000        0.000000
0.000001        1.640000        0.000000        0.200000        0.200000        0.000000        0.000000
33      7       15232   0.000000        2.000000        2.000000        0.000000        0.000000
0.000001        1.640000        0.000000        0.200000        0.200000        0.000000        0.000000
33      7       15321   0.000000        2.000000        2.000000        0.000000        0.000000
0.000001        1.640000        0.000000        0.200000        0.200000        0.000000        0.000000
33      7       15322   0.000000        2.000000        2.000000        0.000000        0.000000
0.000001        1.640000        0.000000        0.200000        0.200000        0.000000        0.000000
33      7       15331   0.000000        2.000000        2.000000        0.000000        0.000000
0.000001        1.640000        0.000000        0.200000        0.200000        0.000000        0.000000
33      7       15332   0.000000        2.000000        2.000000        0.000000        0.000000
0.000001        1.640000        0.000000        0.200000        0.200000        0.000000        0.000000
33      7       15421   0.000000        2.000000        2.000000        0.000000        0.000000
0.000001        1.640000        0.000000        0.200000        0.200000        0.000000        0.000000
33      7       15422   0.000000        2.000000        2.000000        0.000000        0.000000
0.000001        1.640000        0.000000        0.200000        0.200000        0.000000        0.000000
33      7       15431   0.000000        2.000000        2.000000        0.000000        0.000000
0.000001        1.640000        0.000000        0.200000        0.200000        0.000000        0.000000
33      7       15432   0.000000        2.000000        2.000000        0.000000        0.000000
0.000001        1.640000        0.000000        0.200000        0.200000        0.000000        0.000000
33      7       16000   0.000000        0.000000        0.000000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
33      10      1000    0.000000        0.017500        0.017500        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
33      10      2000    0.000000        0.015000        0.015000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
33      10      3000    0.000000        0.012000        0.012000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
33      10      4000    0.000000        0.015000        0.015000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
33      10      5000    0.000000        0.007500        0.007500        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
```

```
33      10      6000    0.000000        0.020000        0.020000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
33      10      7000    0.000000        0.025000        0.025000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
33      10      8000    0.000000        0.011250        0.011250        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
33      10      9000    0.000000        0.003750        0.003750        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
33      10      10000   0.000000        0.000000        0.000000        0.000000        0.000000
0.000001        1.640000        0.100000        0.000000        0.000000        0.000000        0.000000
33      10      11111   0.000000        0.005000        0.005000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
33      10      11112   0.000000        0.005000        0.005000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
33      10      11121   0.000000        0.005000        0.005000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
33      10      11122   0.000000        0.005000        0.005000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
33      10      11211   0.000000        0.005000        0.005000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
33      10      11212   0.000000        0.005000        0.005000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
33      10      11221   0.000000        0.005000        0.005000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
33      10      11222   0.000000        0.005000        0.005000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
33      10      11311   0.000000        0.005000        0.005000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
33      10      11312   0.000000        0.005000        0.005000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
33      10      11321   0.000000        0.005000        0.005000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
33      10      11322   0.000000        0.005000        0.005000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
33      10      11411   0.000000        0.005000        0.005000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
33      10      11412   0.000000        0.005000        0.005000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
33      10      11421   0.000000        0.005000        0.005000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
33      10      11422   0.000000        0.005000        0.005000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
33      10      12111   0.000000        0.005000        0.005000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
33      10      12112   0.000000        0.005000        0.005000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
33      10      12121   0.000000        0.005000        0.005000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
33      10      12122   0.000000        0.005000        0.005000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
33      10      12211   0.000000        0.005000        0.005000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
33      10      12212   0.000000        0.005000        0.005000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
33      10      12221   0.000000        0.005000        0.005000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
33      10      12222   0.000000        0.005000        0.005000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
33      10      12311   0.000000        0.005000        0.005000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
33      10      12312   0.000000        0.005000        0.005000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
33      10      12321   0.000000        0.005000        0.005000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
33      10      12322   0.000000        0.005000        0.005000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
33      10      12411   0.000000        0.005000        0.005000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
33      10      12412   0.000000        0.005000        0.005000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
33      10      12421   0.000000        0.005000        0.005000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
33      10      12422   0.000000        0.005000        0.005000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
33      10      13111   0.000000        0.001000        0.001000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
33      10      13112   0.000000        0.001000        0.001000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
```

```
33     10      13121   0.000000       0.001000       0.001000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33     10      13122   0.000000       0.001000       0.001000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33     10      13211   0.000000       0.001000       0.001000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33     10      13212   0.000000       0.001000       0.001000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33     10      13221   0.000000       0.001000       0.001000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33     10      13222   0.000000       0.001000       0.001000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33     10      13231   0.000000       0.001000       0.001000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33     10      13232   0.000000       0.001000       0.001000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33     10      13311   0.000000       0.001000       0.001000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33     10      13312   0.000000       0.001000       0.001000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33     10      13321   0.000000       0.001000       0.001000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33     10      13322   0.000000       0.001000       0.001000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33     10      13331   0.000000       0.001000       0.001000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33     10      13411   0.000000       0.001000       0.001000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33     10      13412   0.000000       0.001000       0.001000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33     10      13421   0.000000       0.001000       0.001000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33     10      13422   0.000000       0.001000       0.001000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33     10      13431   0.000000       0.001000       0.001000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33     10      13432   0.000000       0.001000       0.001000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33     10      14121   0.000000       0.001000       0.001000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33     10      14122   0.000000       0.001000       0.001000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33     10      14131   0.000000       0.001000       0.001000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33     10      14132   0.000000       0.001000       0.001000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33     10      14221   0.000000       0.001000       0.001000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33     10      14222   0.000000       0.001000       0.001000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33     10      14231   0.000000       0.001000       0.001000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33     10      14232   0.000000       0.001000       0.001000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33     10      14321   0.000000       0.001000       0.001000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33     10      14322   0.000000       0.001000       0.001000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33     10      14331   0.000000       0.001000       0.001000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33     10      14332   0.000000       0.001000       0.001000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33     10      14421   0.000000       0.001000       0.001000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33     10      14422   0.000000       0.001000       0.001000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33     10      14431   0.000000       0.001000       0.001000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33     10      14432   0.000000       0.001000       0.001000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33     10      15121   0.000000       0.001000       0.001000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33     10      15122   0.000000       0.001000       0.001000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33     10      15131   0.000000       0.001000       0.001000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33     10      15132   0.000000       0.001000       0.001000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
```

```
33      10     15221   0.000000       0.001000       0.001000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33      10     15222   0.000000       0.001000       0.001000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33      10     15231   0.000000       0.001000       0.001000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33      10     15232   0.000000       0.001000       0.001000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33      10     15321   0.000000       0.001000       0.001000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33      10     15322   0.000000       0.001000       0.001000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33      10     15331   0.000000       0.001000       0.001000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33      10     15332   0.000000       0.001000       0.001000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33      10     15421   0.000000       0.001000       0.001000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33      10     15422   0.000000       0.001000       0.001000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33      10     15431   0.000000       0.001000       0.001000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33      10     15432   0.000000       0.001000       0.001000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33      10     16000   0.000000       0.000000       0.000000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33      11     1000    0.000000       1.750000       1.750000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33      11     2000    0.000000       1.500000       1.500000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33      11     3000    0.000000       1.200000       1.200000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33      11     4000    0.000000       1.500000       1.500000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33      11     5000    0.000000       0.750000       0.750000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33      11     6000    0.000000       2.000000       2.000000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33      11     7000    0.000000       2.500000       2.500000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33      11     8000    0.000000       1.125000       1.125000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33      11     9000    0.000000       0.375000       0.375000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33      11     10000   0.000000       0.000000       0.000000       0.000000       0.000000
0.000001       1.640000       25.000000      0.000000       0.000000       0.000000       0.000000
33      11     11111   0.000000       0.500000       0.500000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33      11     11112   0.000000       0.500000       0.500000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33      11     11121   0.000000       0.500000       0.500000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33      11     11122   0.000000       0.500000       0.500000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33      11     11211   0.000000       0.500000       0.500000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33      11     11212   0.000000       0.500000       0.500000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33      11     11221   0.000000       0.500000       0.500000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33      11     11222   0.000000       0.500000       0.500000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33      11     11311   0.000000       0.500000       0.500000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33      11     11312   0.000000       0.500000       0.500000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33      11     11321   0.000000       0.500000       0.500000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33      11     11322   0.000000       0.500000       0.500000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33      11     11411   0.000000       0.500000       0.500000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33      11     11412   0.000000       0.500000       0.500000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33      11     11421   0.000000       0.500000       0.500000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33      11     11422   0.000000       0.500000       0.500000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
```

```
33      11     12111   0.000000       0.500000       0.030000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33      11     12112   0.000000       0.500000       0.030000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33      11     12121   0.000000       0.500000       0.030000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33      11     12122   0.000000       0.500000       0.030000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33      11     12211   0.000000       0.500000       0.030000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33      11     12212   0.000000       0.500000       0.030000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33      11     12221   0.000000       0.500000       0.030000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33      11     12222   0.000000       0.500000       0.030000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33      11     12311   0.000000       0.500000       0.030000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33      11     12312   0.000000       0.500000       0.030000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33      11     12321   0.000000       0.500000       0.030000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33      11     12322   0.000000       0.500000       0.030000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33      11     12411   0.000000       0.500000       0.030000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33      11     12412   0.000000       0.500000       0.030000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33      11     12421   0.000000       0.500000       0.030000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33      11     12422   0.000000       0.500000       0.030000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33      11     13111   0.000000       0.100000       0.100000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33      11     13112   0.000000       0.100000       0.100000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33      11     13121   0.000000       0.100000       0.100000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33      11     13122   0.000000       0.100000       0.100000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33      11     13211   0.000000       0.100000       0.100000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33      11     13212   0.000000       0.100000       0.100000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33      11     13221   0.000000       0.100000       0.100000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33      11     13222   0.000000       0.100000       0.100000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33      11     13231   0.000000       0.100000       0.100000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33      11     13232   0.000000       0.100000       0.100000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33      11     13311   0.000000       0.100000       0.100000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33      11     13312   0.000000       0.100000       0.100000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33      11     13321   0.000000       0.100000       0.100000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33      11     13322   0.000000       0.100000       0.100000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33      11     13331   0.000000       0.100000       0.100000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33      11     13411   0.000000       0.100000       0.100000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33      11     13412   0.000000       0.100000       0.100000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33      11     13421   0.000000       0.100000       0.100000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33      11     13422   0.000000       0.100000       0.100000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33      11     13431   0.000000       0.100000       0.100000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33      11     13432   0.000000       0.100000       0.100000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33      11     14121   0.000000       0.100000       0.100000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33      11     14122   0.000000       0.100000       0.100000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
```

```
33      11      14131   0.000000        0.100000        0.100000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
33      11      14132   0.000000        0.100000        0.100000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
33      11      14221   0.000000        0.100000        0.100000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
33      11      14222   0.000000        0.100000        0.100000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
33      11      14231   0.000000        0.100000        0.100000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
33      11      14232   0.000000        0.100000        0.100000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
33      11      14321   0.000000        0.100000        0.100000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
33      11      14322   0.000000        0.100000        0.100000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
33      11      14331   0.000000        0.100000        0.100000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
33      11      14332   0.000000        0.100000        0.100000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
33      11      14421   0.000000        0.100000        0.100000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
33      11      14422   0.000000        0.100000        0.100000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
33      11      14431   0.000000        0.100000        0.100000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
33      11      14432   0.000000        0.100000        0.100000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
33      11      15121   0.000000        0.100000        0.100000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
33      11      15122   0.000000        0.100000        0.100000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
33      11      15131   0.000000        0.100000        0.100000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
33      11      15132   0.000000        0.100000        0.100000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
33      11      15221   0.000000        0.100000        0.100000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
33      11      15222   0.000000        0.100000        0.100000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
33      11      15231   0.000000        0.100000        0.100000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
33      11      15232   0.000000        0.100000        0.100000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
33      11      15321   0.000000        0.100000        0.100000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
33      11      15322   0.000000        0.100000        0.100000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
33      11      15331   0.000000        0.100000        0.100000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
33      11      15332   0.000000        0.100000        0.100000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
33      11      15421   0.000000        0.100000        0.100000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
33      11      15422   0.000000        0.100000        0.100000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
33      11      15431   0.000000        0.100000        0.100000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
33      11      15432   0.000000        0.100000        0.100000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
33      11      16000   0.000000        0.000000        0.000000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
33      12      1000    0.000000        0.432000        0.432000        0.000000        0.000000
0.000001        1.640000        50.000000       0.000000        0.000000        0.000000        0.000000
33      12      2000    0.000000        0.324000        0.324000        0.000000        0.000000
0.000001        1.640000        50.000000       0.000000        0.000000        0.000000        0.000000
33      12      3000    0.000000        0.108000        0.108000        0.000000        0.000000
0.000001        1.640000        50.000000       0.000000        0.000000        0.000000        0.000000
33      12      4000    0.000000        0.432000        0.432000        0.000000        0.000000
0.000001        1.640000        50.000000       0.000000        0.000000        0.000000        0.000000
33      12      5000    0.000000        0.378000        0.378000        0.000000        0.000000
0.000001        1.640000        50.000000       0.000000        0.000000        0.000000        0.000000
33      12      6000    0.000000        0.518400        0.518400        0.000000        0.000000
0.000001        1.640000        50.000000       0.000000        0.000000        0.000000        0.000000
33      12      7000    0.000000        0.691200        0.691200        0.000000        0.000000
0.000001        1.640000        50.000000       0.000000        0.000000        0.000000        0.000000
33      12      8000    0.000000        0.270000        0.270000        0.000000        0.000000
0.000001        1.640000        50.000000       0.000000        0.000000        0.000000        0.000000
```

```
33      12      9000   0.000000       0.090000       0.090000       0.000000       0.000000
0.000001        1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33      12      10000  0.000000       0.000000       0.000000       0.000000       0.000000
0.000001        1.640000       4.000000       0.000000       0.000000       0.000000       0.000000
33      12      11111  0.000000       0.010000       0.010000       0.000000       0.000000
0.000001        1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33      12      11112  0.000000       0.010000       0.010000       0.000000       0.000000
0.000001        1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33      12      11121  0.000000       0.010000       0.010000       0.000000       0.000000
0.000001        1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33      12      11122  0.000000       0.010000       0.010000       0.000000       0.000000
0.000001        1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33      12      11211  0.000000       0.010000       0.010000       0.000000       0.000000
0.000001        1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33      12      11212  0.000000       0.010000       0.010000       0.000000       0.000000
0.000001        1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33      12      11221  0.000000       0.010000       0.010000       0.000000       0.000000
0.000001        1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33      12      11222  0.000000       0.010000       0.010000       0.000000       0.000000
0.000001        1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33      12      11311  0.000000       0.010000       0.010000       0.000000       0.000000
0.000001        1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33      12      11312  0.000000       0.010000       0.010000       0.000000       0.000000
0.000001        1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33      12      11321  0.000000       0.010000       0.010000       0.000000       0.000000
0.000001        1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33      12      11322  0.000000       0.010000       0.010000       0.000000       0.000000
0.000001        1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33      12      11411  0.000000       0.010000       0.010000       0.000000       0.000000
0.000001        1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33      12      11412  0.000000       0.010000       0.010000       0.000000       0.000000
0.000001        1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33      12      11421  0.000000       0.010000       0.010000       0.000000       0.000000
0.000001        1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33      12      11422  0.000000       0.010000       0.010000       0.000000       0.000000
0.000001        1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33      12      12111  0.000000       0.010000       0.010000       0.000000       0.000000
0.000001        1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33      12      12112  0.000000       0.010000       0.010000       0.000000       0.000000
0.000001        1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33      12      12121  0.000000       0.010000       0.010000       0.000000       0.000000
0.000001        1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33      12      12122  0.000000       0.010000       0.010000       0.000000       0.000000
0.000001        1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33      12      12211  0.000000       0.010000       0.010000       0.000000       0.000000
0.000001        1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33      12      12212  0.000000       0.010000       0.010000       0.000000       0.000000
0.000001        1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33      12      12221  0.000000       0.010000       0.010000       0.000000       0.000000
0.000001        1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33      12      12222  0.000000       0.010000       0.010000       0.000000       0.000000
0.000001        1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33      12      12311  0.000000       0.010000       0.010000       0.000000       0.000000
0.000001        1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33      12      12312  0.000000       0.010000       0.010000       0.000000       0.000000
0.000001        1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33      12      12321  0.000000       0.010000       0.010000       0.000000       0.000000
0.000001        1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33      12      12322  0.000000       0.010000       0.010000       0.000000       0.000000
0.000001        1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33      12      12411  0.000000       0.010000       0.010000       0.000000       0.000000
0.000001        1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33      12      12412  0.000000       0.010000       0.010000       0.000000       0.000000
0.000001        1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33      12      12421  0.000000       0.010000       0.010000       0.000000       0.000000
0.000001        1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33      12      12422  0.000000       0.010000       0.010000       0.000000       0.000000
0.000001        1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33      12      13111  0.000000       0.010000       0.010000       0.000000       0.000000
0.000001        1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33      12      13112  0.000000       0.010000       0.010000       0.000000       0.000000
0.000001        1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33      12      13121  0.000000       0.010000       0.010000       0.000000       0.000000
0.000001        1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33      12      13122  0.000000       0.010000       0.010000       0.000000       0.000000
0.000001        1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33      12      13211  0.000000       0.010000       0.010000       0.000000       0.000000
0.000001        1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
```

```
33      12     13212  0.000000       0.010000       0.010000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33      12     13221  0.000000       0.010000       0.010000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33      12     13222  0.000000       0.010000       0.010000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33      12     13231  0.000000       0.010000       0.010000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33      12     13232  0.000000       0.010000       0.010000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33      12     13311  0.000000       0.010000       0.010000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33      12     13312  0.000000       0.010000       0.010000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33      12     13321  0.000000       0.010000       0.010000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33      12     13322  0.000000       0.010000       0.010000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33      12     13331  0.000000       0.010000       0.010000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33      12     13411  0.000000       0.010000       0.010000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33      12     13412  0.000000       0.010000       0.010000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33      12     13421  0.000000       0.010000       0.010000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33      12     13422  0.000000       0.010000       0.010000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33      12     13431  0.000000       0.010000       0.010000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33      12     13432  0.000000       0.010000       0.010000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33      12     14121  0.000000       0.010000       0.010000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33      12     14122  0.000000       0.010000       0.010000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33      12     14131  0.000000       0.010000       0.010000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33      12     14132  0.000000       0.010000       0.010000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33      12     14221  0.000000       0.010000       0.010000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33      12     14222  0.000000       0.010000       0.010000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33      12     14231  0.000000       0.010000       0.010000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33      12     14232  0.000000       0.010000       0.010000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33      12     14321  0.000000       0.010000       0.010000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33      12     14322  0.000000       0.010000       0.010000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33      12     14331  0.000000       0.010000       0.010000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33      12     14332  0.000000       0.010000       0.010000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33      12     14421  0.000000       0.010000       0.010000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33      12     14422  0.000000       0.010000       0.010000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33      12     14431  0.000000       0.010000       0.010000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33      12     14432  0.000000       0.010000       0.010000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33      12     15121  0.000000       0.010000       0.010000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33      12     15122  0.000000       0.010000       0.010000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33      12     15131  0.000000       0.010000       0.010000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33      12     15132  0.000000       0.010000       0.010000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33      12     15221  0.000000       0.010000       0.010000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33      12     15222  0.000000       0.010000       0.010000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33      12     15231  0.000000       0.010000       0.010000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
```

```
33      12     15232  0.000000       0.010000       0.010000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33      12     15321  0.000000       0.010000       0.010000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33      12     15322  0.000000       0.010000       0.010000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33      12     15331  0.000000       0.010000       0.010000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33      12     15332  0.000000       0.010000       0.010000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33      12     15421  0.000000       0.010000       0.010000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33      12     15422  0.000000       0.010000       0.010000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33      12     15431  0.000000       0.010000       0.010000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33      12     15432  0.000000       0.010000       0.010000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33      12     16000  0.000000       0.000000       0.000000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33      14     1000   0.000000       13.824000      13.824000      0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33      14     2000   0.000000       6.912000       6.912000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33      14     3000   0.000000       5.184000       5.184000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33      14     4000   0.000000       4.500000       4.500000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33      14     5000   0.000000       2.700000       2.700000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33      14     6000   0.000000       5.760000       5.760000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33      14     7000   0.000000       11.520000      11.520000      0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33      14     8000   0.000000       4.320000       4.320000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33      14     9000   0.000000       5.400000       5.400000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33      14     10000  0.000000       0.000000       0.000000       0.000000       0.000000
0.000001       1.640000       80.000000      0.000000       0.000000       0.000000       0.000000
33      14     11111  0.000000       3.600000       3.600000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       50.000000      0.000000       0.000000
33      14     11112  0.000000       3.600000       3.600000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       50.000000      0.000000       0.000000
33      14     11121  0.000000       3.600000       3.600000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       50.000000      0.000000       0.000000
33      14     11122  0.000000       3.600000       3.600000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       50.000000      0.000000       0.000000
33      14     11211  0.000000       3.600000       3.600000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       50.000000      0.000000       0.000000
33      14     11212  0.000000       3.600000       3.600000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       50.000000      0.000000       0.000000
33      14     11221  0.000000       3.600000       3.600000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       50.000000      0.000000       0.000000
33      14     11222  0.000000       3.600000       3.600000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       50.000000      0.000000       0.000000
33      14     11311  0.000000       3.600000       3.600000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       50.000000      0.000000       0.000000
33      14     11312  0.000000       3.600000       3.600000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       50.000000      0.000000       0.000000
33      14     11321  0.000000       3.600000       3.600000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       50.000000      0.000000       0.000000
33      14     11322  0.000000       3.600000       3.600000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       50.000000      0.000000       0.000000
33      14     11411  0.000000       3.600000       3.600000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       50.000000      0.000000       0.000000
33      14     11412  0.000000       3.600000       3.600000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       50.000000      0.000000       0.000000
33      14     11421  0.000000       3.600000       3.600000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       50.000000      0.000000       0.000000
33      14     11422  0.000000       3.600000       3.600000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       50.000000      0.000000       0.000000
33      14     12111  0.000000       3.600000       3.600000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       50.000000      0.000000       0.000000
33      14     12112  0.000000       3.600000       3.600000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       50.000000      0.000000       0.000000
33      14     12121  0.000000       3.600000       3.600000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       50.000000      0.000000       0.000000
```

```
33      14      12122   0.000000        3.600000        3.600000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        50.000000       0.000000        0.000000
33      14      12211   0.000000        3.600000        3.600000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        50.000000       0.000000        0.000000
33      14      12212   0.000000        3.600000        3.600000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        50.000000       0.000000        0.000000
33      14      12221   0.000000        3.600000        3.600000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        50.000000       0.000000        0.000000
33      14      12222   0.000000        3.600000        3.600000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        50.000000       0.000000        0.000000
33      14      12311   0.000000        3.600000        3.600000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        50.000000       0.000000        0.000000
33      14      12312   0.000000        3.600000        3.600000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        50.000000       0.000000        0.000000
33      14      12321   0.000000        3.600000        3.600000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        50.000000       0.000000        0.000000
33      14      12322   0.000000        3.600000        3.600000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        50.000000       0.000000        0.000000
33      14      12411   0.000000        3.600000        3.600000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        50.000000       0.000000        0.000000
33      14      12412   0.000000        3.600000        3.600000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        50.000000       0.000000        0.000000
33      14      12421   0.000000        3.600000        3.600000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        50.000000       0.000000        0.000000
33      14      12422   0.000000        3.600000        3.600000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        50.000000       0.000000        0.000000
33      14      13111   0.000000        0.720000        0.720000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        50.000000       0.000000        0.000000
33      14      13112   0.000000        0.720000        0.720000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        50.000000       0.000000        0.000000
33      14      13121   0.000000        0.720000        0.720000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        50.000000       0.000000        0.000000
33      14      13122   0.000000        0.720000        0.720000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        50.000000       0.000000        0.000000
33      14      13211   0.000000        0.720000        0.720000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        50.000000       0.000000        0.000000
33      14      13212   0.000000        0.720000        0.720000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        50.000000       0.000000        0.000000
33      14      13221   0.000000        0.720000        0.720000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        50.000000       0.000000        0.000000
33      14      13222   0.000000        0.720000        0.720000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        50.000000       0.000000        0.000000
33      14      13231   0.000000        0.720000        0.720000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        50.000000       0.000000        0.000000
33      14      13232   0.000000        0.720000        0.720000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        50.000000       0.000000        0.000000
33      14      13311   0.000000        0.720000        0.720000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        50.000000       0.000000        0.000000
33      14      13312   0.000000        0.720000        0.720000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        50.000000       0.000000        0.000000
33      14      13321   0.000000        0.720000        0.720000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        50.000000       0.000000        0.000000
33      14      13322   0.000000        0.720000        0.720000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        50.000000       0.000000        0.000000
33      14      13331   0.000000        0.720000        0.720000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        50.000000       0.000000        0.000000
33      14      13411   0.000000        0.720000        0.720000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        50.000000       0.000000        0.000000
33      14      13412   0.000000        0.720000        0.720000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        50.000000       0.000000        0.000000
33      14      13421   0.000000        0.720000        0.720000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        50.000000       0.000000        0.000000
33      14      13422   0.000000        0.720000        0.720000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        50.000000       0.000000        0.000000
33      14      13431   0.000000        0.720000        0.720000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        50.000000       0.000000        0.000000
33      14      13432   0.000000        0.720000        0.720000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        50.000000       0.000000        0.000000
33      14      14121   0.000000        0.720000        0.720000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        50.000000       0.000000        0.000000
33      14      14122   0.000000        0.720000        0.720000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        50.000000       0.000000        0.000000
33      14      14131   0.000000        0.720000        0.720000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        50.000000       0.000000        0.000000
33      14      14132   0.000000        0.720000        0.720000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        50.000000       0.000000        0.000000
33      14      14221   0.000000        0.720000        0.720000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        50.000000       0.000000        0.000000
```

```
33      14      14222   0.000000       0.720000       0.720000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       50.000000      0.000000       0.000000
33      14      14231   0.000000       0.720000       0.720000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       50.000000      0.000000       0.000000
33      14      14232   0.000000       0.720000       0.720000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       50.000000      0.000000       0.000000
33      14      14321   0.000000       0.720000       0.720000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       50.000000      0.000000       0.000000
33      14      14322   0.000000       0.720000       0.720000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       50.000000      0.000000       0.000000
33      14      14331   0.000000       0.720000       0.720000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       50.000000      0.000000       0.000000
33      14      14332   0.000000       0.720000       0.720000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       50.000000      0.000000       0.000000
33      14      14421   0.000000       0.720000       0.720000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       50.000000      0.000000       0.000000
33      14      14422   0.000000       0.720000       0.720000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       50.000000      0.000000       0.000000
33      14      14431   0.000000       0.720000       0.720000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       50.000000      0.000000       0.000000
33      14      14432   0.000000       0.720000       0.720000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       50.000000      0.000000       0.000000
33      14      15121   0.000000       0.720000       0.720000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       50.000000      0.000000       0.000000
33      14      15122   0.000000       0.720000       0.720000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       50.000000      0.000000       0.000000
33      14      15131   0.000000       0.720000       0.720000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       50.000000      0.000000       0.000000
33      14      15132   0.000000       0.720000       0.720000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       50.000000      0.000000       0.000000
33      14      15221   0.000000       0.720000       0.720000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       50.000000      0.000000       0.000000
33      14      15222   0.000000       0.720000       0.720000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       50.000000      0.000000       0.000000
33      14      15231   0.000000       0.720000       0.720000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       50.000000      0.000000       0.000000
33      14      15232   0.000000       0.720000       0.720000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       50.000000      0.000000       0.000000
33      14      15321   0.000000       0.720000       0.720000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       50.000000      0.000000       0.000000
33      14      15322   0.000000       0.720000       0.720000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       50.000000      0.000000       0.000000
33      14      15331   0.000000       0.720000       0.720000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       50.000000      0.000000       0.000000
33      14      15332   0.000000       0.720000       0.720000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       50.000000      0.000000       0.000000
33      14      15421   0.000000       0.720000       0.720000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       50.000000      0.000000       0.000000
33      14      15422   0.000000       0.720000       0.720000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       50.000000      0.000000       0.000000
33      14      15431   0.000000       0.720000       0.720000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       50.000000      0.000000       0.000000
33      14      15432   0.000000       0.720000       0.720000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       50.000000      0.000000       0.000000
33      14      16000   0.000000       0.000000       0.000000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
40      3       1000    0.000000       0.000000       0.000000       0.000000       0.001000
0.500000       0.800000       0.000000       0.000000       0.000000       0.000000       0.000000
40      3       2000    0.000000       0.000000       0.000000       0.000000       0.001000
0.500000       0.800000       0.000000       0.000000       0.000000       0.000000       0.000000
40      3       3000    0.000000       0.000000       0.000000       0.000000       0.001000
0.500000       0.800000       0.000000       0.000000       0.000000       0.000000       0.000000
40      3       4000    0.000000       0.000000       0.000000       0.000000       0.060000
1.400000       0.600000       0.000000       0.000000       0.000000       0.000000       0.000000
40      3       5000    0.000000       0.000000       0.000000       0.000000       0.080000
1.400000       0.600000       0.000000       0.000000       0.000000       0.000000       0.000000
40      3       6000    0.000000       0.000000       0.000000       0.000000       0.200000
0.800000       0.800000       0.000000       0.000000       0.000000       0.000000       0.000000
40      3       7000    0.000000       0.000000       0.000000       0.000000       0.100000
0.800000       0.900000       0.000000       0.000000       0.000000       0.000000       0.000000
40      3       8000    0.000000       0.000000       0.000000       0.000000       0.020000
0.800000       0.600000       0.000000       0.000000       0.000000       0.000000       0.000000
40      3       9000    0.000000       0.000000       0.000000       0.000000       0.020000
0.800000       0.600000       0.000000       0.000000       0.000000       0.000000       0.000000
40      3       10000   0.000000       0.000000       0.000000       0.000000       0.000000
0.000001       1.640000       4.000000       0.000000       0.000000       0.000000       0.000000
40      3       11111   0.000000       0.000000       0.000000       0.000000       0.010000
0.800000       1.640000       0.000000       1.000000       0.300000       0.000000       0.000000
```

```
40     3       11112  0.000000       0.000000       0.000000       0.000000       0.010000
0.800000       1.640000       0.000000       1.000000       0.300000       0.000000       0.000000
40     3       11121  0.000000       0.000000       0.000000       0.000000       0.010000
0.800000       1.640000       0.000000       1.000000       0.300000       0.000000       0.000000
40     3       11122  0.000000       0.000000       0.000000       0.000000       0.010000
0.800000       1.640000       0.000000       1.000000       0.300000       0.000000       0.000000
40     3       11211  0.000000       0.000000       0.000000       0.000000       0.010000
0.800000       1.640000       0.000000       1.000000       0.300000       0.000000       0.000000
40     3       11212  0.000000       0.000000       0.000000       0.000000       0.010000
0.800000       1.640000       0.000000       1.000000       0.300000       0.000000       0.000000
40     3       11221  0.000000       0.000000       0.000000       0.000000       0.010000
0.800000       1.640000       0.000000       1.000000       0.300000       0.000000       0.000000
40     3       11222  0.000000       0.000000       0.000000       0.000000       0.010000
0.800000       1.640000       0.000000       1.000000       0.300000       0.000000       0.000000
40     3       11311  0.000000       0.000000       0.000000       0.000000       0.010000
0.800000       1.640000       0.000000       1.000000       0.300000       0.000000       0.000000
40     3       11312  0.000000       0.000000       0.000000       0.000000       0.010000
0.800000       1.640000       0.000000       1.000000       0.300000       0.000000       0.000000
40     3       11321  0.000000       0.000000       0.000000       0.000000       0.010000
0.800000       1.640000       0.000000       1.000000       0.300000       0.000000       0.000000
40     3       11322  0.000000       0.000000       0.000000       0.000000       0.010000
0.800000       1.640000       0.000000       1.000000       0.300000       0.000000       0.000000
40     3       11411  0.000000       0.000000       0.000000       0.000000       0.010000
0.800000       1.640000       0.000000       1.000000       0.300000       0.000000       0.000000
40     3       11412  0.000000       0.000000       0.000000       0.000000       0.010000
0.800000       1.640000       0.000000       1.000000       0.300000       0.000000       0.000000
40     3       11421  0.000000       0.000000       0.000000       0.000000       0.010000
0.800000       1.640000       0.000000       1.000000       0.300000       0.000000       0.000000
40     3       11422  0.000000       0.000000       0.000000       0.000000       0.010000
0.800000       1.640000       0.000000       1.000000       0.300000       0.000000       0.000000
40     3       12111  0.000000       0.000000       0.000000       0.000000       0.010000
0.800000       1.640000       0.000000       1.000000       0.300000       0.000000       0.000000
40     3       12112  0.000000       0.000000       0.000000       0.000000       0.010000
0.800000       1.640000       0.000000       1.000000       0.300000       0.000000       0.000000
40     3       12121  0.000000       0.000000       0.000000       0.000000       0.010000
0.800000       1.640000       0.000000       1.000000       0.300000       0.000000       0.000000
40     3       12122  0.000000       0.000000       0.000000       0.000000       0.010000
0.800000       1.640000       0.000000       1.000000       0.300000       0.000000       0.000000
40     3       12211  0.000000       0.000000       0.000000       0.000000       0.010000
0.800000       1.640000       0.000000       1.000000       0.300000       0.000000       0.000000
40     3       12212  0.000000       0.000000       0.000000       0.000000       0.010000
0.800000       1.640000       0.000000       1.000000       0.300000       0.000000       0.000000
40     3       12221  0.000000       0.000000       0.000000       0.000000       0.010000
0.800000       1.640000       0.000000       1.000000       0.300000       0.000000       0.000000
40     3       12222  0.000000       0.000000       0.000000       0.000000       0.010000
0.800000       1.640000       0.000000       1.000000       0.300000       0.000000       0.000000
40     3       12311  0.000000       0.000000       0.000000       0.000000       0.010000
0.800000       1.640000       0.000000       1.000000       0.300000       0.000000       0.000000
40     3       12312  0.000000       0.000000       0.000000       0.000000       0.010000
0.800000       1.640000       0.000000       1.000000       0.300000       0.000000       0.000000
40     3       12321  0.000000       0.000000       0.000000       0.000000       0.010000
0.800000       1.640000       0.000000       1.000000       0.300000       0.000000       0.000000
40     3       12322  0.000000       0.000000       0.000000       0.000000       0.010000
0.800000       1.640000       0.000000       1.000000       0.300000       0.000000       0.000000
40     3       12411  0.000000       0.000000       0.000000       0.000000       0.010000
0.800000       1.640000       0.000000       1.000000       0.300000       0.000000       0.000000
40     3       12412  0.000000       0.000000       0.000000       0.000000       0.010000
0.800000       1.640000       0.000000       1.000000       0.300000       0.000000       0.000000
40     3       12421  0.000000       0.000000       0.000000       0.000000       0.010000
0.800000       1.640000       0.000000       1.000000       0.300000       0.000000       0.000000
40     3       12422  0.000000       0.000000       0.000000       0.000000       0.010000
0.800000       1.640000       0.000000       1.000000       0.300000       0.000000       0.000000
40     3       13111  0.000000       0.000000       0.000000       0.000000       1.500000
8.000000       1.640000       0.000000       1.000000       0.300000       0.000000       0.000000
40     3       13112  0.000000       0.000000       0.000000       0.000000       1.500000
8.000000       1.640000       0.000000       1.000000       0.300000       0.000000       0.000000
40     3       13121  0.000000       0.000000       0.000000       0.000000       1.500000
8.000000       1.640000       0.000000       1.000000       0.300000       0.000000       0.000000
40     3       13122  0.000000       0.000000       0.000000       0.000000       1.500000
8.000000       1.640000       0.000000       1.000000       0.300000       0.000000       0.000000
40     3       13211  0.000000       0.000000       0.000000       0.000000       1.500000
8.000000       1.640000       0.000000       1.000000       0.300000       0.000000       0.000000
40     3       13212  0.000000       0.000000       0.000000       0.000000       1.500000
8.000000       1.640000       0.000000       1.000000       0.300000       0.000000       0.000000
40     3       13221  0.000000       0.000000       0.000000       0.000000       1.500000
8.000000       1.640000       0.000000       1.000000       0.300000       0.000000       0.000000
40     3       13222  0.000000       0.000000       0.000000       0.000000       1.500000
8.000000       1.640000       0.000000       1.000000       0.300000       0.000000       0.000000
```

```
40      3       13231   0.000000        0.000000        0.000000        0.000000        1.500000
8.000000        1.640000        0.000000        1.000000        0.300000        0.000000        0.000000
40      3       13232   0.000000        0.000000        0.000000        0.000000        1.500000
8.000000        1.640000        0.000000        1.000000        0.300000        0.000000        0.000000
40      3       13311   0.000000        0.000000        0.000000        0.000000        1.500000
8.000000        1.640000        0.000000        1.000000        0.300000        0.000000        0.000000
40      3       13312   0.000000        0.000000        0.000000        0.000000        1.500000
8.000000        1.640000        0.000000        1.000000        0.300000        0.000000        0.000000
40      3       13321   0.000000        0.000000        0.000000        0.000000        1.500000
8.000000        1.640000        0.000000        1.000000        0.300000        0.000000        0.000000
40      3       13322   0.000000        0.000000        0.000000        0.000000        1.500000
8.000000        1.640000        0.000000        1.000000        0.300000        0.000000        0.000000
40      3       13331   0.000000        0.000000        0.000000        0.000000        1.500000
8.000000        1.640000        0.000000        1.000000        0.300000        0.000000        0.000000
40      3       13411   0.000000        0.000000        0.000000        0.000000        1.500000
8.000000        1.640000        0.000000        1.000000        0.300000        0.000000        0.000000
40      3       13412   0.000000        0.000000        0.000000        0.000000        1.500000
8.000000        1.640000        0.000000        1.000000        0.300000        0.000000        0.000000
40      3       13421   0.000000        0.000000        0.000000        0.000000        1.500000
8.000000        1.640000        0.000000        1.000000        0.300000        0.000000        0.000000
40      3       13422   0.000000        0.000000        0.000000        0.000000        1.500000
8.000000        1.640000        0.000000        1.000000        0.300000        0.000000        0.000000
40      3       13431   0.000000        0.000000        0.000000        0.000000        1.500000
8.000000        1.640000        0.000000        1.000000        0.300000        0.000000        0.000000
40      3       13432   0.000000        0.000000        0.000000        0.000000        1.500000
8.000000        1.640000        0.000000        1.000000        0.300000        0.000000        0.000000
40      3       14121   0.000000        0.000000        0.000000        0.000000        0.050000
0.500000        1.640000        0.000000        1.000000        0.300000        0.000000        0.000000
40      3       14122   0.000000        0.000000        0.000000        0.000000        0.050000
0.500000        1.640000        0.000000        1.000000        0.300000        0.000000        0.000000
40      3       14131   0.000000        0.000000        0.000000        0.000000        0.050000
0.500000        1.640000        0.000000        1.000000        0.300000        0.000000        0.000000
40      3       14132   0.000000        0.000000        0.000000        0.000000        0.050000
0.500000        1.640000        0.000000        1.000000        0.300000        0.000000        0.000000
40      3       14221   0.000000        0.000000        0.000000        0.000000        0.050000
0.500000        1.640000        0.000000        1.000000        0.300000        0.000000        0.000000
40      3       14222   0.000000        0.000000        0.000000        0.000000        0.050000
0.500000        1.640000        0.000000        1.000000        0.300000        0.000000        0.000000
40      3       14231   0.000000        0.000000        0.000000        0.000000        0.050000
0.500000        1.640000        0.000000        1.000000        0.300000        0.000000        0.000000
40      3       14232   0.000000        0.000000        0.000000        0.000000        0.050000
0.500000        1.640000        0.000000        1.000000        0.300000        0.000000        0.000000
40      3       14321   0.000000        0.000000        0.000000        0.000000        0.050000
0.500000        1.640000        0.000000        1.000000        0.300000        0.000000        0.000000
40      3       14322   0.000000        0.000000        0.000000        0.000000        0.050000
0.500000        1.640000        0.000000        1.000000        0.300000        0.000000        0.000000
40      3       14331   0.000000        0.000000        0.000000        0.000000        0.050000
0.500000        1.640000        0.000000        1.000000        0.300000        0.000000        0.000000
40      3       14332   0.000000        0.000000        0.000000        0.000000        0.050000
0.500000        1.640000        0.000000        1.000000        0.300000        0.000000        0.000000
40      3       14421   0.000000        0.000000        0.000000        0.000000        0.050000
0.500000        1.640000        0.000000        1.000000        0.300000        0.000000        0.000000
40      3       14422   0.000000        0.000000        0.000000        0.000000        0.050000
0.500000        1.640000        0.000000        1.000000        0.300000        0.000000        0.000000
40      3       14431   0.000000        0.000000        0.000000        0.000000        0.050000
0.500000        1.640000        0.000000        1.000000        0.300000        0.000000        0.000000
40      3       14432   0.000000        0.000000        0.000000        0.000000        0.050000
0.500000        1.640000        0.000000        1.000000        0.300000        0.000000        0.000000
40      3       15121   0.000000        0.000000        0.000000        0.000000        0.050000
0.500000        1.640000        0.000000        1.000000        0.300000        0.000000        0.000000
40      3       15122   0.000000        0.000000        0.000000        0.000000        0.050000
0.500000        1.640000        0.000000        1.000000        0.300000        0.000000        0.000000
40      3       15131   0.000000        0.000000        0.000000        0.000000        0.050000
0.500000        1.640000        0.000000        1.000000        0.300000        0.000000        0.000000
40      3       15132   0.000000        0.000000        0.000000        0.000000        0.050000
0.500000        1.640000        0.000000        1.000000        0.300000        0.000000        0.000000
40      3       15221   0.000000        0.000000        0.000000        0.000000        0.050000
0.500000        1.640000        0.000000        1.000000        0.300000        0.000000        0.000000
40      3       15222   0.000000        0.000000        0.000000        0.000000        0.050000
0.500000        1.640000        0.000000        1.000000        0.300000        0.000000        0.000000
40      3       15231   0.000000        0.000000        0.000000        0.000000        0.050000
0.500000        1.640000        0.000000        1.000000        0.300000        0.000000        0.000000
40      3       15232   0.000000        0.000000        0.000000        0.000000        0.050000
0.500000        1.640000        0.000000        1.000000        0.300000        0.000000        0.000000
40      3       15321   0.000000        0.000000        0.000000        0.000000        0.050000
0.500000        1.640000        0.000000        1.000000        0.300000        0.000000        0.000000
40      3       15322   0.000000        0.000000        0.000000        0.000000        0.050000
0.500000        1.640000        0.000000        1.000000        0.300000        0.000000        0.000000
```

```
40      3       15331   0.000000        0.000000        0.000000        0.000000        0.050000
0.500000        1.640000        0.000000        1.000000        0.300000        0.000000        0.000000
40      3       15332   0.000000        0.000000        0.000000        0.000000        0.050000
0.500000        1.640000        0.000000        1.000000        0.300000        0.000000        0.000000
40      3       15421   0.000000        0.000000        0.000000        0.000000        0.050000
0.500000        1.640000        0.000000        1.000000        0.300000        0.000000        0.000000
40      3       15422   0.000000        0.000000        0.000000        0.000000        0.050000
0.500000        1.640000        0.000000        1.000000        0.300000        0.000000        0.000000
40      3       15431   0.000000        0.000000        0.000000        0.000000        0.050000
0.500000        1.640000        0.000000        1.000000        0.300000        0.000000        0.000000
40      3       15432   0.000000        0.000000        0.000000        0.000000        0.050000
0.500000        1.640000        0.000000        1.000000        0.300000        0.000000        0.000000
40      3       16000   0.000000        0.000000        0.000000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      7       1000    0.000000        4.462500        4.462500        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      7       2000    0.000000        4.462500        4.462500        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      7       3000    0.000000        4.462500        4.462500        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      7       4000    0.000000        7.350000        7.350000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      7       5000    0.000000        6.825000        6.825000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      7       6000    0.000000        7.875000        7.875000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      7       7000    0.000000        7.350000        7.350000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      7       8000    0.000000        1.050000        1.050000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      7       9000    0.000000        1.050000        1.050000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      7       10000   0.000000        0.000000        0.000000        0.000000        0.000000
0.000001        1.640000        0.400000        0.000000        0.000000        0.000000        0.000000
40      7       11111   0.000000        2.000000        2.000000        0.000000        0.000000
0.000001        1.640000        0.000000        0.400000        0.200000        0.000000        0.000000
40      7       11112   0.000000        2.000000        2.000000        0.000000        0.000000
0.000001        1.640000        0.000000        0.400000        0.200000        0.000000        0.000000
40      7       11121   0.000000        2.000000        2.000000        0.000000        0.000000
0.000001        1.640000        0.000000        0.400000        0.200000        0.000000        0.000000
40      7       11122   0.000000        2.000000        2.000000        0.000000        0.000000
0.000001        1.640000        0.000000        0.400000        0.200000        0.000000        0.000000
40      7       11211   0.000000        2.000000        2.000000        0.000000        0.000000
0.000001        1.640000        0.000000        0.400000        0.200000        0.000000        0.000000
40      7       11212   0.000000        2.000000        2.000000        0.000000        0.000000
0.000001        1.640000        0.000000        0.400000        0.200000        0.000000        0.000000
40      7       11221   0.000000        2.000000        2.000000        0.000000        0.000000
0.000001        1.640000        0.000000        0.400000        0.200000        0.000000        0.000000
40      7       11222   0.000000        2.000000        2.000000        0.000000        0.000000
0.000001        1.640000        0.000000        0.400000        0.200000        0.000000        0.000000
40      7       11311   0.000000        2.000000        2.000000        0.000000        0.000000
0.000001        1.640000        0.000000        0.400000        0.200000        0.000000        0.000000
40      7       11312   0.000000        2.000000        2.000000        0.000000        0.000000
0.000001        1.640000        0.000000        0.400000        0.200000        0.000000        0.000000
40      7       11321   0.000000        2.000000        2.000000        0.000000        0.000000
0.000001        1.640000        0.000000        0.400000        0.200000        0.000000        0.000000
40      7       11322   0.000000        2.000000        2.000000        0.000000        0.000000
0.000001        1.640000        0.000000        0.400000        0.200000        0.000000        0.000000
40      7       11411   0.000000        2.000000        2.000000        0.000000        0.000000
0.000001        1.640000        0.000000        0.400000        0.200000        0.000000        0.000000
40      7       11412   0.000000        2.000000        2.000000        0.000000        0.000000
0.000001        1.640000        0.000000        0.400000        0.200000        0.000000        0.000000
40      7       11421   0.000000        2.000000        2.000000        0.000000        0.000000
0.000001        1.640000        0.000000        0.400000        0.200000        0.000000        0.000000
40      7       11422   0.000000        2.000000        2.000000        0.000000        0.000000
0.000001        1.640000        0.000000        0.400000        0.200000        0.000000        0.000000
40      7       12111   0.000000        2.000000        2.000000        0.000000        0.000000
0.000001        1.640000        0.000000        0.400000        0.200000        0.000000        0.000000
40      7       12112   0.000000        2.000000        2.000000        0.000000        0.000000
0.000001        1.640000        0.000000        0.400000        0.200000        0.000000        0.000000
40      7       12121   0.000000        2.000000        2.000000        0.000000        0.000000
0.000001        1.640000        0.000000        0.400000        0.200000        0.000000        0.000000
40      7       12122   0.000000        2.000000        2.000000        0.000000        0.000000
0.000001        1.640000        0.000000        0.400000        0.200000        0.000000        0.000000
40      7       12211   0.000000        2.000000        2.000000        0.000000        0.000000
0.000001        1.640000        0.000000        0.400000        0.200000        0.000000        0.000000
40      7       12212   0.000000        2.000000        2.000000        0.000000        0.000000
0.000001        1.640000        0.000000        0.400000        0.200000        0.000000        0.000000
```

```
40     7       12221  0.000000       2.000000       2.000000       0.000000       0.000000
0.000001       1.640000       0.000000       0.400000       0.200000       0.000000       0.000000
40     7       12222  0.000000       2.000000       2.000000       0.000000       0.000000
0.000001       1.640000       0.000000       0.400000       0.200000       0.000000       0.000000
40     7       12311  0.000000       2.000000       2.000000       0.000000       0.000000
0.000001       1.640000       0.000000       0.400000       0.200000       0.000000       0.000000
40     7       12312  0.000000       2.000000       2.000000       0.000000       0.000000
0.000001       1.640000       0.000000       0.400000       0.200000       0.000000       0.000000
40     7       12321  0.000000       2.000000       2.000000       0.000000       0.000000
0.000001       1.640000       0.000000       0.400000       0.200000       0.000000       0.000000
40     7       12322  0.000000       2.000000       2.000000       0.000000       0.000000
0.000001       1.640000       0.000000       0.400000       0.200000       0.000000       0.000000
40     7       12411  0.000000       2.000000       2.000000       0.000000       0.000000
0.000001       1.640000       0.000000       0.400000       0.200000       0.000000       0.000000
40     7       12412  0.000000       2.000000       2.000000       0.000000       0.000000
0.000001       1.640000       0.000000       0.400000       0.200000       0.000000       0.000000
40     7       12421  0.000000       2.000000       2.000000       0.000000       0.000000
0.000001       1.640000       0.000000       0.400000       0.200000       0.000000       0.000000
40     7       12422  0.000000       2.000000       2.000000       0.000000       0.000000
0.000001       1.640000       0.000000       0.400000       0.200000       0.000000       0.000000
40     7       13111  0.000000       8.000000       8.000000       0.000000       0.000000
0.000001       1.640000       0.000000       1.200000       0.600000       0.000000       0.000000
40     7       13112  0.000000       8.000000       8.000000       0.000000       0.000000
0.000001       1.640000       0.000000       1.200000       0.600000       0.000000       0.000000
40     7       13121  0.000000       8.000000       8.000000       0.000000       0.000000
0.000001       1.640000       0.000000       1.200000       0.600000       0.000000       0.000000
40     7       13122  0.000000       8.000000       8.000000       0.000000       0.000000
0.000001       1.640000       0.000000       1.200000       0.600000       0.000000       0.000000
40     7       13211  0.000000       8.000000       8.000000       0.000000       0.000000
0.000001       1.640000       0.000000       1.200000       0.600000       0.000000       0.000000
40     7       13212  0.000000       8.000000       8.000000       0.000000       0.000000
0.000001       1.640000       0.000000       1.200000       0.600000       0.000000       0.000000
40     7       13221  0.000000       8.000000       8.000000       0.000000       0.000000
0.000001       1.640000       0.000000       1.200000       0.600000       0.000000       0.000000
40     7       13222  0.000000       8.000000       8.000000       0.000000       0.000000
0.000001       1.640000       0.000000       1.200000       0.600000       0.000000       0.000000
40     7       13231  0.000000       8.000000       8.000000       0.000000       0.000000
0.000001       1.640000       0.000000       1.200000       0.600000       0.000000       0.000000
40     7       13232  0.000000       8.000000       8.000000       0.000000       0.000000
0.000001       1.640000       0.000000       1.200000       0.600000       0.000000       0.000000
40     7       13311  0.000000       8.000000       8.000000       0.000000       0.000000
0.000001       1.640000       0.000000       1.200000       0.600000       0.000000       0.000000
40     7       13312  0.000000       8.000000       8.000000       0.000000       0.000000
0.000001       1.640000       0.000000       1.200000       0.600000       0.000000       0.000000
40     7       13321  0.000000       8.000000       8.000000       0.000000       0.000000
0.000001       1.640000       0.000000       1.200000       0.600000       0.000000       0.000000
40     7       13322  0.000000       8.000000       8.000000       0.000000       0.000000
0.000001       1.640000       0.000000       1.200000       0.600000       0.000000       0.000000
40     7       13331  0.000000       8.000000       8.000000       0.000000       0.000000
0.000001       1.640000       0.000000       1.200000       0.600000       0.000000       0.000000
40     7       13411  0.000000       8.000000       8.000000       0.000000       0.000000
0.000001       1.640000       0.000000       1.200000       0.600000       0.000000       0.000000
40     7       13412  0.000000       8.000000       8.000000       0.000000       0.000000
0.000001       1.640000       0.000000       1.200000       0.600000       0.000000       0.000000
40     7       13421  0.000000       8.000000       8.000000       0.000000       0.000000
0.000001       1.640000       0.000000       1.200000       0.600000       0.000000       0.000000
40     7       13422  0.000000       8.000000       8.000000       0.000000       0.000000
0.000001       1.640000       0.000000       1.200000       0.600000       0.000000       0.000000
40     7       13431  0.000000       8.000000       8.000000       0.000000       0.000000
0.000001       1.640000       0.000000       1.200000       0.600000       0.000000       0.000000
40     7       13432  0.000000       8.000000       8.000000       0.000000       0.000000
0.000001       1.640000       0.000000       1.200000       0.600000       0.000000       0.000000
40     7       14121  0.000000       2.000000       2.000000       0.000000       0.000000
0.000001       1.640000       0.000000       0.200000       0.200000       0.000000       0.000000
40     7       14122  0.000000       2.000000       2.000000       0.000000       0.000000
0.000001       1.640000       0.000000       0.200000       0.200000       0.000000       0.000000
40     7       14131  0.000000       2.000000       2.000000       0.000000       0.000000
0.000001       1.640000       0.000000       0.200000       0.200000       0.000000       0.000000
40     7       14132  0.000000       2.000000       2.000000       0.000000       0.000000
0.000001       1.640000       0.000000       0.200000       0.200000       0.000000       0.000000
40     7       14221  0.000000       2.000000       2.000000       0.000000       0.000000
0.000001       1.640000       0.000000       0.200000       0.200000       0.000000       0.000000
40     7       14222  0.000000       2.000000       2.000000       0.000000       0.000000
0.000001       1.640000       0.000000       0.200000       0.200000       0.000000       0.000000
40     7       14231  0.000000       2.000000       2.000000       0.000000       0.000000
0.000001       1.640000       0.000000       0.200000       0.200000       0.000000       0.000000
40     7       14232  0.000000       2.000000       2.000000       0.000000       0.000000
0.000001       1.640000       0.000000       0.200000       0.200000       0.000000       0.000000
```

```
40      7       14321   0.000000        2.000000        2.000000        0.000000        0.000000
0.000001        1.640000        0.000000        0.200000        0.200000        0.000000        0.000000
40      7       14322   0.000000        2.000000        2.000000        0.000000        0.000000
0.000001        1.640000        0.000000        0.200000        0.200000        0.000000        0.000000
40      7       14331   0.000000        2.000000        2.000000        0.000000        0.000000
0.000001        1.640000        0.000000        0.200000        0.200000        0.000000        0.000000
40      7       14332   0.000000        2.000000        2.000000        0.000000        0.000000
0.000001        1.640000        0.000000        0.200000        0.200000        0.000000        0.000000
40      7       14421   0.000000        2.000000        2.000000        0.000000        0.000000
0.000001        1.640000        0.000000        0.200000        0.200000        0.000000        0.000000
40      7       14422   0.000000        2.000000        2.000000        0.000000        0.000000
0.000001        1.640000        0.000000        0.200000        0.200000        0.000000        0.000000
40      7       14431   0.000000        2.000000        2.000000        0.000000        0.000000
0.000001        1.640000        0.000000        0.200000        0.200000        0.000000        0.000000
40      7       14432   0.000000        2.000000        2.000000        0.000000        0.000000
0.000001        1.640000        0.000000        0.200000        0.200000        0.000000        0.000000
40      7       15121   0.000000        2.000000        2.000000        0.000000        0.000000
0.000001        1.640000        0.000000        0.200000        0.200000        0.000000        0.000000
40      7       15122   0.000000        2.000000        2.000000        0.000000        0.000000
0.000001        1.640000        0.000000        0.200000        0.200000        0.000000        0.000000
40      7       15131   0.000000        2.000000        2.000000        0.000000        0.000000
0.000001        1.640000        0.000000        0.200000        0.200000        0.000000        0.000000
40      7       15132   0.000000        2.000000        2.000000        0.000000        0.000000
0.000001        1.640000        0.000000        0.200000        0.200000        0.000000        0.000000
40      7       15221   0.000000        2.000000        2.000000        0.000000        0.000000
0.000001        1.640000        0.000000        0.200000        0.200000        0.000000        0.000000
40      7       15222   0.000000        2.000000        2.000000        0.000000        0.000000
0.000001        1.640000        0.000000        0.200000        0.200000        0.000000        0.000000
40      7       15231   0.000000        2.000000        2.000000        0.000000        0.000000
0.000001        1.640000        0.000000        0.200000        0.200000        0.000000        0.000000
40      7       15232   0.000000        2.000000        2.000000        0.000000        0.000000
0.000001        1.640000        0.000000        0.200000        0.200000        0.000000        0.000000
40      7       15321   0.000000        2.000000        2.000000        0.000000        0.000000
0.000001        1.640000        0.000000        0.200000        0.200000        0.000000        0.000000
40      7       15322   0.000000        2.000000        2.000000        0.000000        0.000000
0.000001        1.640000        0.000000        0.200000        0.200000        0.000000        0.000000
40      7       15331   0.000000        2.000000        2.000000        0.000000        0.000000
0.000001        1.640000        0.000000        0.200000        0.200000        0.000000        0.000000
40      7       15332   0.000000        2.000000        2.000000        0.000000        0.000000
0.000001        1.640000        0.000000        0.200000        0.200000        0.000000        0.000000
40      7       15421   0.000000        2.000000        2.000000        0.000000        0.000000
0.000001        1.640000        0.000000        0.200000        0.200000        0.000000        0.000000
40      7       15422   0.000000        2.000000        2.000000        0.000000        0.000000
0.000001        1.640000        0.000000        0.200000        0.200000        0.000000        0.000000
40      7       15431   0.000000        2.000000        2.000000        0.000000        0.000000
0.000001        1.640000        0.000000        0.200000        0.200000        0.000000        0.000000
40      7       15432   0.000000        2.000000        2.000000        0.000000        0.000000
0.000001        1.640000        0.000000        0.200000        0.200000        0.000000        0.000000
40      7       16000   0.000000        0.000000        0.000000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      10      1000    0.000000        0.017500        0.017500        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      10      2000    0.000000        0.015000        0.015000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      10      3000    0.000000        0.012000        0.012000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      10      4000    0.000000        0.015000        0.015000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      10      5000    0.000000        0.007500        0.007500        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      10      6000    0.000000        0.020000        0.020000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      10      7000    0.000000        0.025000        0.025000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      10      8000    0.000000        0.011250        0.011250        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      10      9000    0.000000        0.003750        0.003750        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      10      10000   0.000000        0.000000        0.000000        0.000000        0.000000
0.000001        1.640000        0.100000        0.000000        0.000000        0.000000        0.000000
40      10      11111   0.000000        0.005000        0.005000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      10      11112   0.000000        0.005000        0.005000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      10      11121   0.000000        0.005000        0.005000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      10      11122   0.000000        0.005000        0.005000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
```

```
40      10      11211   0.000000        0.005000        0.005000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      10      11212   0.000000        0.005000        0.005000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      10      11221   0.000000        0.005000        0.005000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      10      11222   0.000000        0.005000        0.005000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      10      11311   0.000000        0.005000        0.005000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      10      11312   0.000000        0.005000        0.005000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      10      11321   0.000000        0.005000        0.005000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      10      11322   0.000000        0.005000        0.005000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      10      11411   0.000000        0.005000        0.005000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      10      11412   0.000000        0.005000        0.005000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      10      11421   0.000000        0.005000        0.005000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      10      11422   0.000000        0.005000        0.005000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      10      12111   0.000000        0.005000        0.005000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      10      12112   0.000000        0.005000        0.005000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      10      12121   0.000000        0.005000        0.005000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      10      12122   0.000000        0.005000        0.005000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      10      12211   0.000000        0.005000        0.005000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      10      12212   0.000000        0.005000        0.005000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      10      12221   0.000000        0.005000        0.005000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      10      12222   0.000000        0.005000        0.005000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      10      12311   0.000000        0.005000        0.005000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      10      12312   0.000000        0.005000        0.005000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      10      12321   0.000000        0.005000        0.005000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      10      12322   0.000000        0.005000        0.005000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      10      12411   0.000000        0.005000        0.005000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      10      12412   0.000000        0.005000        0.005000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      10      12421   0.000000        0.005000        0.005000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      10      12422   0.000000        0.005000        0.005000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      10      13111   0.000000        0.001000        0.001000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      10      13112   0.000000        0.001000        0.001000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      10      13121   0.000000        0.001000        0.001000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      10      13122   0.000000        0.001000        0.001000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      10      13211   0.000000        0.001000        0.001000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      10      13212   0.000000        0.001000        0.001000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      10      13221   0.000000        0.001000        0.001000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      10      13222   0.000000        0.001000        0.001000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      10      13231   0.000000        0.001000        0.001000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      10      13232   0.000000        0.001000        0.001000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      10      13311   0.000000        0.001000        0.001000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
```

```
40      10      13312  0.000000       0.001000       0.001000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
40      10      13321  0.000000       0.001000       0.001000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
40      10      13322  0.000000       0.001000       0.001000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
40      10      13331  0.000000       0.001000       0.001000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
40      10      13411  0.000000       0.001000       0.001000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
40      10      13412  0.000000       0.001000       0.001000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
40      10      13421  0.000000       0.001000       0.001000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
40      10      13422  0.000000       0.001000       0.001000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
40      10      13431  0.000000       0.001000       0.001000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
40      10      13432  0.000000       0.001000       0.001000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
40      10      14121  0.000000       0.001000       0.001000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
40      10      14122  0.000000       0.001000       0.001000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
40      10      14131  0.000000       0.001000       0.001000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
40      10      14132  0.000000       0.001000       0.001000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
40      10      14221  0.000000       0.001000       0.001000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
40      10      14222  0.000000       0.001000       0.001000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
40      10      14231  0.000000       0.001000       0.001000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
40      10      14232  0.000000       0.001000       0.001000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
40      10      14321  0.000000       0.001000       0.001000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
40      10      14322  0.000000       0.001000       0.001000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
40      10      14331  0.000000       0.001000       0.001000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
40      10      14332  0.000000       0.001000       0.001000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
40      10      14421  0.000000       0.001000       0.001000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
40      10      14422  0.000000       0.001000       0.001000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
40      10      14431  0.000000       0.001000       0.001000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
40      10      14432  0.000000       0.001000       0.001000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
40      10      15121  0.000000       0.001000       0.001000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
40      10      15122  0.000000       0.001000       0.001000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
40      10      15131  0.000000       0.001000       0.001000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
40      10      15132  0.000000       0.001000       0.001000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
40      10      15221  0.000000       0.001000       0.001000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
40      10      15222  0.000000       0.001000       0.001000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
40      10      15231  0.000000       0.001000       0.001000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
40      10      15232  0.000000       0.001000       0.001000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
40      10      15321  0.000000       0.001000       0.001000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
40      10      15322  0.000000       0.001000       0.001000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
40      10      15331  0.000000       0.001000       0.001000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
40      10      15332  0.000000       0.001000       0.001000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
40      10      15421  0.000000       0.001000       0.001000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
```

```
40      10      15422   0.000000        0.001000        0.001000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      10      15431   0.000000        0.001000        0.001000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      10      15432   0.000000        0.001000        0.001000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      10      16000   0.000000        0.000000        0.000000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      11      1000    0.000000        1.750000        1.750000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      11      2000    0.000000        1.500000        1.500000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      11      3000    0.000000        1.200000        1.200000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      11      4000    0.000000        1.500000        1.500000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      11      5000    0.000000        0.750000        0.750000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      11      6000    0.000000        2.000000        2.000000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      11      7000    0.000000        2.500000        2.500000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      11      8000    0.000000        1.125000        1.125000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      11      9000    0.000000        0.375000        0.375000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      11      10000   0.000000        0.000000        0.000000        0.000000        0.000000
0.000001        1.640000        25.000000       0.000000        0.000000        0.000000        0.000000
40      11      11111   0.000000        0.500000        0.500000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      11      11112   0.000000        0.500000        0.500000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      11      11121   0.000000        0.500000        0.500000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      11      11122   0.000000        0.500000        0.500000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      11      11211   0.000000        0.500000        0.500000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      11      11212   0.000000        0.500000        0.500000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      11      11221   0.000000        0.500000        0.500000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      11      11222   0.000000        0.500000        0.500000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      11      11311   0.000000        0.500000        0.500000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      11      11312   0.000000        0.500000        0.500000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      11      11321   0.000000        0.500000        0.500000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      11      11322   0.000000        0.500000        0.500000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      11      11411   0.000000        0.500000        0.500000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      11      11412   0.000000        0.500000        0.500000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      11      11421   0.000000        0.500000        0.500000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      11      11422   0.000000        0.500000        0.500000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      11      12111   0.000000        0.500000        0.030000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      11      12112   0.000000        0.500000        0.030000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      11      12121   0.000000        0.500000        0.030000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      11      12122   0.000000        0.500000        0.030000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      11      12211   0.000000        0.500000        0.030000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      11      12212   0.000000        0.500000        0.030000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      11      12221   0.000000        0.500000        0.030000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      11      12222   0.000000        0.500000        0.030000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      11      12311   0.000000        0.500000        0.030000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
```

```
40      11      12312   0.000000        0.500000        0.030000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      11      12321   0.000000        0.500000        0.030000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      11      12322   0.000000        0.500000        0.030000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      11      12411   0.000000        0.500000        0.030000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      11      12412   0.000000        0.500000        0.030000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      11      12421   0.000000        0.500000        0.030000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      11      12422   0.000000        0.500000        0.030000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      11      13111   0.000000        0.100000        0.100000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      11      13112   0.000000        0.100000        0.100000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      11      13121   0.000000        0.100000        0.100000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      11      13122   0.000000        0.100000        0.100000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      11      13211   0.000000        0.100000        0.100000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      11      13212   0.000000        0.100000        0.100000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      11      13221   0.000000        0.100000        0.100000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      11      13222   0.000000        0.100000        0.100000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      11      13231   0.000000        0.100000        0.100000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      11      13232   0.000000        0.100000        0.100000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      11      13311   0.000000        0.100000        0.100000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      11      13312   0.000000        0.100000        0.100000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      11      13321   0.000000        0.100000        0.100000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      11      13322   0.000000        0.100000        0.100000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      11      13331   0.000000        0.100000        0.100000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      11      13411   0.000000        0.100000        0.100000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      11      13412   0.000000        0.100000        0.100000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      11      13421   0.000000        0.100000        0.100000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      11      13422   0.000000        0.100000        0.100000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      11      13431   0.000000        0.100000        0.100000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      11      13432   0.000000        0.100000        0.100000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      11      14121   0.000000        0.100000        0.100000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      11      14122   0.000000        0.100000        0.100000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      11      14131   0.000000        0.100000        0.100000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      11      14132   0.000000        0.100000        0.100000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      11      14221   0.000000        0.100000        0.100000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      11      14222   0.000000        0.100000        0.100000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      11      14231   0.000000        0.100000        0.100000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      11      14232   0.000000        0.100000        0.100000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      11      14321   0.000000        0.100000        0.100000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      11      14322   0.000000        0.100000        0.100000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      11      14331   0.000000        0.100000        0.100000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
```

```
40      11      14332   0.000000        0.100000        0.100000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      11      14421   0.000000        0.100000        0.100000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      11      14422   0.000000        0.100000        0.100000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      11      14431   0.000000        0.100000        0.100000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      11      14432   0.000000        0.100000        0.100000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      11      15121   0.000000        0.100000        0.100000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      11      15122   0.000000        0.100000        0.100000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      11      15131   0.000000        0.100000        0.100000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      11      15132   0.000000        0.100000        0.100000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      11      15221   0.000000        0.100000        0.100000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      11      15222   0.000000        0.100000        0.100000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      11      15231   0.000000        0.100000        0.100000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      11      15232   0.000000        0.100000        0.100000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      11      15321   0.000000        0.100000        0.100000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      11      15322   0.000000        0.100000        0.100000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      11      15331   0.000000        0.100000        0.100000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      11      15332   0.000000        0.100000        0.100000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      11      15421   0.000000        0.100000        0.100000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      11      15422   0.000000        0.100000        0.100000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      11      15431   0.000000        0.100000        0.100000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      11      15432   0.000000        0.100000        0.100000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      11      16000   0.000000        0.000000        0.000000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      12      1000    0.000000        0.432000        0.432000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      12      2000    0.000000        0.324000        0.324000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      12      3000    0.000000        0.108000        0.108000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      12      4000    0.000000        0.432000        0.432000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      12      5000    0.000000        0.378000        0.378000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      12      6000    0.000000        0.518400        0.518400        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      12      7000    0.000000        0.691200        0.691200        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      12      8000    0.000000        0.270000        0.270000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      12      9000    0.000000        0.090000        0.090000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      12      10000   0.000000        0.000000        0.000000        0.000000        0.000000
0.000001        1.640000        4.000000        0.000000        0.000000        0.000000        0.000000
40      12      11111   0.000000        0.010000        0.010000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      12      11112   0.000000        0.010000        0.010000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      12      11121   0.000000        0.010000        0.010000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      12      11122   0.000000        0.010000        0.010000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      12      11211   0.000000        0.010000        0.010000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      12      11212   0.000000        0.010000        0.010000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      12      11221   0.000000        0.010000        0.010000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
```

```
40      12      11222   0.000000        0.010000        0.010000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      12      11311   0.000000        0.010000        0.010000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      12      11312   0.000000        0.010000        0.010000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      12      11321   0.000000        0.010000        0.010000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      12      11322   0.000000        0.010000        0.010000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      12      11411   0.000000        0.010000        0.010000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      12      11412   0.000000        0.010000        0.010000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      12      11421   0.000000        0.010000        0.010000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      12      11422   0.000000        0.010000        0.010000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      12      12111   0.000000        0.010000        0.010000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      12      12112   0.000000        0.010000        0.010000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      12      12121   0.000000        0.010000        0.010000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      12      12122   0.000000        0.010000        0.010000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      12      12211   0.000000        0.010000        0.010000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      12      12212   0.000000        0.010000        0.010000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      12      12221   0.000000        0.010000        0.010000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      12      12222   0.000000        0.010000        0.010000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      12      12311   0.000000        0.010000        0.010000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      12      12312   0.000000        0.010000        0.010000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      12      12321   0.000000        0.010000        0.010000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      12      12322   0.000000        0.010000        0.010000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      12      12411   0.000000        0.010000        0.010000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      12      12412   0.000000        0.010000        0.010000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      12      12421   0.000000        0.010000        0.010000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      12      12422   0.000000        0.010000        0.010000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      12      13111   0.000000        0.010000        0.010000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      12      13112   0.000000        0.010000        0.010000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      12      13121   0.000000        0.010000        0.010000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      12      13122   0.000000        0.010000        0.010000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      12      13211   0.000000        0.010000        0.010000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      12      13212   0.000000        0.010000        0.010000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      12      13221   0.000000        0.010000        0.010000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      12      13222   0.000000        0.010000        0.010000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      12      13231   0.000000        0.010000        0.010000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      12      13232   0.000000        0.010000        0.010000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      12      13311   0.000000        0.010000        0.010000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      12      13312   0.000000        0.010000        0.010000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      12      13321   0.000000        0.010000        0.010000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      12      13322   0.000000        0.010000        0.010000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
```

```
40      12     13331   0.000000       0.010000       0.010000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
40      12     13411   0.000000       0.010000       0.010000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
40      12     13412   0.000000       0.010000       0.010000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
40      12     13421   0.000000       0.010000       0.010000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
40      12     13422   0.000000       0.010000       0.010000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
40      12     13431   0.000000       0.010000       0.010000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
40      12     13432   0.000000       0.010000       0.010000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
40      12     14121   0.000000       0.010000       0.010000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
40      12     14122   0.000000       0.010000       0.010000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
40      12     14131   0.000000       0.010000       0.010000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
40      12     14132   0.000000       0.010000       0.010000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
40      12     14221   0.000000       0.010000       0.010000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
40      12     14222   0.000000       0.010000       0.010000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
40      12     14231   0.000000       0.010000       0.010000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
40      12     14232   0.000000       0.010000       0.010000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
40      12     14321   0.000000       0.010000       0.010000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
40      12     14322   0.000000       0.010000       0.010000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
40      12     14331   0.000000       0.010000       0.010000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
40      12     14332   0.000000       0.010000       0.010000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
40      12     14421   0.000000       0.010000       0.010000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
40      12     14422   0.000000       0.010000       0.010000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
40      12     14431   0.000000       0.010000       0.010000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
40      12     14432   0.000000       0.010000       0.010000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
40      12     15121   0.000000       0.010000       0.010000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
40      12     15122   0.000000       0.010000       0.010000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
40      12     15131   0.000000       0.010000       0.010000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
40      12     15132   0.000000       0.010000       0.010000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
40      12     15221   0.000000       0.010000       0.010000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
40      12     15222   0.000000       0.010000       0.010000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
40      12     15231   0.000000       0.010000       0.010000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
40      12     15232   0.000000       0.010000       0.010000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
40      12     15321   0.000000       0.010000       0.010000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
40      12     15322   0.000000       0.010000       0.010000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
40      12     15331   0.000000       0.010000       0.010000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
40      12     15332   0.000000       0.010000       0.010000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
40      12     15421   0.000000       0.010000       0.010000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
40      12     15422   0.000000       0.010000       0.010000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
40      12     15431   0.000000       0.010000       0.010000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
40      12     15432   0.000000       0.010000       0.010000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
```

```
40      12      16000   0.000000        0.000000        0.000000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      14      1000    0.000000        13.824000       13.824000       0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      14      2000    0.000000        6.912000        6.912000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      14      3000    0.000000        5.184000        5.184000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      14      4000    0.000000        4.500000        4.500000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      14      5000    0.000000        2.700000        2.700000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      14      6000    0.000000        5.760000        5.760000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      14      7000    0.000000        11.520000       11.520000       0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      14      8000    0.000000        4.320000        4.320000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      14      9000    0.000000        5.400000        5.400000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      14      10000   0.000000        0.000000        0.000000        0.000000        0.000000
0.000001        1.640000        80.000000       0.000000        0.000000        0.000000        0.000000
40      14      11111   0.000000        3.600000        3.600000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        50.000000       0.000000        0.000000
40      14      11112   0.000000        3.600000        3.600000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        50.000000       0.000000        0.000000
40      14      11121   0.000000        3.600000        3.600000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        50.000000       0.000000        0.000000
40      14      11122   0.000000        3.600000        3.600000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        50.000000       0.000000        0.000000
40      14      11211   0.000000        3.600000        3.600000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        50.000000       0.000000        0.000000
40      14      11212   0.000000        3.600000        3.600000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        50.000000       0.000000        0.000000
40      14      11221   0.000000        3.600000        3.600000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        50.000000       0.000000        0.000000
40      14      11222   0.000000        3.600000        3.600000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        50.000000       0.000000        0.000000
40      14      11311   0.000000        3.600000        3.600000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        50.000000       0.000000        0.000000
40      14      11312   0.000000        3.600000        3.600000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        50.000000       0.000000        0.000000
40      14      11321   0.000000        3.600000        3.600000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        50.000000       0.000000        0.000000
40      14      11322   0.000000        3.600000        3.600000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        50.000000       0.000000        0.000000
40      14      11411   0.000000        3.600000        3.600000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        50.000000       0.000000        0.000000
40      14      11412   0.000000        3.600000        3.600000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        50.000000       0.000000        0.000000
40      14      11421   0.000000        3.600000        3.600000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        50.000000       0.000000        0.000000
40      14      11422   0.000000        3.600000        3.600000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        50.000000       0.000000        0.000000
40      14      12111   0.000000        3.600000        3.600000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        50.000000       0.000000        0.000000
40      14      12112   0.000000        3.600000        3.600000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        50.000000       0.000000        0.000000
40      14      12121   0.000000        3.600000        3.600000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        50.000000       0.000000        0.000000
40      14      12122   0.000000        3.600000        3.600000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        50.000000       0.000000        0.000000
40      14      12211   0.000000        3.600000        3.600000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        50.000000       0.000000        0.000000
40      14      12212   0.000000        3.600000        3.600000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        50.000000       0.000000        0.000000
40      14      12221   0.000000        3.600000        3.600000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        50.000000       0.000000        0.000000
40      14      12222   0.000000        3.600000        3.600000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        50.000000       0.000000        0.000000
40      14      12311   0.000000        3.600000        3.600000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        50.000000       0.000000        0.000000
40      14      12312   0.000000        3.600000        3.600000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        50.000000       0.000000        0.000000
40      14      12321   0.000000        3.600000        3.600000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        50.000000       0.000000        0.000000
40      14      12322   0.000000        3.600000        3.600000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        50.000000       0.000000        0.000000
```

```
40      14     12411  0.000000       3.600000       3.600000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       50.000000      0.000000       0.000000
40      14     12412  0.000000       3.600000       3.600000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       50.000000      0.000000       0.000000
40      14     12421  0.000000       3.600000       3.600000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       50.000000      0.000000       0.000000
40      14     12422  0.000000       3.600000       3.600000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       50.000000      0.000000       0.000000
40      14     13111  0.000000       0.720000       0.720000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       50.000000      0.000000       0.000000
40      14     13112  0.000000       0.720000       0.720000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       50.000000      0.000000       0.000000
40      14     13121  0.000000       0.720000       0.720000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       50.000000      0.000000       0.000000
40      14     13122  0.000000       0.720000       0.720000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       50.000000      0.000000       0.000000
40      14     13211  0.000000       0.720000       0.720000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       50.000000      0.000000       0.000000
40      14     13212  0.000000       0.720000       0.720000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       50.000000      0.000000       0.000000
40      14     13221  0.000000       0.720000       0.720000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       50.000000      0.000000       0.000000
40      14     13222  0.000000       0.720000       0.720000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       50.000000      0.000000       0.000000
40      14     13231  0.000000       0.720000       0.720000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       50.000000      0.000000       0.000000
40      14     13232  0.000000       0.720000       0.720000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       50.000000      0.000000       0.000000
40      14     13311  0.000000       0.720000       0.720000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       50.000000      0.000000       0.000000
40      14     13312  0.000000       0.720000       0.720000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       50.000000      0.000000       0.000000
40      14     13321  0.000000       0.720000       0.720000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       50.000000      0.000000       0.000000
40      14     13322  0.000000       0.720000       0.720000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       50.000000      0.000000       0.000000
40      14     13331  0.000000       0.720000       0.720000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       50.000000      0.000000       0.000000
40      14     13411  0.000000       0.720000       0.720000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       50.000000      0.000000       0.000000
40      14     13412  0.000000       0.720000       0.720000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       50.000000      0.000000       0.000000
40      14     13421  0.000000       0.720000       0.720000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       50.000000      0.000000       0.000000
40      14     13422  0.000000       0.720000       0.720000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       50.000000      0.000000       0.000000
40      14     13431  0.000000       0.720000       0.720000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       50.000000      0.000000       0.000000
40      14     13432  0.000000       0.720000       0.720000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       50.000000      0.000000       0.000000
40      14     14121  0.000000       0.720000       0.720000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       50.000000      0.000000       0.000000
40      14     14122  0.000000       0.720000       0.720000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       50.000000      0.000000       0.000000
40      14     14131  0.000000       0.720000       0.720000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       50.000000      0.000000       0.000000
40      14     14132  0.000000       0.720000       0.720000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       50.000000      0.000000       0.000000
40      14     14221  0.000000       0.720000       0.720000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       50.000000      0.000000       0.000000
40      14     14222  0.000000       0.720000       0.720000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       50.000000      0.000000       0.000000
40      14     14231  0.000000       0.720000       0.720000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       50.000000      0.000000       0.000000
40      14     14232  0.000000       0.720000       0.720000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       50.000000      0.000000       0.000000
40      14     14321  0.000000       0.720000       0.720000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       50.000000      0.000000       0.000000
40      14     14322  0.000000       0.720000       0.720000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       50.000000      0.000000       0.000000
40      14     14331  0.000000       0.720000       0.720000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       50.000000      0.000000       0.000000
40      14     14332  0.000000       0.720000       0.720000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       50.000000      0.000000       0.000000
40      14     14421  0.000000       0.720000       0.720000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       50.000000      0.000000       0.000000
40      14     14422  0.000000       0.720000       0.720000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       50.000000      0.000000       0.000000
```

```
        40      14      14431   0.000000        0.720000        0.720000        0.000000        0.000000
        0.000001        1.640000        0.000000        0.000000        50.000000       0.000000        0.000000
        40      14      14432   0.000000        0.720000        0.720000        0.000000        0.000000
        0.000001        1.640000        0.000000        0.000000        50.000000       0.000000        0.000000
        40      14      15121   0.000000        0.720000        0.720000        0.000000        0.000000
        0.000001        1.640000        0.000000        0.000000        50.000000       0.000000        0.000000
        40      14      15122   0.000000        0.720000        0.720000        0.000000        0.000000
        0.000001        1.640000        0.000000        0.000000        50.000000       0.000000        0.000000
        40      14      15131   0.000000        0.720000        0.720000        0.000000        0.000000
        0.000001        1.640000        0.000000        0.000000        50.000000       0.000000        0.000000
        40      14      15132   0.000000        0.720000        0.720000        0.000000        0.000000
        0.000001        1.640000        0.000000        0.000000        50.000000       0.000000        0.000000
        40      14      15221   0.000000        0.720000        0.720000        0.000000        0.000000
        0.000001        1.640000        0.000000        0.000000        50.000000       0.000000        0.000000
        40      14      15222   0.000000        0.720000        0.720000        0.000000        0.000000
        0.000001        1.640000        0.000000        0.000000        50.000000       0.000000        0.000000
        40      14      15231   0.000000        0.720000        0.720000        0.000000        0.000000
        0.000001        1.640000        0.000000        0.000000        50.000000       0.000000        0.000000
        40      14      15232   0.000000        0.720000        0.720000        0.000000        0.000000
        0.000001        1.640000        0.000000        0.000000        50.000000       0.000000        0.000000
        40      14      15321   0.000000        0.720000        0.720000        0.000000        0.000000
        0.000001        1.640000        0.000000        0.000000        50.000000       0.000000        0.000000
        40      14      15322   0.000000        0.720000        0.720000        0.000000        0.000000
        0.000001        1.640000        0.000000        0.000000        50.000000       0.000000        0.000000
        40      14      15331   0.000000        0.720000        0.720000        0.000000        0.000000
        0.000001        1.640000        0.000000        0.000000        50.000000       0.000000        0.000000
        40      14      15332   0.000000        0.720000        0.720000        0.000000        0.000000
        0.000001        1.640000        0.000000        0.000000        50.000000       0.000000        0.000000
        40      14      15421   0.000000        0.720000        0.720000        0.000000        0.000000
        0.000001        1.640000        0.000000        0.000000        50.000000       0.000000        0.000000
        40      14      15422   0.000000        0.720000        0.720000        0.000000        0.000000
        0.000001        1.640000        0.000000        0.000000        50.000000       0.000000        0.000000
        40      14      15431   0.000000        0.720000        0.720000        0.000000        0.000000
        0.000001        1.640000        0.000000        0.000000        50.000000       0.000000        0.000000
        40      14      15432   0.000000        0.720000        0.720000        0.000000        0.000000
        0.000001        1.640000        0.000000        0.000000        50.000000       0.000000        0.000000
        40      14      16000   0.000000        0.000000        0.000000        0.000000        0.000000
        0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
c-------------------------------------------------------------------------------------------
c270 mon-accumulation rate (monaccum)
c    only required if vqofg =1 (see card 255)
c
c    defid   parameter group id
c    dwqid   general quality id
c    deluid  landuse id
c    jan-dec accumulation rate at start of each month (lb/acre/day)
c if in card 250, the unit is #/100ml, the above unit should be #/acre/day
c
c defid dwqid   deluid   jan   feb   mar   apr   may   jun   jul   aug   sep   oct   nov   dec
c--------------------------------------------------------------------------------------
c271 mon-storage limit of quality constituent (monsqolim)
c    only required if vqofg = 1 (see card 255)
c
c    defid   parameter group id
c    dwqid   general quality id
c    deluid  landuse id
c    jan-dec maximum storage at start of each month (lb/acre)
c if in card 250, the unit is #/100ml, the above unit should be #/acre
c
c defid dwqid   deluid   jan   feb   mar   apr   may   jun   jul   aug   sep   oct   nov   dec
c--------------------------------------------------------------------------------------
c272 mon-surfaceflow concentration (monsuroconc)
c    only required if vsqcfg = 1 (see card 255)
c
c    defid   parameter group id
c    dwqid   general quality id
c    deluid  landuse id
c    jan-dec concentration of constituent in surface flow at start of each month (mg/l), (ug/l), or (#/100ml)
c if in card 250, the unit is #/100ml, the above unit should be #/100ml
c
c defid dwqid   deluid   jan   feb   mar   apr   may   jun   jul   aug   sep   oct   nov   dec
c--------------------------------------------------------------------------------------
c273 mon-interflow concentration (moninterconc)
c    only required if viqcfg = 1 (see card 255)
c
c    defid   parameter group id
c    dwqid   general quality id
c    deluid  landuse id
c    jan-dec concentration of constituent in interflow at start of each month (mg/l), (ug/l), or (#/100ml)
```

```
c if in card 250, the unit is #/100ml, the above unit should be #/100ml
c
c defid dwqid   deluid   jan   feb   mar   apr   may   jun   jul   aug   sep   oct   nov   dec
c-------------------------------------------------------------------------------------
c274 mon-groundwater concentration (mongrndconc)
c    only required if vaqcfg = 1 (see card 255)
c
c    defid   parameter group id
c    dwqid   general quality id
c    deluid  landuse id
c    jan-dec concentration of constituent in groundwater at start of each month (mg/l), (ug/l), or (#/100ml)
c if in card 250, the unit is #/100ml, the above unit should be #/100ml
c
c defid dwqid   deluid   jan   feb   mar   apr   may   jun   jul   aug   sep   oct   nov   dec
c------------------------------------------------------------------------------------------
c275 mon-atmospheric dry deposition flux
c    only required if maddfglnd = 1 (see card 255)
c
c    defid   parameter group id
c    dwqid   general quality id
c    deluid  landuse id
c    jan-dec flux of constituent in dry deposition at start of each month (lb/acre/day or #/acre/day)
c
c defid dwqid   deluid   jan   feb   mar   apr   may   jun   jul   aug   sep   oct   nov   dec
c------------------------------------------------------------------------------------------
c276 mon-atmospheric wet deposition concentration
c    only required if mawdfglnd = 1 (see card 255)
c
c    defid   parameter group id
c    dwqid   general quality id
c    deluid  landuse id
c    jan-dec concentration of constituent in atmospheric wet deposition at start of each month (mg/l), (ug/l),
or (#/100ml)
c
c defid dwqid   deluid   jan   feb   mar   apr   may   jun   jul   aug   sep   oct   nov   dec
c------------------------------------------------------------------------------------------
C280 stream water quality control
c
c    adfgrch     if = 1 atmosperic deposition on reach (0 for no atmospheric deposition)
c    maddfgrch   if = 1 atmosperic dry deposition varies monthly on reach (card 282)
c    mawdfgrch   if = 1 atmosperic wet deposition varies monthly on reach (card 283)
c
c adfgrch  maddfgrch  mawdfgrch
       0      0      0
c-------------------------------------------------------------------------------------------------------------
c281 general quality constituent control
c
c    rgid     stream parameter group id
c    dwqid    general quality id
c    qsdfg    if = 0 no sediment associated qual
c       if = 1 sediment associated in stream, adsorption/desorption of qual is simulated
c    iniCond  initial instream concentration at start of simulation by group (mg/l), (ug/l), or (#/100ml)
c    decay    general first-order instream loss rate of qual by reach group (1/day)
c    tcdecay  temperature correction coefficient for first-order decay of qual (min=1, max=2)
c    addc     atmospheric dry deposition flux (lb/acre/day or #/acre/day)
c    awdc     atmospheric wet deposition concentration (mg/l), (ug/l), or (#/100ml)
c    potber   scour potency pactor for stream bank erosion (lb or #)/ton-sediment
c
c rgid  dwqid   qsdfg   iniCond  decay  tcdecay   addc   awdc   potber
       33     3      0      0.000000       0.300000       1.000000       0.000000       0.000000
       0.000000
       33     7      0      0.000000       0.100000       1.000000       0.000000       0.000000
       0.000000
       33     10     0      0.000000       0.100000       1.000000       0.000000       0.000000
       0.000000
       33     11     0      0.000000       0.100000       1.000000       0.000000       0.000000
       0.000000
       33     12     0      0.000000       0.100000       1.000000       0.000000       0.000000
       0.000000
       33     14     0      0.000000       0.100000       1.000000       0.000000       0.000000
       0.000000
       40     3      0      0.000000       0.100000       1.000000       0.000000       0.000000
       0.000000
       40     7      0      0.000000       0.100000       1.000000       0.000000       0.000000
       0.000000
       40     10     0      0.000000       0.100000       1.000000       0.000000       0.000000
       0.000000
       40     11     0      0.000000       0.100000       1.000000       0.000000       0.000000
       0.000000
```

```
        40     12     0      0.000000       0.100000       1.000000       0.000000       0.000000
        0.000000
        40     14     0      0.000000       0.100000       1.000000       0.000000       0.000000
        0.000000
c------------------------------------------------------------------------------------------------------------
c282 mon-atmospheric dry deposition flux
c    only required if maddfgrch = 1 (see card 280)
c
c    rgid    reach group id
c    dwqid   general quality id
c    jan-dec flux of constituent in dry deposition at start of each month (lb/acre/day or #/acre/day)
c
c rgid dwqid   jan   feb   mar   apr   may   jun   jul   aug   sep   oct   nov   dec
c---------------------------------------------------------------------------------------------
c283 mon-atmospheric wet deposition concentration
c    only required if mawdfgrch = 1 (see card 280)
c
c    rgid    reach group id
c    dwqid   general quality id
c    jan-dec concentration of constituent in atmospheric wet deposition at start of each month (mg/l), (ug/l),
or (#/100ml)
c
c rgid dwqid   jan   feb   mar   apr   may   jun   jul   aug   sep   oct   nov   dec
c---------------------------------------------------------------------------------------------
c285 parameters for decay of contaminant adsorbed to sediment
c    only required if qsdfg > 0 (see card 281)
c
c    rgid      reach group id
c    dwqid     general quality id
c    addcpm1   decay rate for qual adsorbed to suspended sediment (/day)
c    addcpm2   temperature correction coefficient for decay of qual on suspended sediment (range from 1.0 to
2.0)
c    addcpm3   decay rate for qual adsorbed to bed sediment (/day)
c    addcpm4   temperature correction coefficient for decay of qual on bed sediment (range from 1.0 to 2.0)
c
c   rgid  dwqid   addcpm1   addcpm2   addcpm3   addcpm4
        33     3       0.000000       1.000000       0.000000       1.000000
        33     7       0.000000       1.000000       0.000000       1.000000
        33     10      0.000000       1.000000       0.000000       1.000000
        33     11      0.000000       1.000000       0.000000       1.000000
        33     12      0.000000       1.000000       0.000000       1.000000
        33     14      0.000000       1.000000       0.000000       1.000000
        40     3       0.000000       1.000000       0.000000       1.000000
        40     7       0.000000       1.000000       0.000000       1.000000
        40     10      0.000000       1.000000       0.000000       1.000000
        40     11      0.000000       1.000000       0.000000       1.000000
        40     12      0.000000       1.000000       0.000000       1.000000
        40     14      0.000000       1.000000       0.000000       1.000000
c---------------------------------------------------------------------------------------------
c286 adsorption coefficients of qual
c    only required if qsdfg > 0 (see card 281)
c
c    rgid      reach group id
c    dwqid     general quality id
c    adpm1     distribution coefficients for qual with suspended sand (l/mg)
c    adpm2     distribution coefficients for qual with suspended silt (l/mg)
c    adpm3     distribution coefficients for qual with suspended clay (l/mg)
c    adpm4     distribution coefficients for qual with bed sand (l/mg)
c    adpm5     distribution coefficients for qual with bed silt (l/mg)
c    adpm6     distribution coefficients for qual with bed clay (l/mg)
c
c   rgid  dwqid   adpm1   adpm2   adpm3   adpm4   adpm5   adpm6
        33     3       1.000e-10      1.000e-10      1.000e-10      1.000e-10      1.000e-10      1.000e-10
        33     7       1.000e-10      1.000e-10      1.000e-10      1.000e-10      1.000e-10      1.000e-10
        33     10      1.000e-10      1.000e-10      1.000e-10      1.000e-10      1.000e-10      1.000e-10
        33     11      1.000e-10      1.000e-10      1.000e-10      1.000e-10      1.000e-10      1.000e-10
        33     12      1.000e-10      1.000e-10      1.000e-10      1.000e-10      1.000e-10      1.000e-10
        33     14      1.000e-10      1.000e-10      1.000e-10      1.000e-10      1.000e-10      1.000e-10
        40     3       1.000e-10      1.000e-10      1.000e-10      1.000e-10      1.000e-10      1.000e-10
        40     7       1.000e-10      1.000e-10      1.000e-10      1.000e-10      1.000e-10      1.000e-10
        40     10      1.000e-10      1.000e-10      1.000e-10      1.000e-10      1.000e-10      1.000e-10
        40     11      1.000e-10      1.000e-10      1.000e-10      1.000e-10      1.000e-10      1.000e-10
        40     12      1.000e-10      1.000e-10      1.000e-10      1.000e-10      1.000e-10      1.000e-10
        40     14      1.000e-10      1.000e-10      1.000e-10      1.000e-10      1.000e-10      1.000e-10
c---------------------------------------------------------------------------------------------
c287 adsorption/desorption rate parameters
c    only required if qsdfg > 0 (see card 281)
c
c    rgid      reach group id
```

```
c    dwqid     general quality id
c    adpm1     transfer rates between adsorbed and desorbed states of qual with suspended sand (/day)
c    adpm2     transfer rates between adsorbed and desorbed states of qual with suspended silt (/day)
c    adpm3     transfer rates between adsorbed and desorbed states of qual with suspended clay (/day)
c    adpm4     transfer rates between adsorbed and desorbed states of qual with bed sand (/day)
c    adpm5     transfer rates between adsorbed and desorbed states of qual with bed silt (/day)
c    adpm6     transfer rates between adsorbed and desorbed states of qual with bed clay (/day)
c
c   rgid  dwqid   adpm1   adpm2   adpm3   adpm4   adpm5   adpm6
       33     3      0.000010       0.000010       0.000010       0.000010       0.000010       0.000010
       33     7      0.000010       0.000010       0.000010       0.000010       0.000010       0.000010
       33     10     0.000010       0.000010       0.000010       0.000010       0.000010       0.000010
       33     11     0.000010       0.000010       0.000010       0.000010       0.000010       0.000010
       33     12     0.000010       0.000010       0.000010       0.000010       0.000010       0.000010
       33     14     0.000010       0.000010       0.000010       0.000010       0.000010       0.000010
       40     3      0.000010       0.000010       0.000010       0.000010       0.000010       0.000010
       40     7      0.000010       0.000010       0.000010       0.000010       0.000010       0.000010
       40     10     0.000010       0.000010       0.000010       0.000010       0.000010       0.000010
       40     11     0.000010       0.000010       0.000010       0.000010       0.000010       0.000010
       40     12     0.000010       0.000010       0.000010       0.000010       0.000010       0.000010
       40     14     0.000010       0.000010       0.000010       0.000010       0.000010       0.000010
c--------------------------------------------------------------------------------------------
c288 adsorption/desorption temperature correction parameters
c    only required if qsdfg > 0 (see card 281)
c
c    rgid      reach group id
c    dwqid     general quality id
c    adpm1     temperature correction coefficients for adsorption/desorption on suspended sand (range from 1.0
to 2.0)
c    adpm2     temperature correction coefficients for adsorption/desorption on suspended silt (range from 1.0
to 2.0)
c    adpm3     temperature correction coefficients for adsorption/desorption on suspended clay (range from 1.0
to 2.0)
c    adpm4     temperature correction coefficients for adsorption/desorption on bed sand (range from 1.0 to 2.0)
c    adpm5     temperature correction coefficients for adsorption/desorption on bed silt (range from 1.0 to 2.0)
c    adpm6     temperature correction coefficients for adsorption/desorption on bed clay (range from 1.0 to 2.0)
c
c   rgid  dwqid   adpm1   adpm2   adpm3   adpm4   adpm5   adpm6
       33     3      1.000000       1.000000       1.000000       1.000000       1.000000       1.000000
       33     7      1.000000       1.000000       1.000000       1.000000       1.000000       1.000000
       33     10     1.000000       1.000000       1.000000       1.000000       1.000000       1.000000
       33     11     1.000000       1.000000       1.000000       1.000000       1.000000       1.000000
       33     12     1.000000       1.000000       1.000000       1.000000       1.000000       1.000000
       33     14     1.000000       1.000000       1.000000       1.000000       1.000000       1.000000
       40     3      1.000000       1.000000       1.000000       1.000000       1.000000       1.000000
       40     7      1.000000       1.000000       1.000000       1.000000       1.000000       1.000000
       40     10     1.000000       1.000000       1.000000       1.000000       1.000000       1.000000
       40     11     1.000000       1.000000       1.000000       1.000000       1.000000       1.000000
       40     12     1.000000       1.000000       1.000000       1.000000       1.000000       1.000000
       40     14     1.000000       1.000000       1.000000       1.000000       1.000000       1.000000
c--------------------------------------------------------------------------------------------
c289 initial concentrations on sediment
c    only required if qsdfg > 0 (see card 281)
c
c    rgid      reach group id
c    dwqid     general quality id
c    sqal1     initial concentrations of qual on suspended sand (concu/mg)
c    sqal2     initial concentrations of qual on suspended silt (concu/mg)
c    sqal3     initial concentrations of qual on suspended clay (concu/mg)
c    sqal4     initial concentrations of qual on bed sand (concu/mg)
c    sqal5     initial concentrations of qual on bed silt (concu/mg)
c    sqal6     initial concentrations of qual on bed clay (concu/mg)
c
c   rgid  dwqid   sqal1   sqal2   sqal3   sqal4   sqal5   sqal6
       33     3      0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
       33     7      0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
       33     10     0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
       33     11     0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
       33     12     0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
       33     14     0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
       40     3      0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
       40     7      0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
       40     10     0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
       40     11     0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
       40     12     0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
       40     14     0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
c--------------------------------------------------------------------------------------------
c400 general channel information
c
```

```
c    admod   advection method (1 for dynamic mixing same as in HSPF and 2 for static mixing)
c    kc      crop factor associated with PEVT (used to back-calculate EVAP; EVAP = PEVT/kc)
c    sedber  stream bank erosion sediment (1 for on and 0 for off) (if sedfg=1)
c    vconfg  a value of 1 for vconfg means that F(vol) (volume-dependent) outflow demand components are
multiplied by a factor which is allowed to vary through the year.
c            These monthly adjustment factors are input in Table-type MON-CONVF in this section (card 401)
c
c admod    kc   sedber   vconfg
       1       8.500000000000e-01     0       0
c---------------------------------------------------------------------------------------------
c401 monthly F(vol) adjustment factors
c    only required if vconfg = 1 (see card 400)
c
c    rgid     stream parameter group id
c    jan-dec  F(vol) adjustment factors at the start of each month
c
c  rgid jan   feb   mar   apr   may   jun   jul   aug   sep   oct   nov   dec
c---------------------------------------------------------------------------------------------
c405 channel routing network
c
c    rchid   reach id (same as subbasin id)
c    control output control switch for the corresponding reach
c            0 = will not write general output
c            1 = will write general output
c    NumOutlets number of downstream outlets
c    DSn     downstream outlets  DS1   Ds2  ....  DSn
c
c    rchid   control   NumOutlets   DS1   DS2  .......   DSn
       6665    1       1      0
       6671    1       1      0
       6673    1       1      0
       6674    1       1      0
       6675    1       1      0
       6684    1       1      0
       6839    1       1      0
       6844    1       1      0
       6850    1       1      0
       6856    1       1      0
       6859    1       1      0
       6861    1       1      0
c---------------------------------------------------------------------------------------------
c407  reach weather multiplier
c
c    rchid      reach id (same as subbasin id)
c    premult    multiplier for precipitation
c    petmult    multiplier for potential evapotranspiration
c
c rchid  premult  petmult
       6665    1.000000       1.000000
       6671    1.000000       1.000000
       6673    1.000000       1.000000
       6674    1.000000       1.000000
       6675    1.000000       1.000000
       6684    1.000000       1.000000
       6839    1.000000       1.000000
       6844    1.000000       1.000000
       6850    1.000000       1.000000
       6856    1.000000       1.000000
       6859    1.000000       1.000000
       6861    1.000000       1.000000
c------------------------------------------------------------------------------------------
c410 reach geometry information
c
c    rchid   reach/lake id (same as subbasin id)
c    rgid    reach/lake group id
c    trgid   threshold reach/lake group id
c    lkfg    reach/lake flag (0 for reach otherwise lake)
c            lake flag = 1 (rectangular weir for internal option)
c            lake flag = 2 (triangular weir for internal option)
c            lake flag = 11 (BMP with rectangular weir for internal option)
c            lake flag = 12 (BMP with triangular weir for internal option)
c    idepth  reach/lake initial water depth (feet)
c    length  reach/lake length (miles)
c    depth   reach/lake bank full depth (feet)
c    width   reach/lake bankfull width (feet)
c    slope   reach longitudinal slope
c    mann    reach Manning's roughness coefficient/lake weir width (ft)
c    r1      reach ratio of bottom width to bank full width (bottom width = r1 * width)/lake orifice height (ft)
c    r2      reach side slope of flood plane/lake orifice diameter (ft)
```

```
c    w1      reach flood plane width factor (total width of flood plane = w1*Width)/lake median particle size
diameter, db50 (ft)
c    crat    ratio of maximum velocity to mean velocity in the RCHRES cross-section under typical flow
conditions (greater than or equal to 1)
c    ks      weighting factor for hydraulic routing (calibration)
c    qloss   constant flow loss rate (e.g., infiltration, pumping [in / hr])
c    qloss_t flow loss target reach ID
c    qloss_f flow loss water quality flag for target reach ID (0 - use the target reach instream concentration;
1 - use the source reach instream concentration)
c
c rchid rgid  trgid   lkfg idepth length    depth  width    slope     mann    r1    r2    w1    crrat  ks
qloss   qloss_t   qloss_f
        6665   33      0       0       3.710585       3.279134       3.710585       60.826032      0.003924
        0.020000       0.500000       0.500000       1.500000       1.500000       0.000000       0.000000
        0      0
        6671   33      0       0       0.000000       0.000000       0.000000       0.000000       0.001000
        0.020000       0.500000       0.500000       1.500000       1.500000       0.000000       0.000000
        0      0
        6673   33      0       0       1.351690       2.270340       1.351690       14.684861      0.005145
        0.020000       0.500000       0.500000       1.500000       1.500000       0.000000       0.000000
        0      0
        6674   33      0       0       0.000000       0.000000       0.000000       0.000000       0.001000
        0.020000       0.500000       0.500000       1.500000       1.500000       0.000000       0.000000
        0      0
        6675   33      0       0       1.289354       4.503094       1.289354       13.694059      0.009414
        0.020000       0.500000       0.500000       1.500000       1.500000       0.000000       0.000000
        0      0
        6684   40      0       0       0.744742       2.987388       0.744742       6.338506       0.008740
        0.020000       0.500000       0.500000       1.500000       1.500000       0.000000       0.000000
        0      0
        6839   33      0       0       0.000000       0.000000       0.000000       0.000000       0.001000
        0.020000       0.500000       0.500000       1.500000       1.500000       0.000000       0.000000
        0      0
        6844   40      0       0       0.000000       0.000000       0.000000       0.000000       0.001000
        0.020000       0.500000       0.500000       1.500000       1.500000       0.000000       0.000000
        0      0
        6850   33      0       0       0.000000       0.000000       0.000000       0.000000       0.001000
        0.020000       0.500000       0.500000       1.500000       1.500000       0.000000       0.000000
        0      0
        6856   40      0       0       0.748022       2.776538       0.748022       6.377875       0.006990
        0.020000       0.500000       0.500000       1.500000       1.500000       0.000000       0.000000
        0      0
        6859   33      0       0       0.000000       0.000000       0.000000       0.000000       0.001000
        0.020000       0.500000       0.500000       1.500000       1.500000       0.000000       0.000000
        0      0
        6861   40      0       0       0.000000       0.000000       0.000000       0.000000       0.001000
        0.020000       0.500000       0.500000       1.500000       1.500000       0.000000       0.000000
        0      0
c-------------------------------------------------------------------------------------------
c413 Reach Cross-section Information
c
c    rchid   x1 y1 x2 y2...
c    rchid   reach id (same as subbasin id)
c    x       distance from the left reach bank (ft)
c            it should not be greater than bank full width in card 410 (ft)
c    y       depth from the bank full reach segment (ft)
c            it should not be greater than bank full depth in card 410 (ft)
c
c-------------------------------------------------------------------------------------------
c415 reach discharge-volume relationship
c
c    rchid   reach id
c    depth   water depth (feet)
c    area    water surface area (acres)
c    vol     water volume (ac-ft)
c    disch(1, 2, 3, ....noutflows)  outflows (cfs)
c
c rchid  depth   area    vol    disch1    disch2   .......   dischN
c-------------------------------------------------------------------------------------------
c420 general point source information
c
c    nPtSource   number of individual point sources
c    nPtQuals    number of point source quals
c
c  nPtSource  nPtQuals
        0      0
c-------------------------------------------------------------------------------------------
c425 point source
c    Qualindex  point source qual index
```

```
c    Qualname   point source qual name
c    Qualid    point source qual id
c    sqalfr    point source sediment associated qual fraction (0-1)
c
c  Qualindex  Qualname  qualid
c-------------------------------------------------------------------------------------------
c430 point source withdrawal
c    subbasin  point source reach id
c    permit    point source permit
c    pipe      point source pipe
c    wd_target point source withdrawal target reach id
c
c  subbasin  permit  pipe   wd_target
c-------------------------------------------------------------------------------------------
c435 linkage controls (optional)
c
c    rchid         reach id (same as subbasin id)
c    outlet        outlet control switch for the corresponding reach
c                  0 = will read input timeseries file
c                      (rchid/outlet can be duplicated for multiple input files)
c                  n = will write output timeseries file for outlet n.
c    filepath      the timeseries file path (continuous string without space)
c
c rchid    outlet    filepath
c-------------------------------------------------------------------------------------------
c440 sediment parameters controls
c
c    crvfg   if crvfg = 1, erosion-related cover may vary throughout the year.
c            values are supplied in Table-type MON-COVER (card 453)
c    vsivfg  if vsivfg = 1, the rate of net vertical sediment input may vary throughout the year.
c            if vsivfg = 2, the vertical sediment input is added to the detached sediment storage only on days
when no rainfall occurred during the previous day.
c            values are supplied in Table-type MON-NVSI (card 454)
c    sandfg  if sandfg = 0, the sand is not simulated.
c            if sandfg = 1, the sand transport capacity is calculated using the Toffaleti method.
c            if sandfg = 2, the sand transport capacity is calculated using the Colby method.
c            if sandfg = 3, the sand transport capacity is calculated using the power function of velocity.
c    sweepfg if sweepfg = 0, the street sweeping is not simulated.
c            if sweepfg = 1, the street sweeping is applied to sediemnt only.
c            if sweepfg = 2, the street sweeping is applied to sediment and general water quality constituents.
c
c crvfg    vsivfg    sandfg    sweepfg
        0      0       3      0
c-------------------------------------------------------------------------------------------
c445 street sweeping for sediment (read if sedfg = 1)
c
c    defid         parameter group id
c    deluid        landuse id (impervious only)
c    deluname      landuse name
c    start_month   start month of street sweeping requirement
c    end_month     end month of street sweeping requirement
c    frequency     days between street sweeping within the landuse (0 for no sweeping)
c    percent_area  fraction of land surface which is available for street sweeping (0 for no sweeping)
c    effic_sand    fraction of sand in solids storage that is available for removal by sweeping (0-1)
c    effic_silt    fraction of silt in solids storage that is available for removal by sweeping (0-1)
c    effic_clay    fraction of clay in solids storage that is available for removal by sweeping (0-1)
c
c defid   deluid   deluname   start_month   end_month   frequency   percent_area   effic_sand   effic_silt
effic_clay
c-------------------------------------------------------------------------------------------
c446 street sweeping for GQual (read if sedfg = 1 and pqalfg = 1)
c
c    defid         parameter group id
c    deluid        landuse id (impervious only)
c    deluname      landuse name
c    effic_GQual   fraction of general water quality constituent in surface storage that is available for
removal by sweeping (0-1)
c
c defid   deluid   deluname   effic_GQual1   effic_GQual2 ... effic_GQualn
c-------------------------------------------------------------------------------------------
c450 sediment parameter group 1 (read if sedfg =1)
c
c    defid   parameter group id
c    deluid  landuse id
c    smpf    supporting management practice factor
c    krer    coefficient in the soil detachment equation
c    jrer    exponent in the soil detachment equation
c    affix   fraction by which detached sediment storage decreases each day as a result of
c            soil compaction. (/day)
```

```
c    cover   fraction of land surface which is shielded from rainfall erosion
c    nvsi    rate at which sediment enters detached storage from the atmosphere (lb/ac/day)
c            negative value may be used to simulate removal by human activity or wind
c    kser    coefficient in the detached sediment washoff equation
c    jser    exponent in the detached sediment washoff equation
c    kger    coefficient in the matrix soil scour equation, which simulates gully erosion
c    jger    exponent in the matrix soil scour equation, which simulates gully erosion
c    accsdp  rate at which solids accumulate on the land surface (used in impervious land)
c    remsdp  fraction of solids storage which is removed each day when there is no runoff,
c            for example, because of street sweeping (used in impervious land)
c
c defid deluid  smpf   krer   jrer  affix  cover    nvsi  kser   jser  kger  jger   accsdp remsdp
       33     1000   1.000000       0.000000       0.000000       0.000000       0.000000       0.000000
       0.200000       1.800000       0.000000       1.000000       0.004000       0.050000
       33     2000   1.000000       0.000000       0.000000       0.000000       0.000000       0.000000
       0.200000       1.800000       0.000000       1.000000       0.003000       0.050000
       33     3000   1.000000       0.000000       0.000000       0.000000       0.000000       0.000000
       0.200000       1.800000       0.000000       1.000000       0.002000       0.050000
       33     4000   1.000000       0.000000       0.000000       0.000000       0.000000       0.000000
       0.200000       1.800000       0.000000       1.000000       0.003000       0.050000
       33     5000   1.000000       0.000000       0.000000       0.000000       0.000000       0.000000
       0.200000       1.800000       0.000000       1.000000       0.001500       0.050000
       33     6000   1.000000       0.000000       0.000000       0.000000       0.000000       0.000000
       0.200000       1.800000       0.000000       1.000000       0.003000       0.050000
       33     7000   1.000000       0.000000       0.000000       0.000000       0.000000       0.000000
       0.200000       1.800000       0.000000       1.000000       0.004000       0.050000
       33     8000   1.000000       0.000000       0.000000       0.000000       0.000000       0.000000
       0.200000       1.800000       0.000000       1.000000       0.002500       0.050000
       33     9000   1.000000       0.000000       0.000000       0.000000       0.000000       0.000000
       0.200000       1.800000       0.000000       1.000000       0.000200       0.050000
       33     10000  1.000000       0.000000       0.000000       0.000000       0.000000       0.000000
       0.000000       1.800000       0.000000       1.000000       0.000000       0.000000
       33     11111  1.000000       0.200000       2.000000       0.100000       0.900000       0.000000
       0.200000       2.000000       0.000000       1.000000       0.000000       0.000000
       33     11112  1.000000       0.200000       2.000000       0.100000       0.900000       0.000000
       0.200000       2.000000       0.000000       1.000000       0.000000       0.000000
       33     11121  1.000000       0.200000       2.000000       0.100000       0.920000       0.000000
       0.350000       2.000000       0.000000       1.000000       0.000000       0.000000
       33     11122  1.000000       0.200000       2.000000       0.100000       0.920000       0.000000
       0.350000       2.000000       0.000000       1.000000       0.000000       0.000000
       33     11211  1.000000       0.400000       2.000000       0.100000       0.900000       0.000000
       0.200000       2.000000       0.000000       1.000000       0.000000       0.000000
       33     11212  1.000000       0.400000       2.000000       0.100000       0.900000       0.000000
       0.200000       2.000000       0.000000       1.000000       0.000000       0.000000
       33     11221  1.000000       0.400000       2.000000       0.100000       0.920000       0.000000
       0.350000       2.000000       0.000000       1.000000       0.000000       0.000000
       33     11222  1.000000       0.400000       2.000000       0.100000       0.920000       0.000000
       0.350000       2.000000       0.000000       1.000000       0.000000       0.000000
       33     11311  1.000000       0.250000       2.000000       0.100000       0.900000       0.000000
       0.200000       2.000000       0.000000       1.000000       0.000000       0.000000
       33     11312  1.000000       0.250000       2.000000       0.100000       0.900000       0.000000
       0.200000       2.000000       0.000000       1.000000       0.000000       0.000000
       33     11321  1.000000       0.250000       2.000000       0.100000       0.920000       0.000000
       0.350000       2.000000       0.000000       1.000000       0.000000       0.000000
       33     11322  1.000000       0.250000       2.000000       0.100000       0.920000       0.000000
       0.350000       2.000000       0.000000       1.000000       0.000000       0.000000
       33     11411  1.000000       0.150000       2.000000       0.100000       0.900000       0.000000
       0.200000       2.000000       0.000000       1.000000       0.000000       0.000000
       33     11412  1.000000       0.150000       2.000000       0.100000       0.900000       0.000000
       0.200000       2.000000       0.000000       1.000000       0.000000       0.000000
       33     11421  1.000000       0.150000       2.000000       0.100000       0.920000       0.000000
       0.350000       2.000000       0.000000       1.000000       0.000000       0.000000
       33     11422  1.000000       0.150000       2.000000       0.100000       0.920000       0.000000
       0.350000       2.000000       0.000000       1.000000       0.000000       0.000000
       33     12111  1.000000       0.200000       2.000000       0.100000       0.900000       0.000000
       0.200000       2.000000       0.000000       1.000000       0.000000       0.000000
       33     12112  1.000000       0.200000       2.000000       0.100000       0.900000       0.000000
       0.200000       2.000000       0.000000       1.000000       0.000000       0.000000
       33     12121  1.000000       0.200000       2.000000       0.100000       0.920000       0.000000
       0.350000       2.000000       0.000000       1.000000       0.000000       0.000000
       33     12122  1.000000       0.200000       2.000000       0.100000       0.920000       0.000000
       0.350000       2.000000       0.000000       1.000000       0.000000       0.000000
       33     12211  1.000000       0.400000       2.000000       0.100000       0.900000       0.000000
       0.200000       2.000000       0.000000       1.000000       0.000000       0.000000
       33     12212  1.000000       0.400000       2.000000       0.100000       0.900000       0.000000
       0.200000       2.000000       0.000000       1.000000       0.000000       0.000000
       33     12221  1.000000       0.400000       2.000000       0.100000       0.920000       0.000000
       0.350000       2.000000       0.000000       1.000000       0.000000       0.000000
```

```
33      12222 1.000000        0.400000       2.000000       0.100000       0.920000       0.000000
0.350000       2.000000       0.000000       1.000000       0.000000       0.000000
33      12311 1.000000        0.250000       2.000000       0.100000       0.900000       0.000000
0.200000       2.000000       0.000000       1.000000       0.000000       0.000000
33      12312 1.000000        0.250000       2.000000       0.100000       0.900000       0.000000
0.200000       2.000000       0.000000       1.000000       0.000000       0.000000
33      12321 1.000000        0.250000       2.000000       0.100000       0.920000       0.000000
0.350000       2.000000       0.000000       1.000000       0.000000       0.000000
33      12322 1.000000        0.250000       2.000000       0.100000       0.920000       0.000000
0.350000       2.000000       0.000000       1.000000       0.000000       0.000000
33      12411 1.000000        0.110000       2.000000       0.100000       0.900000       0.000000
0.200000       2.000000       0.000000       1.000000       0.000000       0.000000
33      12412 1.000000        0.110000       2.000000       0.100000       0.900000       0.000000
0.200000       2.000000       0.000000       1.000000       0.000000       0.000000
33      12421 1.000000        0.110000       2.000000       0.100000       0.920000       0.000000
0.350000       2.000000       0.000000       1.000000       0.000000       0.000000
33      12422 1.000000        0.110000       2.000000       0.100000       0.920000       0.000000
0.350000       2.000000       0.000000       1.000000       0.000000       0.000000
33      13111 1.000000        0.150000       2.000000       0.100000       0.800000       0.000000
0.200000       2.000000       1.500000       2.500000       0.000000       0.000000
33      13112 1.000000        0.150000       2.000000       0.100000       0.800000       0.000000
0.200000       2.000000       1.500000       2.500000       0.000000       0.000000
33      13121 1.000000        0.150000       2.000000       0.100000       0.500000       0.000000
0.350000       2.000000       1.500000       2.500000       0.000000       0.000000
33      13122 1.000000        0.150000       2.000000       0.100000       0.500000       0.000000
0.350000       2.000000       1.500000       2.500000       0.000000       0.000000
33      13211 1.000000        0.200000       2.000000       0.100000       0.800000       0.000000
0.200000       2.000000       1.500000       2.500000       0.000000       0.000000
33      13212 1.000000        0.200000       2.000000       0.100000       0.800000       0.000000
0.200000       2.000000       1.500000       2.500000       0.000000       0.000000
33      13221 1.000000        0.200000       2.000000       0.100000       0.500000       0.000000
0.350000       2.000000       1.500000       2.500000       0.000000       0.000000
33      13222 1.000000        0.200000       2.000000       0.100000       0.500000       0.000000
0.350000       2.000000       1.500000       2.500000       0.000000       0.000000
33      13231 1.000000        0.200000       2.000000       0.100000       0.300000       0.000000
0.500000       2.000000       1.500000       2.500000       0.000000       0.000000
33      13232 1.000000        0.200000       2.000000       0.100000       0.300000       0.000000
0.500000       2.000000       1.500000       2.500000       0.000000       0.000000
33      13311 1.000000        0.180000       2.000000       0.100000       0.800000       0.000000
0.200000       2.000000       1.500000       2.500000       0.000000       0.000000
33      13312 1.000000        0.180000       2.000000       0.100000       0.800000       0.000000
0.200000       2.000000       1.500000       2.500000       0.000000       0.000000
33      13321 1.000000        0.180000       2.000000       0.100000       0.500000       0.000000
0.350000       2.000000       1.500000       2.500000       0.000000       0.000000
33      13322 1.000000        0.180000       2.000000       0.100000       0.500000       0.000000
0.350000       2.000000       1.500000       2.500000       0.000000       0.000000
33      13331 1.000000        0.180000       2.000000       0.100000       0.300000       0.000000
0.500000       2.000000       1.500000       2.500000       0.000000       0.000000
33      13411 1.000000        0.220000       2.000000       0.100000       0.800000       0.000000
0.200000       2.000000       1.500000       2.500000       0.000000       0.000000
33      13412 1.000000        0.220000       2.000000       0.100000       0.800000       0.000000
0.200000       2.000000       1.500000       2.500000       0.000000       0.000000
33      13421 1.000000        0.220000       2.000000       0.100000       0.500000       0.000000
0.350000       2.000000       1.500000       2.500000       0.000000       0.000000
33      13422 1.000000        0.220000       2.000000       0.100000       0.500000       0.000000
0.350000       2.000000       1.500000       2.500000       0.000000       0.000000
33      13431 1.000000        0.220000       2.000000       0.100000       0.300000       0.000000
0.500000       2.000000       1.500000       2.500000       0.000000       0.000000
33      13432 1.000000        0.220000       2.000000       0.100000       0.300000       0.000000
0.500000       2.000000       1.500000       2.500000       0.000000       0.000000
33      14121 1.000000        0.225000       2.000000       0.100000       0.700000       0.000000
0.350000       2.000000       0.750000       2.500000       0.000000       0.000000
33      14122 1.000000        0.225000       2.000000       0.100000       0.700000       0.000000
0.350000       2.000000       0.750000       2.500000       0.000000       0.000000
33      14131 1.000000        0.225000       2.000000       0.100000       0.900000       0.000000
0.500000       2.000000       0.750000       2.500000       0.000000       0.000000
33      14132 1.000000        0.225000       2.000000       0.100000       0.900000       0.000000
0.500000       2.000000       0.750000       2.500000       0.000000       0.000000
33      14221 1.000000        0.330000       2.000000       0.100000       0.700000       0.000000
0.350000       2.000000       0.750000       2.500000       0.000000       0.000000
33      14222 1.000000        0.330000       2.000000       0.100000       0.700000       0.000000
0.350000       2.000000       0.750000       2.500000       0.000000       0.000000
33      14231 1.000000        0.330000       2.000000       0.100000       0.800000       0.000000
0.500000       2.000000       0.750000       2.500000       0.000000       0.000000
33      14232 1.000000        0.330000       2.000000       0.100000       0.800000       0.000000
0.500000       2.000000       0.750000       2.500000       0.000000       0.000000
33      14321 1.000000        0.405000       2.000000       0.100000       0.700000       0.000000
0.350000       2.000000       0.750000       2.500000       0.000000       0.000000
```

```
33      14322  1.000000       0.405000       2.000000       0.100000       0.700000       0.000000
0.350000       2.000000       0.750000       2.500000       0.000000       0.000000
33      14331  1.000000       0.405000       2.000000       0.100000       0.600000       0.000000
0.500000       2.000000       0.750000       2.500000       0.000000       0.000000
33      14332  1.000000       0.405000       2.000000       0.100000       0.600000       0.000000
0.500000       2.000000       0.750000       2.500000       0.000000       0.000000
33      14421  1.000000       0.330000       2.000000       0.100000       0.700000       0.000000
0.350000       2.000000       0.750000       2.500000       0.000000       0.000000
33      14422  1.000000       0.330000       2.000000       0.100000       0.700000       0.000000
0.350000       2.000000       0.750000       2.500000       0.000000       0.000000
33      14431  1.000000       0.330000       2.000000       0.100000       0.600000       0.000000
0.500000       2.000000       0.750000       2.500000       0.000000       0.000000
33      14432  1.000000       0.330000       2.000000       0.100000       0.600000       0.000000
0.500000       2.000000       0.750000       2.500000       0.000000       0.000000
33      15121  1.000000       0.075000       2.000000       0.100000       0.700000       0.000000
0.350000       2.000000       0.375000       2.500000       0.000000       0.000000
33      15122  1.000000       0.075000       2.000000       0.100000       0.700000       0.000000
0.350000       2.000000       0.375000       2.500000       0.000000       0.000000
33      15131  1.000000       0.075000       2.000000       0.100000       0.900000       0.000000
0.500000       2.000000       0.375000       2.500000       0.000000       0.000000
33      15132  1.000000       0.075000       2.000000       0.100000       0.900000       0.000000
0.500000       2.000000       0.375000       2.500000       0.000000       0.000000
33      15221  1.000000       0.110000       2.000000       0.100000       0.700000       0.000000
0.350000       2.000000       0.375000       2.500000       0.000000       0.000000
33      15222  1.000000       0.110000       2.000000       0.100000       0.700000       0.000000
0.350000       2.000000       0.375000       2.500000       0.000000       0.000000
33      15231  1.000000       0.110000       2.000000       0.100000       0.800000       0.000000
0.500000       2.000000       0.375000       2.500000       0.000000       0.000000
33      15232  1.000000       0.110000       2.000000       0.100000       0.800000       0.000000
0.500000       2.000000       0.375000       2.500000       0.000000       0.000000
33      15321  1.000000       0.135000       2.000000       0.100000       0.700000       0.000000
0.350000       2.000000       0.375000       2.500000       0.000000       0.000000
33      15322  1.000000       0.135000       2.000000       0.100000       0.700000       0.000000
0.350000       2.000000       0.375000       2.500000       0.000000       0.000000
33      15331  1.000000       0.135000       2.000000       0.100000       0.700000       0.000000
0.500000       2.000000       0.375000       2.500000       0.000000       0.000000
33      15332  1.000000       0.135000       2.000000       0.100000       0.700000       0.000000
0.500000       2.000000       0.375000       2.500000       0.000000       0.000000
33      15421  1.000000       0.011000       2.000000       0.100000       0.700000       0.000000
0.350000       2.000000       0.075000       2.500000       0.000000       0.000000
33      15422  1.000000       0.011000       2.000000       0.100000       0.700000       0.000000
0.350000       2.000000       0.075000       2.500000       0.000000       0.000000
33      15431  1.000000       0.011000       2.000000       0.100000       0.900000       0.000000
0.500000       2.000000       0.075000       2.500000       0.000000       0.000000
33      15432  1.000000       0.011000       2.000000       0.100000       0.900000       0.000000
0.500000       2.000000       0.075000       2.500000       0.000000       0.000000
33      16000  1.000000       0.000000       2.000000       0.100000       0.000000       0.000000
0.000000       2.000000       0.000000       1.000000       0.000000       0.000000
40      1000   1.000000       0.000000       0.000000       0.000000       0.000000       0.000000
0.200000       1.800000       0.000000       1.000000       0.004000       0.050000
40      2000   1.000000       0.000000       0.000000       0.000000       0.000000       0.000000
0.200000       1.800000       0.000000       1.000000       0.003000       0.050000
40      3000   1.000000       0.000000       0.000000       0.000000       0.000000       0.000000
0.200000       1.800000       0.000000       1.000000       0.002000       0.050000
40      4000   1.000000       0.000000       0.000000       0.000000       0.000000       0.000000
0.200000       1.800000       0.000000       1.000000       0.003000       0.050000
40      5000   1.000000       0.000000       0.000000       0.000000       0.000000       0.000000
0.200000       1.800000       0.000000       1.000000       0.001500       0.050000
40      6000   1.000000       0.000000       0.000000       0.000000       0.000000       0.000000
0.200000       1.800000       0.000000       1.000000       0.003000       0.050000
40      7000   1.000000       0.000000       0.000000       0.000000       0.000000       0.000000
0.200000       1.800000       0.000000       1.000000       0.004000       0.050000
40      8000   1.000000       0.000000       0.000000       0.000000       0.000000       0.000000
0.200000       1.800000       0.000000       1.000000       0.002500       0.050000
40      9000   1.000000       0.000000       0.000000       0.000000       0.000000       0.000000
0.200000       1.800000       0.000000       1.000000       0.000200       0.050000
40      10000  1.000000       0.000000       0.000000       0.000000       0.000000       0.000000
0.000000       1.800000       0.000000       1.000000       0.000000       0.000000
40      11111  1.000000       0.200000       2.000000       0.100000       0.900000       0.000000
0.200000       2.000000       0.000000       1.000000       0.000000       0.000000
40      11112  1.000000       0.200000       2.000000       0.100000       0.900000       0.000000
0.200000       2.000000       0.000000       1.000000       0.000000       0.000000
40      11121  1.000000       0.200000       2.000000       0.100000       0.920000       0.000000
0.350000       2.000000       0.000000       1.000000       0.000000       0.000000
40      11122  1.000000       0.200000       2.000000       0.100000       0.920000       0.000000
0.350000       2.000000       0.000000       1.000000       0.000000       0.000000
40      11211  1.000000       0.400000       2.000000       0.100000       0.900000       0.000000
0.200000       2.000000       0.000000       1.000000       0.000000       0.000000
```

```
40      11212  1.000000       0.400000       2.000000       0.100000       0.900000       0.000000
0.200000       2.000000       0.000000       1.000000       0.000000       0.000000
40      11221  1.000000       0.400000       2.000000       0.100000       0.920000       0.000000
0.350000       2.000000       0.000000       1.000000       0.000000       0.000000
40      11222  1.000000       0.400000       2.000000       0.100000       0.920000       0.000000
0.350000       2.000000       0.000000       1.000000       0.000000       0.000000
40      11311  1.000000       0.250000       2.000000       0.100000       0.900000       0.000000
0.200000       2.000000       0.000000       1.000000       0.000000       0.000000
40      11312  1.000000       0.250000       2.000000       0.100000       0.900000       0.000000
0.200000       2.000000       0.000000       1.000000       0.000000       0.000000
40      11321  1.000000       0.250000       2.000000       0.100000       0.920000       0.000000
0.350000       2.000000       0.000000       1.000000       0.000000       0.000000
40      11322  1.000000       0.250000       2.000000       0.100000       0.920000       0.000000
0.350000       2.000000       0.000000       1.000000       0.000000       0.000000
40      11411  1.000000       0.150000       2.000000       0.100000       0.900000       0.000000
0.200000       2.000000       0.000000       1.000000       0.000000       0.000000
40      11412  1.000000       0.150000       2.000000       0.100000       0.900000       0.000000
0.200000       2.000000       0.000000       1.000000       0.000000       0.000000
40      11421  1.000000       0.150000       2.000000       0.100000       0.920000       0.000000
0.350000       2.000000       0.000000       1.000000       0.000000       0.000000
40      11422  1.000000       0.150000       2.000000       0.100000       0.920000       0.000000
0.350000       2.000000       0.000000       1.000000       0.000000       0.000000
40      12111  1.000000       0.200000       2.000000       0.100000       0.900000       0.000000
0.200000       2.000000       0.000000       1.000000       0.000000       0.000000
40      12112  1.000000       0.200000       2.000000       0.100000       0.900000       0.000000
0.200000       2.000000       0.000000       1.000000       0.000000       0.000000
40      12121  1.000000       0.200000       2.000000       0.100000       0.920000       0.000000
0.350000       2.000000       0.000000       1.000000       0.000000       0.000000
40      12122  1.000000       0.200000       2.000000       0.100000       0.920000       0.000000
0.350000       2.000000       0.000000       1.000000       0.000000       0.000000
40      12211  1.000000       0.400000       2.000000       0.100000       0.900000       0.000000
0.200000       2.000000       0.000000       1.000000       0.000000       0.000000
40      12212  1.000000       0.400000       2.000000       0.100000       0.900000       0.000000
0.200000       2.000000       0.000000       1.000000       0.000000       0.000000
40      12221  1.000000       0.400000       2.000000       0.100000       0.920000       0.000000
0.350000       2.000000       0.000000       1.000000       0.000000       0.000000
40      12222  1.000000       0.400000       2.000000       0.100000       0.920000       0.000000
0.350000       2.000000       0.000000       1.000000       0.000000       0.000000
40      12311  1.000000       0.250000       2.000000       0.100000       0.900000       0.000000
0.200000       2.000000       0.000000       1.000000       0.000000       0.000000
40      12312  1.000000       0.250000       2.000000       0.100000       0.900000       0.000000
0.200000       2.000000       0.000000       1.000000       0.000000       0.000000
40      12321  1.000000       0.250000       2.000000       0.100000       0.920000       0.000000
0.350000       2.000000       0.000000       1.000000       0.000000       0.000000
40      12322  1.000000       0.250000       2.000000       0.100000       0.920000       0.000000
0.350000       2.000000       0.000000       1.000000       0.000000       0.000000
40      12411  1.000000       0.110000       2.000000       0.100000       0.900000       0.000000
0.200000       2.000000       0.000000       1.000000       0.000000       0.000000
40      12412  1.000000       0.110000       2.000000       0.100000       0.900000       0.000000
0.200000       2.000000       0.000000       1.000000       0.000000       0.000000
40      12421  1.000000       0.110000       2.000000       0.100000       0.920000       0.000000
0.350000       2.000000       0.000000       1.000000       0.000000       0.000000
40      12422  1.000000       0.110000       2.000000       0.100000       0.920000       0.000000
0.350000       2.000000       0.000000       1.000000       0.000000       0.000000
40      13111  1.000000       0.150000       2.000000       0.100000       0.800000       0.000000
0.200000       2.000000       1.500000       2.500000       0.000000       0.000000
40      13112  1.000000       0.150000       2.000000       0.100000       0.800000       0.000000
0.200000       2.000000       1.500000       2.500000       0.000000       0.000000
40      13121  1.000000       0.150000       2.000000       0.100000       0.500000       0.000000
0.350000       2.000000       1.500000       2.500000       0.000000       0.000000
40      13122  1.000000       0.150000       2.000000       0.100000       0.500000       0.000000
0.350000       2.000000       1.500000       2.500000       0.000000       0.000000
40      13211  1.000000       0.200000       2.000000       0.100000       0.800000       0.000000
0.200000       2.000000       1.500000       2.500000       0.000000       0.000000
40      13212  1.000000       0.200000       2.000000       0.100000       0.800000       0.000000
0.200000       2.000000       1.500000       2.500000       0.000000       0.000000
40      13221  1.000000       0.200000       2.000000       0.100000       0.500000       0.000000
0.350000       2.000000       1.500000       2.500000       0.000000       0.000000
40      13222  1.000000       0.200000       2.000000       0.100000       0.500000       0.000000
0.350000       2.000000       1.500000       2.500000       0.000000       0.000000
40      13231  1.000000       0.200000       2.000000       0.100000       0.300000       0.000000
0.500000       2.000000       1.500000       2.500000       0.000000       0.000000
40      13232  1.000000       0.200000       2.000000       0.100000       0.300000       0.000000
0.500000       2.000000       1.500000       2.500000       0.000000       0.000000
40      13311  1.000000       0.180000       2.000000       0.100000       0.800000       0.000000
0.200000       2.000000       1.500000       2.500000       0.000000       0.000000
40      13312  1.000000       0.180000       2.000000       0.100000       0.800000       0.000000
0.200000       2.000000       1.500000       2.500000       0.000000       0.000000
```

```
40      13321  1.000000       0.180000       2.000000       0.100000       0.500000       0.000000
0.350000       2.000000       1.500000       2.500000       0.000000       0.000000
40      13322  1.000000       0.180000       2.000000       0.100000       0.500000       0.000000
0.350000       2.000000       1.500000       2.500000       0.000000       0.000000
40      13331  1.000000       0.180000       2.000000       0.100000       0.300000       0.000000
0.500000       2.000000       1.500000       2.500000       0.000000       0.000000
40      13411  1.000000       0.220000       2.000000       0.100000       0.800000       0.000000
0.200000       2.000000       1.500000       2.500000       0.000000       0.000000
40      13412  1.000000       0.220000       2.000000       0.100000       0.800000       0.000000
0.200000       2.000000       1.500000       2.500000       0.000000       0.000000
40      13421  1.000000       0.220000       2.000000       0.100000       0.500000       0.000000
0.350000       2.000000       1.500000       2.500000       0.000000       0.000000
40      13422  1.000000       0.220000       2.000000       0.100000       0.500000       0.000000
0.350000       2.000000       1.500000       2.500000       0.000000       0.000000
40      13431  1.000000       0.220000       2.000000       0.100000       0.300000       0.000000
0.500000       2.000000       1.500000       2.500000       0.000000       0.000000
40      13432  1.000000       0.220000       2.000000       0.100000       0.300000       0.000000
0.500000       2.000000       1.500000       2.500000       0.000000       0.000000
40      14121  1.000000       0.225000       2.000000       0.100000       0.700000       0.000000
0.350000       2.000000       0.750000       2.500000       0.000000       0.000000
40      14122  1.000000       0.225000       2.000000       0.100000       0.700000       0.000000
0.350000       2.000000       0.750000       2.500000       0.000000       0.000000
40      14131  1.000000       0.225000       2.000000       0.100000       0.900000       0.000000
0.500000       2.000000       0.750000       2.500000       0.000000       0.000000
40      14132  1.000000       0.225000       2.000000       0.100000       0.900000       0.000000
0.500000       2.000000       0.750000       2.500000       0.000000       0.000000
40      14221  1.000000       0.330000       2.000000       0.100000       0.700000       0.000000
0.350000       2.000000       0.750000       2.500000       0.000000       0.000000
40      14222  1.000000       0.330000       2.000000       0.100000       0.700000       0.000000
0.350000       2.000000       0.750000       2.500000       0.000000       0.000000
40      14231  1.000000       0.330000       2.000000       0.100000       0.800000       0.000000
0.500000       2.000000       0.750000       2.500000       0.000000       0.000000
40      14232  1.000000       0.330000       2.000000       0.100000       0.800000       0.000000
0.500000       2.000000       0.750000       2.500000       0.000000       0.000000
40      14321  1.000000       0.405000       2.000000       0.100000       0.700000       0.000000
0.350000       2.000000       0.750000       2.500000       0.000000       0.000000
40      14322  1.000000       0.405000       2.000000       0.100000       0.700000       0.000000
0.350000       2.000000       0.750000       2.500000       0.000000       0.000000
40      14331  1.000000       0.405000       2.000000       0.100000       0.600000       0.000000
0.500000       2.000000       0.750000       2.500000       0.000000       0.000000
40      14332  1.000000       0.405000       2.000000       0.100000       0.600000       0.000000
0.500000       2.000000       0.750000       2.500000       0.000000       0.000000
40      14421  1.000000       0.330000       2.000000       0.100000       0.700000       0.000000
0.350000       2.000000       0.750000       2.500000       0.000000       0.000000
40      14422  1.000000       0.330000       2.000000       0.100000       0.700000       0.000000
0.350000       2.000000       0.750000       2.500000       0.000000       0.000000
40      14431  1.000000       0.330000       2.000000       0.100000       0.600000       0.000000
0.500000       2.000000       0.750000       2.500000       0.000000       0.000000
40      14432  1.000000       0.330000       2.000000       0.100000       0.600000       0.000000
0.500000       2.000000       0.750000       2.500000       0.000000       0.000000
40      15121  1.000000       0.075000       2.000000       0.100000       0.700000       0.000000
0.350000       2.000000       0.375000       2.500000       0.000000       0.000000
40      15122  1.000000       0.075000       2.000000       0.100000       0.700000       0.000000
0.350000       2.000000       0.375000       2.500000       0.000000       0.000000
40      15131  1.000000       0.075000       2.000000       0.100000       0.900000       0.000000
0.500000       2.000000       0.375000       2.500000       0.000000       0.000000
40      15132  1.000000       0.075000       2.000000       0.100000       0.900000       0.000000
0.500000       2.000000       0.375000       2.500000       0.000000       0.000000
40      15221  1.000000       0.110000       2.000000       0.100000       0.700000       0.000000
0.350000       2.000000       0.375000       2.500000       0.000000       0.000000
40      15222  1.000000       0.110000       2.000000       0.100000       0.700000       0.000000
0.350000       2.000000       0.375000       2.500000       0.000000       0.000000
40      15231  1.000000       0.110000       2.000000       0.100000       0.800000       0.000000
0.500000       2.000000       0.375000       2.500000       0.000000       0.000000
40      15232  1.000000       0.110000       2.000000       0.100000       0.800000       0.000000
0.500000       2.000000       0.375000       2.500000       0.000000       0.000000
40      15321  1.000000       0.135000       2.000000       0.100000       0.700000       0.000000
0.350000       2.000000       0.375000       2.500000       0.000000       0.000000
40      15322  1.000000       0.135000       2.000000       0.100000       0.700000       0.000000
0.350000       2.000000       0.375000       2.500000       0.000000       0.000000
40      15331  1.000000       0.135000       2.000000       0.100000       0.700000       0.000000
0.500000       2.000000       0.375000       2.500000       0.000000       0.000000
40      15332  1.000000       0.135000       2.000000       0.100000       0.700000       0.000000
0.500000       2.000000       0.375000       2.500000       0.000000       0.000000
40      15421  1.000000       0.011000       2.000000       0.100000       0.700000       0.000000
0.350000       2.000000       0.075000       2.500000       0.000000       0.000000
40      15422  1.000000       0.011000       2.000000       0.100000       0.700000       0.000000
0.350000       2.000000       0.075000       2.500000       0.000000       0.000000
```

```
       40     15431  1.000000      0.011000      2.000000      0.100000      0.900000      0.000000
       0.500000      2.000000      0.075000      2.500000      0.000000      0.000000
       40     15432  1.000000      0.011000      2.000000      0.100000      0.900000      0.000000
       0.500000      2.000000      0.075000      2.500000      0.000000      0.000000
       40     16000  1.000000      0.000000      2.000000      0.100000      0.000000      0.000000
       0.000000      2.000000      0.000000      1.000000      0.000000      0.000000
c------------------------------------------------------------------------------------------
c451 sediment parameter group 2 (read if sedfg =1)
c
c    defid     parameter group id
c    deluid    landuse id
c    sed-suro  background concentration associated with surface flow (mg/l)
c    sed-ifwo  background concentration associated with interflow outflow (mg/l)
c    sed-agwo  background concentration associated with groundwater outflow (mg/l)
c    sed_i     fraction of sediment class_i (sand, silt, and clay)
c
c    (sand + silt + clay = 1)
c    Background sediment load is added to total sediment from LAND prior to applying fractions
c
c defid   deluid    sed_suro   sed_ifwo   sed_agwo   sed_1   sed_2   sed_3 ........sed_n
       33     1000   0.000000      0.000000      0.000000      0.100000      0.700000      0.200000
       33     2000   0.000000      0.000000      0.000000      0.100000      0.700000      0.200000
       33     3000   0.000000      0.000000      0.000000      0.100000      0.700000      0.200000
       33     4000   0.000000      0.000000      0.000000      0.100000      0.700000      0.200000
       33     5000   0.000000      0.000000      0.000000      0.100000      0.700000      0.200000
       33     6000   0.000000      0.000000      0.000000      0.100000      0.700000      0.200000
       33     7000   0.000000      0.000000      0.000000      0.100000      0.700000      0.200000
       33     8000   0.000000      0.000000      0.000000      0.100000      0.700000      0.200000
       33     9000   0.000000      0.000000      0.000000      0.100000      0.700000      0.200000
       33     10000  150.000000    0.000000      0.000000      0.100000      0.700000      0.200000
       33     11111  0.000000      1.000000      1.000000      0.700000      0.100000      0.200000
       33     11112  0.000000      1.000000      1.000000      0.700000      0.100000      0.200000
       33     11121  0.000000      1.000000      1.000000      0.700000      0.100000      0.200000
       33     11122  0.000000      1.000000      1.000000      0.700000      0.100000      0.200000
       33     11211  0.000000      1.000000      1.000000      0.200000      0.650000      0.150000
       33     11212  0.000000      1.000000      1.000000      0.200000      0.650000      0.150000
       33     11221  0.000000      1.000000      1.000000      0.200000      0.650000      0.150000
       33     11222  0.000000      1.000000      1.000000      0.200000      0.650000      0.150000
       33     11311  0.000000      1.000000      1.000000      0.500000      0.200000      0.300000
       33     11312  0.000000      1.000000      1.000000      0.500000      0.200000      0.300000
       33     11321  0.000000      1.000000      1.000000      0.500000      0.200000      0.300000
       33     11322  0.000000      1.000000      1.000000      0.500000      0.200000      0.300000
       33     11411  0.000000      1.000000      1.000000      0.600000      0.200000      0.200000
       33     11412  0.000000      1.000000      1.000000      0.600000      0.200000      0.200000
       33     11421  0.000000      1.000000      1.000000      0.600000      0.200000      0.200000
       33     11422  0.000000      1.000000      1.000000      0.600000      0.200000      0.200000
       33     12111  0.000000      1.000000      1.000000      0.700000      0.100000      0.200000
       33     12112  0.000000      1.000000      1.000000      0.700000      0.100000      0.200000
       33     12121  0.000000      1.000000      1.000000      0.700000      0.100000      0.200000
       33     12122  0.000000      1.000000      1.000000      0.700000      0.100000      0.200000
       33     12211  0.000000      1.000000      1.000000      0.200000      0.650000      0.150000
       33     12212  0.000000      1.000000      1.000000      0.200000      0.650000      0.150000
       33     12221  0.000000      1.000000      1.000000      0.200000      0.650000      0.150000
       33     12222  0.000000      1.000000      1.000000      0.200000      0.650000      0.150000
       33     12311  0.000000      1.000000      1.000000      0.500000      0.200000      0.300000
       33     12312  0.000000      1.000000      1.000000      0.500000      0.200000      0.300000
       33     12321  0.000000      1.000000      1.000000      0.500000      0.200000      0.300000
       33     12322  0.000000      1.000000      1.000000      0.500000      0.200000      0.300000
       33     12411  0.000000      1.000000      1.000000      0.600000      0.200000      0.200000
       33     12412  0.000000      1.000000      1.000000      0.600000      0.200000      0.200000
       33     12421  0.000000      1.000000      1.000000      0.600000      0.200000      0.200000
       33     12422  0.000000      1.000000      1.000000      0.600000      0.200000      0.200000
       33     13111  0.000000      1.000000      1.000000      0.700000      0.100000      0.200000
       33     13112  0.000000      1.000000      1.000000      0.700000      0.100000      0.200000
       33     13121  0.000000      1.000000      1.000000      0.700000      0.100000      0.200000
       33     13122  0.000000      1.000000      1.000000      0.700000      0.100000      0.200000
       33     13211  0.000000      1.000000      1.000000      0.200000      0.650000      0.150000
       33     13212  0.000000      1.000000      1.000000      0.200000      0.650000      0.150000
       33     13221  0.000000      1.000000      1.000000      0.200000      0.650000      0.150000
       33     13222  0.000000      1.000000      1.000000      0.200000      0.650000      0.150000
       33     13231  0.000000      1.000000      1.000000      0.200000      0.650000      0.150000
       33     13232  0.000000      1.000000      1.000000      0.200000      0.650000      0.150000
       33     13311  0.000000      1.000000      1.000000      0.500000      0.200000      0.300000
       33     13312  0.000000      1.000000      1.000000      0.500000      0.200000      0.300000
       33     13321  0.000000      1.000000      1.000000      0.500000      0.200000      0.300000
       33     13322  0.000000      1.000000      1.000000      0.500000      0.200000      0.300000
       33     13331  0.000000      1.000000      1.000000      0.500000      0.200000      0.300000
       33     13411  0.000000      1.000000      1.000000      0.600000      0.200000      0.200000
       33     13412  0.000000      1.000000      1.000000      0.600000      0.200000      0.200000
```

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 33 | 13421 | 0.000000 | 1.000000 | 1.000000 | 0.600000 | 0.200000 | 0.200000 |
| 33 | 13422 | 0.000000 | 1.000000 | 1.000000 | 0.600000 | 0.200000 | 0.200000 |
| 33 | 13431 | 0.000000 | 1.000000 | 1.000000 | 0.600000 | 0.200000 | 0.200000 |
| 33 | 13432 | 0.000000 | 1.000000 | 1.000000 | 0.600000 | 0.200000 | 0.200000 |
| 33 | 14121 | 0.000000 | 1.000000 | 1.000000 | 0.700000 | 0.100000 | 0.200000 |
| 33 | 14122 | 0.000000 | 1.000000 | 1.000000 | 0.700000 | 0.100000 | 0.200000 |
| 33 | 14131 | 0.000000 | 1.000000 | 1.000000 | 0.700000 | 0.100000 | 0.200000 |
| 33 | 14132 | 0.000000 | 1.000000 | 1.000000 | 0.700000 | 0.100000 | 0.200000 |
| 33 | 14221 | 0.000000 | 1.000000 | 1.000000 | 0.200000 | 0.650000 | 0.150000 |
| 33 | 14222 | 0.000000 | 1.000000 | 1.000000 | 0.200000 | 0.650000 | 0.150000 |
| 33 | 14231 | 0.000000 | 1.000000 | 1.000000 | 0.200000 | 0.650000 | 0.150000 |
| 33 | 14232 | 0.000000 | 1.000000 | 1.000000 | 0.200000 | 0.650000 | 0.150000 |
| 33 | 14321 | 0.000000 | 1.000000 | 1.000000 | 0.500000 | 0.200000 | 0.300000 |
| 33 | 14322 | 0.000000 | 1.000000 | 1.000000 | 0.500000 | 0.200000 | 0.300000 |
| 33 | 14331 | 0.000000 | 1.000000 | 1.000000 | 0.500000 | 0.200000 | 0.300000 |
| 33 | 14332 | 0.000000 | 1.000000 | 1.000000 | 0.500000 | 0.200000 | 0.300000 |
| 33 | 14421 | 0.000000 | 1.000000 | 1.000000 | 0.600000 | 0.200000 | 0.200000 |
| 33 | 14422 | 0.000000 | 1.000000 | 1.000000 | 0.600000 | 0.200000 | 0.200000 |
| 33 | 14431 | 0.000000 | 1.000000 | 1.000000 | 0.600000 | 0.200000 | 0.200000 |
| 33 | 14432 | 0.000000 | 1.000000 | 1.000000 | 0.600000 | 0.200000 | 0.200000 |
| 33 | 15121 | 0.000000 | 1.000000 | 1.000000 | 0.700000 | 0.100000 | 0.200000 |
| 33 | 15122 | 0.000000 | 1.000000 | 1.000000 | 0.700000 | 0.100000 | 0.200000 |
| 33 | 15131 | 0.000000 | 1.000000 | 1.000000 | 0.700000 | 0.100000 | 0.200000 |
| 33 | 15132 | 0.000000 | 1.000000 | 1.000000 | 0.700000 | 0.100000 | 0.200000 |
| 33 | 15221 | 0.000000 | 1.000000 | 1.000000 | 0.200000 | 0.650000 | 0.150000 |
| 33 | 15222 | 0.000000 | 1.000000 | 1.000000 | 0.200000 | 0.650000 | 0.150000 |
| 33 | 15231 | 0.000000 | 1.000000 | 1.000000 | 0.200000 | 0.650000 | 0.150000 |
| 33 | 15232 | 0.000000 | 1.000000 | 1.000000 | 0.200000 | 0.650000 | 0.150000 |
| 33 | 15321 | 0.000000 | 1.000000 | 1.000000 | 0.500000 | 0.200000 | 0.300000 |
| 33 | 15322 | 0.000000 | 1.000000 | 1.000000 | 0.500000 | 0.200000 | 0.300000 |
| 33 | 15331 | 0.000000 | 1.000000 | 1.000000 | 0.500000 | 0.200000 | 0.300000 |
| 33 | 15332 | 0.000000 | 1.000000 | 1.000000 | 0.500000 | 0.200000 | 0.300000 |
| 33 | 15421 | 0.000000 | 1.000000 | 1.000000 | 0.600000 | 0.200000 | 0.200000 |
| 33 | 15422 | 0.000000 | 1.000000 | 1.000000 | 0.600000 | 0.200000 | 0.200000 |
| 33 | 15431 | 0.000000 | 1.000000 | 1.000000 | 0.600000 | 0.200000 | 0.200000 |
| 33 | 15432 | 0.000000 | 1.000000 | 1.000000 | 0.600000 | 0.200000 | 0.200000 |
| 33 | 16000 | 0.000000 | 0.000000 | 0.000000 | 0.000000 | 0.000000 | 0.000000 |
| 40 | 1000 | 0.000000 | 0.000000 | 0.000000 | 0.100000 | 0.700000 | 0.200000 |
| 40 | 2000 | 0.000000 | 0.000000 | 0.000000 | 0.100000 | 0.700000 | 0.200000 |
| 40 | 3000 | 0.000000 | 0.000000 | 0.000000 | 0.100000 | 0.700000 | 0.200000 |
| 40 | 4000 | 0.000000 | 0.000000 | 0.000000 | 0.100000 | 0.700000 | 0.200000 |
| 40 | 5000 | 0.000000 | 0.000000 | 0.000000 | 0.100000 | 0.700000 | 0.200000 |
| 40 | 6000 | 0.000000 | 0.000000 | 0.000000 | 0.100000 | 0.700000 | 0.200000 |
| 40 | 7000 | 0.000000 | 0.000000 | 0.000000 | 0.100000 | 0.700000 | 0.200000 |
| 40 | 8000 | 0.000000 | 0.000000 | 0.000000 | 0.100000 | 0.700000 | 0.200000 |
| 40 | 9000 | 0.000000 | 0.000000 | 0.000000 | 0.100000 | 0.700000 | 0.200000 |
| 40 | 10000 | 150.000000 | 0.000000 | 0.000000 | 0.100000 | 0.700000 | 0.200000 |
| 40 | 11111 | 0.000000 | 1.000000 | 1.000000 | 0.700000 | 0.100000 | 0.200000 |
| 40 | 11112 | 0.000000 | 1.000000 | 1.000000 | 0.700000 | 0.100000 | 0.200000 |
| 40 | 11121 | 0.000000 | 1.000000 | 1.000000 | 0.700000 | 0.100000 | 0.200000 |
| 40 | 11122 | 0.000000 | 1.000000 | 1.000000 | 0.700000 | 0.100000 | 0.200000 |
| 40 | 11211 | 0.000000 | 1.000000 | 1.000000 | 0.200000 | 0.650000 | 0.150000 |
| 40 | 11212 | 0.000000 | 1.000000 | 1.000000 | 0.200000 | 0.650000 | 0.150000 |
| 40 | 11221 | 0.000000 | 1.000000 | 1.000000 | 0.200000 | 0.650000 | 0.150000 |
| 40 | 11222 | 0.000000 | 1.000000 | 1.000000 | 0.200000 | 0.650000 | 0.150000 |
| 40 | 11311 | 0.000000 | 1.000000 | 1.000000 | 0.500000 | 0.200000 | 0.300000 |
| 40 | 11312 | 0.000000 | 1.000000 | 1.000000 | 0.500000 | 0.200000 | 0.300000 |
| 40 | 11321 | 0.000000 | 1.000000 | 1.000000 | 0.500000 | 0.200000 | 0.300000 |
| 40 | 11322 | 0.000000 | 1.000000 | 1.000000 | 0.500000 | 0.200000 | 0.300000 |
| 40 | 11411 | 0.000000 | 1.000000 | 1.000000 | 0.600000 | 0.200000 | 0.200000 |
| 40 | 11412 | 0.000000 | 1.000000 | 1.000000 | 0.600000 | 0.200000 | 0.200000 |
| 40 | 11421 | 0.000000 | 1.000000 | 1.000000 | 0.600000 | 0.200000 | 0.200000 |
| 40 | 11422 | 0.000000 | 1.000000 | 1.000000 | 0.600000 | 0.200000 | 0.200000 |
| 40 | 12111 | 0.000000 | 1.000000 | 1.000000 | 0.700000 | 0.100000 | 0.200000 |
| 40 | 12112 | 0.000000 | 1.000000 | 1.000000 | 0.700000 | 0.100000 | 0.200000 |
| 40 | 12121 | 0.000000 | 1.000000 | 1.000000 | 0.700000 | 0.100000 | 0.200000 |
| 40 | 12122 | 0.000000 | 1.000000 | 1.000000 | 0.700000 | 0.100000 | 0.200000 |
| 40 | 12211 | 0.000000 | 1.000000 | 1.000000 | 0.200000 | 0.650000 | 0.150000 |
| 40 | 12212 | 0.000000 | 1.000000 | 1.000000 | 0.200000 | 0.650000 | 0.150000 |
| 40 | 12221 | 0.000000 | 1.000000 | 1.000000 | 0.200000 | 0.650000 | 0.150000 |
| 40 | 12222 | 0.000000 | 1.000000 | 1.000000 | 0.200000 | 0.650000 | 0.150000 |
| 40 | 12311 | 0.000000 | 1.000000 | 1.000000 | 0.500000 | 0.200000 | 0.300000 |
| 40 | 12312 | 0.000000 | 1.000000 | 1.000000 | 0.500000 | 0.200000 | 0.300000 |
| 40 | 12321 | 0.000000 | 1.000000 | 1.000000 | 0.500000 | 0.200000 | 0.300000 |
| 40 | 12322 | 0.000000 | 1.000000 | 1.000000 | 0.500000 | 0.200000 | 0.300000 |
| 40 | 12411 | 0.000000 | 1.000000 | 1.000000 | 0.600000 | 0.200000 | 0.200000 |
| 40 | 12412 | 0.000000 | 1.000000 | 1.000000 | 0.600000 | 0.200000 | 0.200000 |
| 40 | 12421 | 0.000000 | 1.000000 | 1.000000 | 0.600000 | 0.200000 | 0.200000 |
| 40 | 12422 | 0.000000 | 1.000000 | 1.000000 | 0.600000 | 0.200000 | 0.200000 |

```
       40      13111  0.000000       1.000000       1.000000       0.700000       0.100000       0.200000
       40      13112  0.000000       1.000000       1.000000       0.700000       0.100000       0.200000
       40      13121  0.000000       1.000000       1.000000       0.700000       0.100000       0.200000
       40      13122  0.000000       1.000000       1.000000       0.700000       0.100000       0.200000
       40      13211  0.000000       1.000000       1.000000       0.200000       0.650000       0.150000
       40      13212  0.000000       1.000000       1.000000       0.200000       0.650000       0.150000
       40      13221  0.000000       1.000000       1.000000       0.200000       0.650000       0.150000
       40      13222  0.000000       1.000000       1.000000       0.200000       0.650000       0.150000
       40      13231  0.000000       1.000000       1.000000       0.200000       0.650000       0.150000
       40      13232  0.000000       1.000000       1.000000       0.200000       0.650000       0.150000
       40      13311  0.000000       1.000000       1.000000       0.500000       0.200000       0.300000
       40      13312  0.000000       1.000000       1.000000       0.500000       0.200000       0.300000
       40      13321  0.000000       1.000000       1.000000       0.500000       0.200000       0.300000
       40      13322  0.000000       1.000000       1.000000       0.500000       0.200000       0.300000
       40      13331  0.000000       1.000000       1.000000       0.500000       0.200000       0.300000
       40      13411  0.000000       1.000000       1.000000       0.600000       0.200000       0.200000
       40      13412  0.000000       1.000000       1.000000       0.600000       0.200000       0.200000
       40      13421  0.000000       1.000000       1.000000       0.600000       0.200000       0.200000
       40      13422  0.000000       1.000000       1.000000       0.600000       0.200000       0.200000
       40      13431  0.000000       1.000000       1.000000       0.600000       0.200000       0.200000
       40      13432  0.000000       1.000000       1.000000       0.600000       0.200000       0.200000
       40      14121  0.000000       1.000000       1.000000       0.700000       0.100000       0.200000
       40      14122  0.000000       1.000000       1.000000       0.700000       0.100000       0.200000
       40      14131  0.000000       1.000000       1.000000       0.700000       0.100000       0.200000
       40      14132  0.000000       1.000000       1.000000       0.700000       0.100000       0.200000
       40      14221  0.000000       1.000000       1.000000       0.200000       0.650000       0.150000
       40      14222  0.000000       1.000000       1.000000       0.200000       0.650000       0.150000
       40      14231  0.000000       1.000000       1.000000       0.200000       0.650000       0.150000
       40      14232  0.000000       1.000000       1.000000       0.200000       0.650000       0.150000
       40      14321  0.000000       1.000000       1.000000       0.500000       0.200000       0.300000
       40      14322  0.000000       1.000000       1.000000       0.500000       0.200000       0.300000
       40      14331  0.000000       1.000000       1.000000       0.500000       0.200000       0.300000
       40      14332  0.000000       1.000000       1.000000       0.500000       0.200000       0.300000
       40      14421  0.000000       1.000000       1.000000       0.600000       0.200000       0.200000
       40      14422  0.000000       1.000000       1.000000       0.600000       0.200000       0.200000
       40      14431  0.000000       1.000000       1.000000       0.600000       0.200000       0.200000
       40      14432  0.000000       1.000000       1.000000       0.600000       0.200000       0.200000
       40      15121  0.000000       1.000000       1.000000       0.700000       0.100000       0.200000
       40      15122  0.000000       1.000000       1.000000       0.700000       0.100000       0.200000
       40      15131  0.000000       1.000000       1.000000       0.700000       0.100000       0.200000
       40      15132  0.000000       1.000000       1.000000       0.700000       0.100000       0.200000
       40      15221  0.000000       1.000000       1.000000       0.200000       0.650000       0.150000
       40      15222  0.000000       1.000000       1.000000       0.200000       0.650000       0.150000
       40      15231  0.000000       1.000000       1.000000       0.200000       0.650000       0.150000
       40      15232  0.000000       1.000000       1.000000       0.200000       0.650000       0.150000
       40      15321  0.000000       1.000000       1.000000       0.500000       0.200000       0.300000
       40      15322  0.000000       1.000000       1.000000       0.500000       0.200000       0.300000
       40      15331  0.000000       1.000000       1.000000       0.500000       0.200000       0.300000
       40      15332  0.000000       1.000000       1.000000       0.500000       0.200000       0.300000
       40      15421  0.000000       1.000000       1.000000       0.600000       0.200000       0.200000
       40      15422  0.000000       1.000000       1.000000       0.600000       0.200000       0.200000
       40      15431  0.000000       1.000000       1.000000       0.600000       0.200000       0.200000
       40      15432  0.000000       1.000000       1.000000       0.600000       0.200000       0.200000
       40      16000  0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
c--------------------------------------------------------------------------------------------
c452 GQUAL-sediment to stream mapping (read if sediment as gqual)
c
c    defid   parameter group id
c    dwqid   general quality id
c    lutype  landuse type flow id (1 = impervious surfaceflow,
c            2 = pervious surfaceflow, 3 = pervious interflow, 4 = pervious groundflow)
c    sed_i   fraction of sediment class_i (sand, silt, and clay)
c
c defid dwqid    lutype   sed_1   sed_2   sed_3 ........sed_n
c--------------------------------------------------------------------------------------------
c453 monthly erosion-related cover values
c    only required if crvfg = 1 (see card 440)
c
c    defid   parameter group id
c    deluid  landuse id
c    jan-dec erosion-related cover values at start of each month
c
c defid deluid   jan   feb   mar   apr   may   jun   jul   aug   sep   oct   nov   dec
c------------------------------------------------------------------------------------
c454 monthly net vertical sediment input
c    only required if vsivfg = 1 (see card 440)
c
c    defid   parameter group id
c    deluid  landuse id
```

```
c    jan-dec net vertical sediment input at start of each month (lb/acre/day)
c
c defid deluid   jan   feb   mar   apr   may   jun   jul   aug   sep   oct   nov   dec
c-------------------------------------------------------------------------------
c455 sediment general parameters group 3 (read if sedfg = 1)
c    general sediment related parameters for instream transport
c
c    rgid     stream parameter group id
c    bedwid   bed width (ft) - this is constant for the entire simulation period
c    beddep   initial bed depth (ft)
c    por      porosity
c    burial   burial rate of aggregated sediment layer (in/day)
c             if burial = 0 then burial rate in card 456 is used
c
c
c rgid  bedwid  beddep  por  burial
       33     16.000000      0.250000       0.500000       0.000000
       40     16.000000      0.250000       0.500000       0.000000
c---------------------------------------------------------------------------------------
c456 sediment parameters group 4 (read if sedfg = 1)
c    cohesive suspended sediment variables for instream transport
c
c    rgid           stream parameter group id
c    sed_id         sediment class id
c    sedflg         sediment flag indicating sediment class (0 for sand, 1 for silt, and 2 for clay)
c    sedo           initial sediment conc in fluid phase (mg/liter)
c    sedfrac        initial sediment fractions (by weight) in the bed material
c    db50/d         median diameter of the non-cohesive sediment (sand) (in) (sandfg = 1 or 2)
c                   / effective diameter of the cohesive particles (silt and clay) (in)
c    w              corresponding fall velocity of the particle in still water (in/s)
c    rho            density of the particles (gm/cm^3)
c    ksand/taucd    coefficient in the sandload power function formula (sandfg = 3)
c                   / critical bed shear stress for deposition of the cohesive particle - generally taucd <=
taucs (lb/ft^2)
c                   if tau > taucd then no deposition
c                   if tau < taucd then deposition rate approaches settling velocity, w
c    expsnd/taucs   exponent in the sandload power function formula (sandfg = 3)
c                   / critical bed shear stress for scour of the cohesive particle (lb/ft^2)
c                   if tau < taucs then no scour
c                   if tau > taucs then scour steadily increases
c    m              erodibility coefficient of the cohesive particle (lb/ft^2/day)
c    burial         burial rate of the sediment particle (in/day)
c                   it is used if burial rate in card 455 is zero
c
c
c rgid  sed_id  sedflg sedo  sedfrac  db50/d   w  rho  ksand/taucd  expsnd/taucs  m   burial
       33     1      0      0.000000       0.100000       0.010000       0.800000       2.500000
       0.100000       2.000000       0.000000       0.000000
       33     2      1      0.000000       0.700000       0.000600       0.000500       2.200000
       0.104427       0.292396       0.010000       0.000000
       33     3      2      0.000000       0.200000       0.000100       0.000050       2.000000
       0.020885       0.187969       0.050000       0.000000
       40     1      0      0.000000       0.100000       0.010000       0.800000       2.500000
       0.100000       2.000000       0.000000       0.000000
       40     2      1      0.000000       0.700000       0.000600       0.000500       2.200000
       0.016708       0.125311       0.010000       0.000000
       40     3      2      0.000000       0.200000       0.000100       0.000050       2.000000
       0.008354       0.062655       0.050000       0.000000
c---------------------------------------------------------------------------------------
c457 Streambank erosion sediment parameters (read if sedfg = 1 and sedber = 1)
c
c    rchid   reach id
c    lber    erodible stream length (miles)
c    kber    coefficient for scour of the bank matrix soil (calibration)
c    jber    exponent for scour of the bank matrix soil (calibration)
c    qber    bank erosion flow threshold causing channel bank soil erosion (cfs)
c            if = negative then threshold flow is at the bank full depth (cfs)
c    potNH4  particulate NH4-N bank erosion potency factor for RQUAL (lb/ton-sediment)
c    potPO4  particulate PO4-P bank erosion potency factor for RQUAL (lb/ton-sediment)
c    sed_i   fraction of sediment class_i (sand, silt, and clay)
c
c rchid    lber    kber    jber    qber   potNH4   potPO4   sed_1   sed_2   sed_3 ....sed_n
c---------------------------------------------------------------------------------------
c460 soil temperature control   (read if tempfg = 1)
c
c    msltfg  if = 1 monthly vary aslt and bslt parameters in surface flow temperature calculation
c    miftfg  if = 1 monthly vary aift and bift parameters in interflow temperature calculation
c    mgwtfg  if = 1 monthly vary agwt and bgwt parameters in ground water temperature calculation
c
```

```
c msltfg     miftfg      mgwtfg
c--------------------------------------------------------------------------------------------
c461 Soil Temperature   (read if tempfg =1)
c
c    defid   parameter group id
c    deluid  landuse id
c    tsopfg  if = 0 compute subsurface temperatures using a mean departure from air temperature plus a smoothing
factor
c            if = 1 compute subsurface temperature using regression
c            if = 2 the lower/gw layer temperature is a function of upper layer temperature instead of air
temperature
c    aslt    surface layer temperature when the air temperature 0 degrees C
c    bslt    slope of the surface layer temperature regression equation
c    aift    mean difference between interflow temperature and air temperature (C)
c    bift    smoothing factor in the interflow temperature calculation
c    agwt    mean difference between groundwater temperature and air temperature (C)
c    bgwt    smoothing factor in the groundwater temperature calculation
c    islt    initial surface flow temperature (C)
c    iift    initial interflow temperature (C)
c    igwt    initial groundwater temperature (C)
c
c            y = a + b * x
c defid deluid   tsopfg    aslt     bslt     aift     bift     agwt   bgwt  islt   iift   igwt
c--------------------------------------------------------------------------------------------
c462 mon-aslt
c    only required if tempfg = 1 and msltfg = 1 (see card 460)
c
c    defid   parameter group id
c    deluid  landuse id
c    jan-dec surface layer temperature when the air temperature 0 degrees C at start of each month (C)
c
c defid deluid   jan   feb   mar   apr   may   jun   jul   aug   sep   oct   nov   dec
c------------------------------------------------------------------------------------
c463 mon-bslt
c    only required if tempfg = 1 and msltfg = 1 (see card 460)
c
c    defid   parameter group id
c    deluid  landuse id
c    jan-dec slope of the surface layer temperature regression equation at start of each month
c
c defid deluid   jan   feb   mar   apr   may   jun   jul   aug   sep   oct   nov   dec
c------------------------------------------------------------------------------------
c464 mon-aift
c    only required if tempfg = 1 and miftfg = 1 (see card 460)
c
c    defid   parameter group id
c    deluid  landuse id
c    jan-dec mean difference between interflow temperature and air temperature at start of each month (C)
c
c defid deluid   jan   feb   mar   apr   may   jun   jul   aug   sep   oct   nov   dec
c------------------------------------------------------------------------------------
c465 mon-bift
c    only required if tempfg = 1 and miftfg = 1 (see card 460)
c
c    defid   parameter group id
c    deluid  landuse id
c    jan-dec smoothing factor in the interflow temperature calculation at start of each month
c
c defid deluid   jan   feb   mar   apr   may   jun   jul   aug   sep   oct   nov   dec
c------------------------------------------------------------------------------------
c466 mon-agwt
c    only required if tempfg = 1 and mgwtfg = 1 (see card 460)
c
c    defid   parameter group id
c    deluid  landuse id
c    jan-dec mean difference between groundwater temperature and air temperature at start of each month (C)
c
c defid deluid   jan   feb   mar   apr   may   jun   jul   aug   sep   oct   nov   dec
c------------------------------------------------------------------------------------
c467 mon-bgwt
c    only required if tempfg = 1 and mgwtfg = 1 (see card 460)
c
c    defid   parameter group id
c    deluid  landuse id
c    jan-dec smoothing factor in the groundwater temperature calculation at start of each month
c
c defid deluid   jan   feb   mar   apr   may   jun   jul   aug   sep   oct   nov   dec
c------------------------------------------------------------------------------------
c470 Temperature Parameters for Land Groups  (read if tempfg =1)
```

```
c
c    subbasin    subbasin id
c    melev     the mean watershed elevation (ft)
c    eldat       difference in elevation between watershed and the air temperature gage (ft)
c    rmelev      the mean RCHRES elevation (ft)
c    reldat      difference in elevation between the RCHRES and the air temperature gage (ft)
c                (positive if RCHRES is higher than the gage).
c
c subbasin   melev     eldat   rmelev     reldat
c--------------------------------------------------------------------------------------------
c474 24-hourly dry lapse rates (read if tempfg = 1)
c
c    12AM-11PM  lapse_rate - dry period lapse rate varying between 0.0035 to 0.005 (degree F/ft)
c
c   12AM   1AM   2AM   3AM   4AM   5AM   6AM   7AM   8AM   9AM   10AM   11AM 12PM   1PM   2PM   3PM   4PM   5PM
6PM   7PM   8PM   9PM   10PM   11PM
c--------------------------------------------------------------------------------------------
c475 Temperature Parameters for Stream Groups  (read if tempfg =1)
c
c    rgid    stream parameters group id
c    cfsaex  correction factor for solar radiation; fraction of RCHRES surface exposed to radiation
c    katrad  longwave radiation coefficient
c    kcond   conduction-convection heat transport coefficient
c    kevap   evaporation coefficient
c
c rgid   cfsaex    katrad     kcond     kevap
c--------------------------------------------------------------------------------------------
c480 Bed Heat Conduction Parameters for Stream Groups  (read if tempfg=1)
c
c    rgid    stream parameters group id
c    preflg  flag for heat transfer rates for water surface (0 = off)
c    bedflg  bed conduction flag
c            0 - bed conduction is not simulated
c            1 - single interface (water-mud) heat transfer method
c            2 - two-interface (water-mud and mud-ground) heat transfer method
c            3 - Jobson method (not supported)
c    tgflg   source of the ground temperature for the bed conduction (used when bedflg is 1 or 2)
c            1 - time series (not supported)
c            2 - single value
c            3 - monthly values (card 485)
c    muddep  depth of the mud layer in the two-interface model (bedflg = 2) (m)
c    tgrnd   constant (tgflg = 2) ground temperature (bedflg = 1 or 2) (degree C)
c    kmud    heat conduction coefficient between water and the mud/ground (bedflg = 1 or 2) (kcal/m2/degC/hr)
c    kgrnd   heat conduction coefficient between ground and mud in the two-interface model (bedflg = 2)
(kcal/m2/degC/hr)
c
c rgid   preflg   bedflg   tgflg   muddep   tgrnd   kmud   kgrnd
c--------------------------------------------------------------------------------------------
c485 monthly ground temperatures for bed heat conduction algorithms
c    only required if tgflg = 3 (see card 480)
c
c    rgid     stream parameter group id
c    jan-dec  tgrndm - monthly ground temperatures for use in the bed heat conduction models (degree C)
c
c  rgid jan   feb   mar   apr   may   jun   jul   aug   sep   oct   nov   dec
c--------------------------------------------------------------------------------------------
c500 land to stream mapping (read if oxfg =1)
c
c    deluid  landuse id
c    dwqid   general quality id
c    lutype  landuse type flow id (1 = impervious surfaceflow,
c            2 = pervious surfaceflow, 3 = pervious interflow, 4 = pervious groundflow)
c    bod     bod fraction in pqual
c    nox     nitrate fraction in pqual
c    tam     total ammonia fraction in  pqual
c    snh4    particulate NH4-N fraction in pqual
c    po4     ortho-phosphorus fraction in pqual
c    spo4    particulate PO4-P fraction in pqual
c    orn     organic-nitrogen fraction in pqual
c    orp     organic-phosphorus fraction in pqual
c    orc     organic-carbon fraction in pqual
c
c deluid    dwqid    lutype   bod   nox   tam   snh4   po4   spo4   orn   orp   orc
c--------------------------------------------------------------------------------------------
c501 atmosphere to stream mapping
c
c    only required if adfgrch = 1 (see card 280)
c
c    rgid    stream parameter group ID
```

```
c    dwqid   general quality ID
c    bod     bod fraction in PQUAL
c    nox     nitrate fraction in PQUAL
c    tam     total ammonia fraction in PQUAL
c    po4     orthophosphate fraction in PQUAL
c    orn     organic-nitrogen fraction in PQUAL
c    orp     organic-phosphorus fraction in PQUAL
c    orc     organic-carbon fraction in PQUAL
c
c rgid  dwqid  bod  nox  tam  po4  orn  orp  orc
c--------------------------------------------------------------------------------------------
c502 gases control   (read if oxfg =1)
c
c    midofg  if = 1 monthly very DO concentration in interflow
c    mico2fg if = 1 monthly very CO2 concentration in interflow
c    madofg  if = 1 monthly very DO concentration in ground water
c    maco2fg if = 1 monthly very CO2 concentration in ground water
c
c midofg     mico2fg      madofg      maco2fg
c--------------------------------------------------------------------------------------------
c503   DO-CO2 Control constant values (read if oxfg =1)
c
c    defid   parameter group id
c    deluid  landuse id
c    sdoxp   concentration of dissolved oxygen in surface flow (mg/l)
c    sco2p   concentration of dissolved CO2 in surface flow (mg/l)
c    idoxp   concentration of dissolved oxygen in interflow outflow (mg/l)
c    ico2p   concentration of dissolved CO2 in interflow outflow (mg/l)
c    adoxp   concentration of dissolved oxygen in active groundwater outflow (mg/l)
c    aco2p   concentration of dissolved CO2 in active groundwater outflow (mg/l)
c
c defid deluid   sdoxp    sco2p     idoxp    ico2p     adoxp    aco2p
c--------------------------------------------------------------------------------------------
c504 mon-DO (interflow)  mg C/l
c    only required if oxfg = 1 and midofg = 1 (see card 502)
c
c    defid   parameter group id
c    deluid  landuse id
c    jan-dec interflow dissolved oxygen concentration at start of each month (mg/l)
c
c defid deluid   jan   feb   mar   apr   may   jun   jul   aug   sep   oct   nov   dec
c------------------------------------------------------------------------------------
c505 mon-DO (groundwater)
c    only required if oxfg = 1 and madofg = 1 (see card 502)
c
c    defid   parameter group id
c    deluid  landuse id
c    jan-dec groundwater dissolved oxygen concentration at start of each month (mg/l)
c
c defid deluid   jan   feb   mar   apr   may   jun   jul   aug   sep   oct   nov   dec
c------------------------------------------------------------------------------------
c506 mon-CO2 (interflow)  mg C/l
c    only required if oxfg = 1 and mico2fg = 1 (see card 502)
c
c    defid   parameter group id
c    deluid  landuse id
c    jan-dec interflow carbon dioxide concentration at start of each month (mg/l)
c
c defid deluid   jan   feb   mar   apr   may   jun   jul   aug   sep   oct   nov   dec
c--------------------------------------------------------------------------------------------
c507 mon-CO2 (groundwater)
c    only required if oxfg = 1 and maco2fg = 1 (see card 502)
c
c    defid   parameter group id
c    deluid  landuse id
c    jan-dec groundwater carbon dioxide concentration at start of each month (mg/l)
c
c defid deluid   jan   feb   mar   apr   may   jun   jul   aug   sep   oct   nov   dec
c--------------------------------------------------------------------------------------------
c510 DO/BOD control
c
c    benrfg   benthic release flag (for benthic related parameters)
c    reamfg reaeration flag (indicates the method used to calculate the reaeration coefficient for free-flowing
streams)
c    if = 1 then Tsivoglou method is used
c    if = 2 then Owens, Churchill, or O'Connor-Dobbins method is used depending on velocity and depth of water
c    if = 3 then Coefficient is calculated as a power function of velocity and/or depth
c
c benrfg     reamfg
```

```
c--------------------------------------------------------------------------------------------
c511 ox-parm1
c
c    rgid    stream parameter group id
c    kbod20  bod decay rate at 20oC (1/hr)
c    tcbod   temperature adjustment coefficient for bod decay
c    kodset  bod settling rate (m/hr)
c    supsat  maximum allowable dissolved oxygen supersaturation (expressed as a multiple of the dissolved oxygen
saturation concentration)
c    tcginv  temperature correction coefficient for surface gas invasion
c    reak    empirical constant in the equation
c            if reamfg = 1 then it is an escape coefficient (1/ft)
c            if reamfg = 3 then it is used to calculate the reaeration coefficient (1/hr)
c    expred  exponent to depth in the reaeration coefficient equation (for reamfg = 3)
c    exprev  exponent to velocity in the reaeration coefficient equation (for reamfg = 3)
c    cforea  correction factor in the lake reaeration equation; it accounts for good or poor circulation
characteristics
c
c rgid   kbod20   tcbod   kodset   supsat   tcginv   reak   expred   exprev   cforea
c--------------------------------------------------------------------------------------------
c512 ox-parm2
c
c    rgid       stream parameter group id
c    benod      benthal oxygen demand at 20 degrees C (with unlimited DO concentration) (mg/m2/hr)
c    tcben      temperature correction coefficient for benthal oxygen demand
c    expod      exponential factor in the dissolved oxygen term of the benthal oxygen demand equation
c    brbod      benthal release rate of BOD under aerobic conditions.(mg/m2/hr)
c    brbod_inc  increment to benthal release of BOD under anaerobic conditions. (mg/m2/hr)
c    expre1     the exponent in the DO term of the benthal BOD release equation
c
c rgid   benod   tcben   expod   brbod   brbod_inc   exprel
c------------------------------------------------------------------------------------
c513 oxrx-initial conditions
c
c    rgid   stream parameter group id
c    dox    DO initial condition. (mg/l)
c    bod    BOD initial condition in water column. (mg/l)
c    satdo  Initial DO saturation concentration. (mg/l)
c
c rgid   dox   bod   satdo
c------------------------------------------------------------------------------------
c514 ox-scour parms
c
c    rgid   stream parameter group id
c    scrvel threshold velocity above which the effect of scouring on benthal release rates is considered. (m/s)
c    scrmul multiplier by which benthal releases are increased during scouring.
c
c rgid   scrvel   scrmul
c------------------------------------------------------------------------------------
c520 nutrients control
c
c    tamfg    total ammonia flag
c    no2fg    nitrite flag
c    po4fg    ortho-phosphorus flag
c    amvfg    ammonia volatilization flag
c    denfg    denitrification flag
c    adnhfg   NH4 adsorption flag
c    adpofg   PO4 adsorption flag
c    mphfg    monthly pH flag (not supported in this version)
c
c tamfg   no2fg   po4fg   amvfg   denfg   adnhfg   adpofg   mphfg
c--------------------------------------------------------------------------------------------
c521 nut-parm1
c
c    rgid    stream parameter group id
c    cvbo    conversion from milligrams biomass to milligrams oxygen (mg/mg)
c    cvbpc   conversion from biomass expressed as phosphorus to carbon (mols/mol)
c    cvbpn   conversion from biomass expressed as phosphorus to nitrogen (mols/mol)
c    bpcntc  percentage of biomass which is carbon (by weight)
c    ktam20  nitrification rate of ammonia at 20 degrees C (1/hr)
c    kno220  nitrification rate of nitrite at 20 degrees C (1/hr)
c    tcnit   temperature correction coefficient for nitrification
c    kno320  nitrate denitrification rate at 20 degrees C (1/hr)
c    tcden   temperature correction coefficient for denitrification
c    denoxt  dissolved oxygen concentration threshold for denitrification (mg/l)
c
c rgid   cvbo   cvbpc   cvbpn  bpcntc   ktam20  kno220  tcnit  kno320  tcden  denoxt
c--------------------------------------------------------------------------------------------
c522 nut-parm2
```

```
c
c    rgid         stream parameter group id
c    brtam_1      benthal release rate of ammonia under aerobic condition (mg/m2/hr)
c    brtam_2      benthal release rates of ammonia under anaerobic conditions (mg/m2/hr)
c    brpo4_1      benthal release rate of ortho-phosphorus under aerobic condition (mg/m2/hr)
c    brpo4_2      benthal release rate of ortho-phosphorus under anaerobic condition (mg/m2/hr)
c    bnh4(1-3)    constant bed concentrations of ammonia-N adsorbed to sand, silt, and clay (mg/kg)
c    bpo4(1-3)    constant bed concentrations of ortho-phosphorus-P adsorbed to sand, silt, and clay (mg/kg)
c
c rgid   brtam_1   brtam_2   brpo4_1   brpo4_2   bnh4_1   bnh4_2   bnh4_3    bpo4_1   bpo4_2   bpo4_3
c------------------------------------------------------------------------------------
c523 nut-parm3
c
c    rgid         stream parameter group id
c    anaer        concentration of dissolved oxygen below which anaerobic conditions are assumed to exist (mg/l)
c    adnhpm(1-3)  adsorption coefficients (Kd) for ammonia-N adsorbed to sand, silt, and clay (cm3/g)
c    adpopm(1-3)  adsorption coefficients for ortho-phosphorus-P adsorbed to sand, silt, and clay (cm3/g)
c    expnvg       exponent in the gas layer mass transfer coefficient equation for NH3 volatilization
c    expnvl       exponent in the liquid layer mass transfer coefficient equation for NH3 volatilization
c
c rgid  anaer    adnhpm_1   adnhpm_2   adnhpm_3   adpopm_1   adpopm_2   adpopm_3   expnvg   expnvl
c------------------------------------------------------------------------------------
c524 nut-initial conditions
c
c    rgid       stream parameter group id
c    no3        initial concentration of nitrate (mg/l)
c    tam        initial concentration of total ammonia (mg/l)
c    no2        initial concentration of nitrite (as N) (mg/l)
c    po4        initial concentration of ortho-phosphorus (as P) (mg/l)
c    snh4(1-3)  initial suspended concentrations of ammonia-N adsorbed to sand, silt, and clay (mg/kg)
c    spo4(1-3)  initial suspended concentrations of ortho-phosphorus-P adsorbed to sand, silt, and clay (mg/kg)
c
c rgid   no3   tam   no2   po4   snh4_1   snh4_2   snh4_3   spo4_1   spo4_2   spo4_3
c------------------------------------------------------------------------------------
c530 plank flags
c
c    phyfg    phytoplankton flag
c    zoofg    zooplankton flag
c    balfg    benthic algae flag
c    sdltfg   influence of sediment washload on light extinction flag
c    amrfg    ammonia retardation of nitrogen-limited growth flag
c    decfg    linkage between carbon dioxide and phytoplankton growth flag (if on, the linkage is decoupled)
c    nsfg     ammonia is included as part of available nitrogen supply in nitrogen limited growth calculations
c    orefg    indicates the oref parameter in card 534 as a flowrate (if = 0) otherwise velocity
c
c phyfg   zoofg   balfg   sdltfg   amrfg   decfg   nsfg   orefg
c--------------------------------------------------------------------------------------------
c531 plank-parm1
c
c    rgid    stream parameter group id
c    ratclp  ratio of chlorophyll A content of biomass to phosphorus content
c    nonref  non-refractory fraction of algae and zooplankton biomass
c    litsed  multiplication factor to total sediment concentration to determine sediment contribution to light
extinction (l/mg/ft)
c    alnpr   fraction of nitrogen requirements for phytoplankton growth that is satisfied by nitrate
c    extb    base extinction coefficient for light (1/m)
c    malgr   maximum unit algal growth rate (1/hr)
c
c rgid    ratclp   nonref   litsed   alnpr   extb    malgr
c--------------------------------------------------------------------------------------------
c532 plank-parm2
c
c    rgid    stream parameter group id
c    cmmlt   Michaelis-Menten constant for light limited growth (lay/min)
c    cmmn    nitrate Michaelis-Menten constant for nitrogen limited growth (mg/l)
c    cmmnp   nitrate Michaelis-Menten constant for phosphorus limited growth (mg/l)
c    cmmp    phosphate Michaelis-Menten constant for phosphorus limited growth (mg/l)
c    talgrh  temperature above which algal growth ceases (C)
c    talgrl  temperature below which algal growth ceases (C)
c    talgrm  temperature below which algal growth is retarded (C)
c
c rgid    cmmlt    cmmn    cmmnp    cmmp    talgrh   talgrl   talgrm
c------------------------------------------------------------------------------------
c533 plank-parm3
c
c    rgid   stream parameter group id
c    alr20  algal unit respiration rate at 20 degrees C (1/hr)
c    aldh   high algal unit death rate (1/hr)
c    aldl   low algal unit death rate (1/hr)
```

```
c    oxald  increment to phytoplankton unit death rate due to anaerobic conditions (1/hr)
c    naldh  inorganic nitrogen concentration below which high algal death rate occurs (as nitrogen) (mg/l)
c    paldh  inorganic phosphorus concentration below which high algal death rate occurs (as phosphorus) (mg/l)
c
c rgid     alr20      aldh      aldl     oxald     naldh     paldh
c------------------------------------------------------------------------------------
c534 plank-parm4
c
c    rgid    stream parameter group id
c    phycon  constant inflow concentration of plankton from land to reach (mg/l)
c    seed    minimum concentration of plankton not subject to advection (i.e., at high flow) (mg/l)
c    mxstay  concentration of plankton not subject to advection at very low flow (mg/l)
c    oref    velocity/outflow at which the concentration of plankton not subject to advection is midway between
SEED and MXSTAY, see card 530 (m/s or m3/s)
c    claldh  chlorophyll a concentration above which high algal death rate occurs (ug/l)
c    physet  phytoplankton settling rate (m/hr)
c    refset  settling rate for dead refractory organics (m/hr)
c    cfsaex  This factor is used to adjust the input solar radiation to make it applicable to the RCHRES;
c            for example, to account for shading of the surface by trees or buildings
c    mbal    maximum benthic algae density (as biomass) (mg/m2)
c    cfbalr  ratio of benthic algal to phytoplankton respiration rate
c    cfbalg  ratio of benthic algal to phytoplankton growth rate
c
c rgid   phycon   seed   mxstay   oref   claldh   physet   refset  cfsaex  mbal   cfbalr   cfbalg
c------------------------------------------------------------------------------------
c535 plank-initial conditions
c
c    rgid   stream parameter group id
c    phyto  initial phytoplankton concentration, as biomass (mg/l)
c    benal  initial benthic algae density, as biomass (mg/m2)
c    orn    initial dead refractory organic nitrogen concentration (mg/l)
c    orp    initial dead refractory organic phosphorus concentration (mg/l)
c    orc    initial dead refractory organic carbon concentration (mg/l)
c
c rgid    phyto    benal   orn    orp    orc
c------------------------------------------------------------------------------------
c540 pH controls
c
c    phffg1   value of 0 indicates that the removal factor for total inorganic carbon is constant, given as
phfrc1
c    a value of 1 indicates the monthly removal factors
c    phffg2   value of 0 indicates that the removal factor for dissolved carbon dioxide is constant, given as
phfrc2
c             a value of 1 indicates the monthly removal factors
c    phfrc1   removal fraction for total inorganic carbon
c    phfrc2   removal fraction for dissolved carbon dioxide
c
c phffg1   phffg2   phfrc1   phfrc2
c--------------------------------------------------------------------------------------------
c541 pH-parm
c
c    rgid    stream parameter group id
c    phcnt maximum number of iterations used to solve for the pH
c    alkcon number of the conservative substance which is used to simulate alkalinity
c            Alkalinity must be simulated in order to obtain valid results
c    cfcinv ratio of the carbon dioxide invasion rate to the oxygen reaeration rate
c    brco2_1 benthal release rate of CO2 (as carbon) for aerobic conditions (mg/m2/hr)
c    brco2_2 benthal release rate of CO2 (as carbon) for anaerobic conditions (mg/m2/hr)
c
c rgid    phcnt   alkcon   cfcinv   brco2_1   brco2_2
c--------------------------------------------------------------------------------------------
c542 pH-initial conditions
c
c    rgid stream parameter group id
c    tic  initial total inorganic carbon (mg/l)
c    co2  initial carbon dioxide (as carbon) (mg/l)
c    ph  initial pH
c
c rgid    tic    co2   ph
c------------------------------------------------------------------------------------
c543 mon-tic (monthly removal fraction for total inorganic carbon)
c    only required if phfg = 1 and phffg1 = 1 (see card 502 and card 540)
c
c    rgid    stream parameter group id
c    jan-dec total inorganic carbon removal fraction at the start of each month
c
c  rgid jan   feb   mar   apr   may   jun   jul   aug   sep   oct   nov   dec
c--------------------------------------------------------------------------------------------
c544 mon-co2 (monthly removal fraction for dissolved carbon dioxide)
```

```
c    only required if phfg = 1 and phffg2 = 1 (see card 502 and card 540)
c
c    rgid    stream parameter group id
c    jan-dec dissolved carbon dioxide removal fraction at the start of each month
c
c  rgid jan   feb   mar   apr   may   jun   jul   aug   sep   oct   nov   dec
c---------------------------------------------------------------------------------------------
c600 TMDL control flags
c
c    ncpt        if > 0 then use point sources control card 660
c    ncland      if > 0 then use landuse control card 670
c                if = 1 then apply reduction to only surface output
c                if = 2 then apply reduction to total land output
c    ncrch       if > 0 then use reach control card 685 and 690
c    ntrgp       number of threshold groups in Card 410 and 610
c    ntnum       number of defined thresholds for analysis
c                if > 0 then use threshold control cards 605 and 610
c
c   ncpt  ncland  ncrch  ntrgp  ntnum
        0      2      0      1      1
c---------------------------------------------------------------------------------------------
c605 TMDL threshold mapping (used if ntnum > 0 in card 600)
c
c    tnum       threshold ordinal number
c    tqsd       threshold qual (1 for dissolved only and 2 for total)
c    tcount     number of water quality constituent to aggregate
c    tqid       list of tqid to aggregate - number of tqid in list = tcount (GQUAL/RQUAL IDs)
c
c    tnum   tqsd    tcount   tqid1   tqid2   .......   tqidn
        1      2      1      100
c---------------------------------------------------------------------------------------------
c610 TMDL threshold definitions (used if ntnum > 0 in card 600)
c
c    trgid      threshold reach group ID (corresponds to trgid on Card 410)
c    tnum       threshold number (corresponds to tnum on Card 605)
c    ttype      threshold type (possible values: 0, 1, 2, 3 or -1, -2, -3)
c                0 = no standard to be applied for the trgid
c                1 = instantaneous values > threshold
c                2 = arithmetic mean > threshold
c                3 = geometric mean > threshold
c               -1 = instantaneous values < threshold
c               -2 = arithmetic mean < threshold
c               -3 = geometric mean < threshold
c    tdays      number of days over model output is aggregated and/or is compared
c               if tdays = 0 then threshold becomes percent of time
c    jan-dec    twelve monthly values for threshold (for constant, use same value 12 times)
c               (units are same as in card 250)
c
c    examples: ttype  tdays  description/interpretation
c                 1      1  at least one instantaneous value within a 1-day running period > threshold
c                -1      1  at least one instantaneous value within a 1-day running period < threshold
c                 1      0  percent of time that instantaneous value > threshold
c                 2      4  4-day running arithmetic mean > threshold
c                 3     30  30-day running geometric mean > threshold (for previous 30-days)
c
c  trgid  tnum   ttype  tdays   jan   feb   mar   apr   may   jun   jul   aug   sep   oct   nov   dec
        1      1      1      0      0.000000       0.000000       0.000000       0.000000       0.000000
       0.000000       0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
c--------------------------------------------------------------------------------------
c660 TMDL point source control (used if ncpt > 0 on card 600)
c
c    rchid         reach id
c    permit        point source index (level1)
c    pipe          point source index qualifier (level2)
c    reduction     reduction of pollutant from point source (in fraction)
c
c   rchid   permit   pipe   reduction_flow...reduction_qual1...reduction_qual2...reduction_qualn
c---------------------------------------------------------------------------------------------
c670 TMDL land-based control (used if ncland > 0 on card 600)
c
c    subbasin   subwatershed id
c    deluid     land use id
c    luname     land use name
c    reduction  reduction of pollutant from corresponding landuse and subwatershed
c
c subbasin  deluid pluname  reduction
       6665   1000   Road_Freeway-All-All-All      0.000000       0.000000       0.000000       0.000000
       0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
```

```
6665   2000    Road_Primary-All-All-All      0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6665   3000    Road_Minor-All-All-All 0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6665   4000    Dev_ResHigh-All-All-All       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6665   5000    Dev_ResLow-All-All-All 0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6665   6000    Dev_Com-All-All-All    0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6665   7000    Dev_Ind-All-All-All    0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6665   8000    Dev_Inst-All-All-All   0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6665   9000    Dev_Roof-All-All-All   0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6665   10000   Dev_Overspray-All-All-All     0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6665   11111   Dev_Irrigated-A-Low-Confined  0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6665   11112   Dev_Irrigated-A-Low-Unconfined        0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6665   11121   Dev_Irrigated-A-Med-Confined  0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6665   11122   Dev_Irrigated-A-Med-Unconfined        0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6665   11211   Dev_Irrigated-B-Low-Confined  0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6665   11212   Dev_Irrigated-B-Low-Unconfined        0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6665   11221   Dev_Irrigated-B-Med-Confined  0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6665   11222   Dev_Irrigated-B-Med-Unconfined        0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6665   11311   Dev_Irrigated-C-Low-Confined  0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6665   11312   Dev_Irrigated-C-Low-Unconfined        0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6665   11321   Dev_Irrigated-C-Med-Confined  0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6665   11322   Dev_Irrigated-C-Med-Unconfined        0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6665   11411   Dev_Irrigated-D-Low-Confined  0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6665   11412   Dev_Irrigated-D-Low-Unconfined        0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6665   11421   Dev_Irrigated-D-Med-Confined  0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6665   11422   Dev_Irrigated-D-Med-Unconfined        0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6665   12111   Dev_Pervious-A-Low-Confined   0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6665   12112   Dev_Pervious-A-Low-Unconfined 0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6665   12121   Dev_Pervious-A-Med-Confined   0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6665   12122   Dev_Pervious-A-Med-Unconfined 0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6665   12211   Dev_Pervious-B-Low-Confined   0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6665   12212   Dev_Pervious-B-Low-Unconfined 0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6665   12221   Dev_Pervious-B-Med-Confined   0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6665   12222   Dev_Pervious-B-Med-Unconfined 0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6665   12311   Dev_Pervious-C-Low-Confined   0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6665   12312   Dev_Pervious-C-Low-Unconfined 0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6665   12321   Dev_Pervious-C-Med-Confined   0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6665   12322   Dev_Pervious-C-Med-Unconfined 0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6665   12411   Dev_Pervious-D-Low-Confined   0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6665   12412   Dev_Pervious-D-Low-Unconfined 0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
```

```
6665    12421  Dev_Pervious-D-Med-Confined   0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6665    12422  Dev_Pervious-D-Med-Unconfined 0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6665    13111  Agriculture-A-Low-Confined    0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6665    13112  Agriculture-A-Low-Unconfined  0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6665    13121  Agriculture-A-Med-Confined    0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6665    13122  Agriculture-A-Med-Unconfined  0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6665    13211  Agriculture-B-Low-Confined    0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6665    13212  Agriculture-B-Low-Unconfined  0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6665    13221  Agriculture-B-Med-Confined    0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6665    13222  Agriculture-B-Med-Unconfined  0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6665    13231  Agriculture-B-High-Confined   0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6665    13232  Agriculture-B-High-Unconfined 0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6665    13311  Agriculture-C-Low-Confined    0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6665    13312  Agriculture-C-Low-Unconfined  0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6665    13321  Agriculture-C-Med-Confined    0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6665    13322  Agriculture-C-Med-Unconfined  0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6665    13331  Agriculture-C-High-Confined   0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6665    13411  Agriculture-D-Low-Confined    0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6665    13412  Agriculture-D-Low-Unconfined  0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6665    13421  Agriculture-D-Med-Confined    0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6665    13422  Agriculture-D-Med-Unconfined  0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6665    13431  Agriculture-D-High-Confined   0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6665    13432  Agriculture-D-High-Unconfined 0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6665    14121  Veg_Low-A-Med-Confined 0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6665    14122  Veg_Low-A-Med-Unconfined      0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6665    14131  Veg_Low-A-High-Confined       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6665    14132  Veg_Low-A-High-Unconfined     0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6665    14221  Veg_Low-B-Med-Confined 0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6665    14222  Veg_Low-B-Med-Unconfined      0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6665    14231  Veg_Low-B-High-Confined       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6665    14232  Veg_Low-B-High-Unconfined     0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6665    14321  Veg_Low-C-Med-Confined 0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6665    14322  Veg_Low-C-Med-Unconfined      0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6665    14331  Veg_Low-C-High-Confined       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6665    14332  Veg_Low-C-High-Unconfined     0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6665    14421  Veg_Low-D-Med-Confined 0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6665    14422  Veg_Low-D-Med-Unconfined      0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6665    14431  Veg_Low-D-High-Confined       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6665    14432  Veg_Low-D-High-Unconfined     0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
```

```
6665    15121   Veg_High-A-Med-Confined        0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6665    15122   Veg_High-A-Med-Unconfined      0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6665    15131   Veg_High-A-High-Confined       0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6665    15132   Veg_High-A-High-Unconfined     0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6665    15221   Veg_High-B-Med-Confined        0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6665    15222   Veg_High-B-Med-Unconfined      0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6665    15231   Veg_High-B-High-Confined       0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6665    15232   Veg_High-B-High-Unconfined     0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6665    15321   Veg_High-C-Med-Confined        0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6665    15322   Veg_High-C-Med-Unconfined      0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6665    15331   Veg_High-C-High-Confined       0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6665    15332   Veg_High-C-High-Unconfined     0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6665    15421   Veg_High-D-Med-Confined        0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6665    15422   Veg_High-D-Med-Unconfined      0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6665    15431   Veg_High-D-High-Confined       0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6665    15432   Veg_High-D-High-Unconfined     0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6665    16000   Water-All-All-All      0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6671    1000    Road_Freeway-All-All-All       0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6671    2000    Road_Primary-All-All-All       0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6671    3000    Road_Minor-All-All-All 0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6671    4000    Dev_ResHigh-All-All-All        0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6671    5000    Dev_ResLow-All-All-All 0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6671    6000    Dev_Com-All-All-All    0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6671    7000    Dev_Ind-All-All-All    0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6671    8000    Dev_Inst-All-All-All   0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6671    9000    Dev_Roof-All-All-All   0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6671    10000   Dev_Overspray-All-All-All      0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6671    11111   Dev_Irrigated-A-Low-Confined   0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6671    11112   Dev_Irrigated-A-Low-Unconfined         0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6671    11121   Dev_Irrigated-A-Med-Confined   0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6671    11122   Dev_Irrigated-A-Med-Unconfined         0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6671    11211   Dev_Irrigated-B-Low-Confined   0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6671    11212   Dev_Irrigated-B-Low-Unconfined         0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6671    11221   Dev_Irrigated-B-Med-Confined   0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6671    11222   Dev_Irrigated-B-Med-Unconfined         0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6671    11311   Dev_Irrigated-C-Low-Confined   0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6671    11312   Dev_Irrigated-C-Low-Unconfined         0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6671    11321   Dev_Irrigated-C-Med-Confined   0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6671    11322   Dev_Irrigated-C-Med-Unconfined         0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
```

```
6671    11411  Dev_Irrigated-D-Low-Confined  0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6671    11412  Dev_Irrigated-D-Low-Unconfined        0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6671    11421  Dev_Irrigated-D-Med-Confined  0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6671    11422  Dev_Irrigated-D-Med-Unconfined        0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6671    12111  Dev_Pervious-A-Low-Confined   0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6671    12112  Dev_Pervious-A-Low-Unconfined 0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6671    12121  Dev_Pervious-A-Med-Confined   0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6671    12122  Dev_Pervious-A-Med-Unconfined 0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6671    12211  Dev_Pervious-B-Low-Confined   0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6671    12212  Dev_Pervious-B-Low-Unconfined 0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6671    12221  Dev_Pervious-B-Med-Confined   0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6671    12222  Dev_Pervious-B-Med-Unconfined 0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6671    12311  Dev_Pervious-C-Low-Confined   0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6671    12312  Dev_Pervious-C-Low-Unconfined 0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6671    12321  Dev_Pervious-C-Med-Confined   0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6671    12322  Dev_Pervious-C-Med-Unconfined 0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6671    12411  Dev_Pervious-D-Low-Confined   0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6671    12412  Dev_Pervious-D-Low-Unconfined 0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6671    12421  Dev_Pervious-D-Med-Confined   0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6671    12422  Dev_Pervious-D-Med-Unconfined 0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6671    13111  Agriculture-A-Low-Confined    0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6671    13112  Agriculture-A-Low-Unconfined  0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6671    13121  Agriculture-A-Med-Confined    0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6671    13122  Agriculture-A-Med-Unconfined  0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6671    13211  Agriculture-B-Low-Confined    0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6671    13212  Agriculture-B-Low-Unconfined  0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6671    13221  Agriculture-B-Med-Confined    0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6671    13222  Agriculture-B-Med-Unconfined  0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6671    13231  Agriculture-B-High-Confined   0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6671    13232  Agriculture-B-High-Unconfined 0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6671    13311  Agriculture-C-Low-Confined    0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6671    13312  Agriculture-C-Low-Unconfined  0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6671    13321  Agriculture-C-Med-Confined    0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6671    13322  Agriculture-C-Med-Unconfined  0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6671    13331  Agriculture-C-High-Confined   0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6671    13411  Agriculture-D-Low-Confined    0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6671    13412  Agriculture-D-Low-Unconfined  0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6671    13421  Agriculture-D-Med-Confined    0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6671    13422  Agriculture-D-Med-Unconfined  0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
```

```
6671   13431  Agriculture-D-High-Confined   0.000000       0.000000       0.000000       0.000000
0.000000      0.000000       0.000000       0.000000       0.000000       0.000000
6671   13432  Agriculture-D-High-Unconfined 0.000000       0.000000       0.000000       0.000000
0.000000      0.000000       0.000000       0.000000       0.000000       0.000000
6671   14121  Veg_Low-A-Med-Confined 0.000000       0.000000       0.000000       0.000000
0.000000      0.000000       0.000000       0.000000       0.000000       0.000000
6671   14122  Veg_Low-A-Med-Unconfined      0.000000       0.000000       0.000000       0.000000
0.000000      0.000000       0.000000       0.000000       0.000000       0.000000
6671   14131  Veg_Low-A-High-Confined       0.000000       0.000000       0.000000       0.000000
0.000000      0.000000       0.000000       0.000000       0.000000       0.000000
6671   14132  Veg_Low-A-High-Unconfined     0.000000       0.000000       0.000000       0.000000
0.000000      0.000000       0.000000       0.000000       0.000000       0.000000
6671   14221  Veg_Low-B-Med-Confined 0.000000       0.000000       0.000000       0.000000
0.000000      0.000000       0.000000       0.000000       0.000000       0.000000
6671   14222  Veg_Low-B-Med-Unconfined      0.000000       0.000000       0.000000       0.000000
0.000000      0.000000       0.000000       0.000000       0.000000       0.000000
6671   14231  Veg_Low-B-High-Confined       0.000000       0.000000       0.000000       0.000000
0.000000      0.000000       0.000000       0.000000       0.000000       0.000000
6671   14232  Veg_Low-B-High-Unconfined     0.000000       0.000000       0.000000       0.000000
0.000000      0.000000       0.000000       0.000000       0.000000       0.000000
6671   14321  Veg_Low-C-Med-Confined 0.000000       0.000000       0.000000       0.000000
0.000000      0.000000       0.000000       0.000000       0.000000       0.000000
6671   14322  Veg_Low-C-Med-Unconfined      0.000000       0.000000       0.000000       0.000000
0.000000      0.000000       0.000000       0.000000       0.000000       0.000000
6671   14331  Veg_Low-C-High-Confined       0.000000       0.000000       0.000000       0.000000
0.000000      0.000000       0.000000       0.000000       0.000000       0.000000
6671   14332  Veg_Low-C-High-Unconfined     0.000000       0.000000       0.000000       0.000000
0.000000      0.000000       0.000000       0.000000       0.000000       0.000000
6671   14421  Veg_Low-D-Med-Confined 0.000000       0.000000       0.000000       0.000000
0.000000      0.000000       0.000000       0.000000       0.000000       0.000000
6671   14422  Veg_Low-D-Med-Unconfined      0.000000       0.000000       0.000000       0.000000
0.000000      0.000000       0.000000       0.000000       0.000000       0.000000
6671   14431  Veg_Low-D-High-Confined       0.000000       0.000000       0.000000       0.000000
0.000000      0.000000       0.000000       0.000000       0.000000       0.000000
6671   14432  Veg_Low-D-High-Unconfined     0.000000       0.000000       0.000000       0.000000
0.000000      0.000000       0.000000       0.000000       0.000000       0.000000
6671   15121  Veg_High-A-Med-Confined       0.000000       0.000000       0.000000       0.000000
0.000000      0.000000       0.000000       0.000000       0.000000       0.000000
6671   15122  Veg_High-A-Med-Unconfined     0.000000       0.000000       0.000000       0.000000
0.000000      0.000000       0.000000       0.000000       0.000000       0.000000
6671   15131  Veg_High-A-High-Confined      0.000000       0.000000       0.000000       0.000000
0.000000      0.000000       0.000000       0.000000       0.000000       0.000000
6671   15132  Veg_High-A-High-Unconfined    0.000000       0.000000       0.000000       0.000000
0.000000      0.000000       0.000000       0.000000       0.000000       0.000000
6671   15221  Veg_High-B-Med-Confined       0.000000       0.000000       0.000000       0.000000
0.000000      0.000000       0.000000       0.000000       0.000000       0.000000
6671   15222  Veg_High-B-Med-Unconfined     0.000000       0.000000       0.000000       0.000000
0.000000      0.000000       0.000000       0.000000       0.000000       0.000000
6671   15231  Veg_High-B-High-Confined      0.000000       0.000000       0.000000       0.000000
0.000000      0.000000       0.000000       0.000000       0.000000       0.000000
6671   15232  Veg_High-B-High-Unconfined    0.000000       0.000000       0.000000       0.000000
0.000000      0.000000       0.000000       0.000000       0.000000       0.000000
6671   15321  Veg_High-C-Med-Confined       0.000000       0.000000       0.000000       0.000000
0.000000      0.000000       0.000000       0.000000       0.000000       0.000000
6671   15322  Veg_High-C-Med-Unconfined     0.000000       0.000000       0.000000       0.000000
0.000000      0.000000       0.000000       0.000000       0.000000       0.000000
6671   15331  Veg_High-C-High-Confined      0.000000       0.000000       0.000000       0.000000
0.000000      0.000000       0.000000       0.000000       0.000000       0.000000
6671   15332  Veg_High-C-High-Unconfined    0.000000       0.000000       0.000000       0.000000
0.000000      0.000000       0.000000       0.000000       0.000000       0.000000
6671   15421  Veg_High-D-Med-Confined       0.000000       0.000000       0.000000       0.000000
0.000000      0.000000       0.000000       0.000000       0.000000       0.000000
6671   15422  Veg_High-D-Med-Unconfined     0.000000       0.000000       0.000000       0.000000
0.000000      0.000000       0.000000       0.000000       0.000000       0.000000
6671   15431  Veg_High-D-High-Confined      0.000000       0.000000       0.000000       0.000000
0.000000      0.000000       0.000000       0.000000       0.000000       0.000000
6671   15432  Veg_High-D-High-Unconfined    0.000000       0.000000       0.000000       0.000000
0.000000      0.000000       0.000000       0.000000       0.000000       0.000000
6671   16000  Water-All-All-All      0.000000       0.000000       0.000000       0.000000
0.000000      0.000000       0.000000       0.000000       0.000000       0.000000
6673   1000   Road_Freeway-All-All-All      0.000000       0.000000       0.000000       0.000000
0.000000      0.000000       0.000000       0.000000       0.000000       0.000000
6673   2000   Road_Primary-All-All-All      0.000000       0.000000       0.000000       0.000000
0.000000      0.000000       0.000000       0.000000       0.000000       0.000000
6673   3000   Road_Minor-All-All-All 0.000000       0.000000       0.000000       0.000000
0.000000      0.000000       0.000000       0.000000       0.000000       0.000000
6673   4000   Dev_ResHigh-All-All-All       0.000000       0.000000       0.000000       0.000000
0.000000      0.000000       0.000000       0.000000       0.000000       0.000000
```

```
6673    5000   Dev_ResLow-All-All-All 0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6673    6000   Dev_Com-All-All-All    0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6673    7000   Dev_Ind-All-All-All    0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6673    8000   Dev_Inst-All-All-All   0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6673    9000   Dev_Roof-All-All-All   0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6673    10000  Dev_Overspray-All-All-All     0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6673    11111  Dev_Irrigated-A-Low-Confined  0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6673    11112  Dev_Irrigated-A-Low-Unconfined        0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6673    11121  Dev_Irrigated-A-Med-Confined  0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6673    11122  Dev_Irrigated-A-Med-Unconfined        0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6673    11211  Dev_Irrigated-B-Low-Confined  0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6673    11212  Dev_Irrigated-B-Low-Unconfined        0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6673    11221  Dev_Irrigated-B-Med-Confined  0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6673    11222  Dev_Irrigated-B-Med-Unconfined        0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6673    11311  Dev_Irrigated-C-Low-Confined  0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6673    11312  Dev_Irrigated-C-Low-Unconfined        0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6673    11321  Dev_Irrigated-C-Med-Confined  0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6673    11322  Dev_Irrigated-C-Med-Unconfined        0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6673    11411  Dev_Irrigated-D-Low-Confined  0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6673    11412  Dev_Irrigated-D-Low-Unconfined        0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6673    11421  Dev_Irrigated-D-Med-Confined  0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6673    11422  Dev_Irrigated-D-Med-Unconfined        0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6673    12111  Dev_Pervious-A-Low-Confined   0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6673    12112  Dev_Pervious-A-Low-Unconfined 0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6673    12121  Dev_Pervious-A-Med-Confined   0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6673    12122  Dev_Pervious-A-Med-Unconfined 0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6673    12211  Dev_Pervious-B-Low-Confined   0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6673    12212  Dev_Pervious-B-Low-Unconfined 0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6673    12221  Dev_Pervious-B-Med-Confined   0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6673    12222  Dev_Pervious-B-Med-Unconfined 0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6673    12311  Dev_Pervious-C-Low-Confined   0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6673    12312  Dev_Pervious-C-Low-Unconfined 0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6673    12321  Dev_Pervious-C-Med-Confined   0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6673    12322  Dev_Pervious-C-Med-Unconfined 0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6673    12411  Dev_Pervious-D-Low-Confined   0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6673    12412  Dev_Pervious-D-Low-Unconfined 0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6673    12421  Dev_Pervious-D-Med-Confined   0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6673    12422  Dev_Pervious-D-Med-Unconfined 0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6673    13111  Agriculture-A-Low-Confined    0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
```

```
6673    13112   Agriculture-A-Low-Unconfined  0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6673    13121   Agriculture-A-Med-Confined    0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6673    13122   Agriculture-A-Med-Unconfined  0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6673    13211   Agriculture-B-Low-Confined    0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6673    13212   Agriculture-B-Low-Unconfined  0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6673    13221   Agriculture-B-Med-Confined    0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6673    13222   Agriculture-B-Med-Unconfined  0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6673    13231   Agriculture-B-High-Confined   0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6673    13232   Agriculture-B-High-Unconfined 0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6673    13311   Agriculture-C-Low-Confined    0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6673    13312   Agriculture-C-Low-Unconfined  0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6673    13321   Agriculture-C-Med-Confined    0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6673    13322   Agriculture-C-Med-Unconfined  0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6673    13331   Agriculture-C-High-Confined   0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6673    13411   Agriculture-D-Low-Confined    0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6673    13412   Agriculture-D-Low-Unconfined  0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6673    13421   Agriculture-D-Med-Confined    0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6673    13422   Agriculture-D-Med-Unconfined  0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6673    13431   Agriculture-D-High-Confined   0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6673    13432   Agriculture-D-High-Unconfined 0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6673    14121   Veg_Low-A-Med-Confined 0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6673    14122   Veg_Low-A-Med-Unconfined      0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6673    14131   Veg_Low-A-High-Confined       0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6673    14132   Veg_Low-A-High-Unconfined     0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6673    14221   Veg_Low-B-Med-Confined 0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6673    14222   Veg_Low-B-Med-Unconfined      0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6673    14231   Veg_Low-B-High-Confined       0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6673    14232   Veg_Low-B-High-Unconfined     0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6673    14321   Veg_Low-C-Med-Confined 0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6673    14322   Veg_Low-C-Med-Unconfined      0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6673    14331   Veg_Low-C-High-Confined       0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6673    14332   Veg_Low-C-High-Unconfined     0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6673    14421   Veg_Low-D-Med-Confined 0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6673    14422   Veg_Low-D-Med-Unconfined      0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6673    14431   Veg_Low-D-High-Confined       0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6673    14432   Veg_Low-D-High-Unconfined     0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6673    15121   Veg_High-A-Med-Confined       0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6673    15122   Veg_High-A-Med-Unconfined     0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6673    15131   Veg_High-A-High-Confined      0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
```

```
6673    15132  Veg_High-A-High-Unconfined    0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6673    15221  Veg_High-B-Med-Confined       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6673    15222  Veg_High-B-Med-Unconfined     0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6673    15231  Veg_High-B-High-Confined      0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6673    15232  Veg_High-B-High-Unconfined    0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6673    15321  Veg_High-C-Med-Confined       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6673    15322  Veg_High-C-Med-Unconfined     0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6673    15331  Veg_High-C-High-Confined      0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6673    15332  Veg_High-C-High-Unconfined    0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6673    15421  Veg_High-D-Med-Confined       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6673    15422  Veg_High-D-Med-Unconfined     0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6673    15431  Veg_High-D-High-Confined      0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6673    15432  Veg_High-D-High-Unconfined    0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6673    16000  Water-All-All-All      0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6674    1000   Road_Freeway-All-All-All      0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6674    2000   Road_Primary-All-All-All      0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6674    3000   Road_Minor-All-All-All 0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6674    4000   Dev_ResHigh-All-All-All       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6674    5000   Dev_ResLow-All-All-All 0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6674    6000   Dev_Com-All-All-All    0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6674    7000   Dev_Ind-All-All-All    0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6674    8000   Dev_Inst-All-All-All   0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6674    9000   Dev_Roof-All-All-All   0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6674    10000  Dev_Overspray-All-All-All     0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6674    11111  Dev_Irrigated-A-Low-Confined  0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6674    11112  Dev_Irrigated-A-Low-Unconfined        0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6674    11121  Dev_Irrigated-A-Med-Confined  0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6674    11122  Dev_Irrigated-A-Med-Unconfined        0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6674    11211  Dev_Irrigated-B-Low-Confined  0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6674    11212  Dev_Irrigated-B-Low-Unconfined        0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6674    11221  Dev_Irrigated-B-Med-Confined  0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6674    11222  Dev_Irrigated-B-Med-Unconfined        0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6674    11311  Dev_Irrigated-C-Low-Confined  0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6674    11312  Dev_Irrigated-C-Low-Unconfined        0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6674    11321  Dev_Irrigated-C-Med-Confined  0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6674    11322  Dev_Irrigated-C-Med-Unconfined        0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6674    11411  Dev_Irrigated-D-Low-Confined  0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6674    11412  Dev_Irrigated-D-Low-Unconfined        0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6674    11421  Dev_Irrigated-D-Med-Confined  0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
```

```
6674    11422   Dev_Irrigated-D-Med-Unconfined       0.000000       0.000000       0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6674    12111   Dev_Pervious-A-Low-Confined   0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6674    12112   Dev_Pervious-A-Low-Unconfined 0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6674    12121   Dev_Pervious-A-Med-Confined   0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6674    12122   Dev_Pervious-A-Med-Unconfined 0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6674    12211   Dev_Pervious-B-Low-Confined   0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6674    12212   Dev_Pervious-B-Low-Unconfined 0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6674    12221   Dev_Pervious-B-Med-Confined   0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6674    12222   Dev_Pervious-B-Med-Unconfined 0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6674    12311   Dev_Pervious-C-Low-Confined   0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6674    12312   Dev_Pervious-C-Low-Unconfined 0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6674    12321   Dev_Pervious-C-Med-Confined   0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6674    12322   Dev_Pervious-C-Med-Unconfined 0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6674    12411   Dev_Pervious-D-Low-Confined   0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6674    12412   Dev_Pervious-D-Low-Unconfined 0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6674    12421   Dev_Pervious-D-Med-Confined   0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6674    12422   Dev_Pervious-D-Med-Unconfined 0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6674    13111   Agriculture-A-Low-Confined    0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6674    13112   Agriculture-A-Low-Unconfined  0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6674    13121   Agriculture-A-Med-Confined    0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6674    13122   Agriculture-A-Med-Unconfined  0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6674    13211   Agriculture-B-Low-Confined    0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6674    13212   Agriculture-B-Low-Unconfined  0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6674    13221   Agriculture-B-Med-Confined    0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6674    13222   Agriculture-B-Med-Unconfined  0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6674    13231   Agriculture-B-High-Confined   0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6674    13232   Agriculture-B-High-Unconfined 0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6674    13311   Agriculture-C-Low-Confined    0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6674    13312   Agriculture-C-Low-Unconfined  0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6674    13321   Agriculture-C-Med-Confined    0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6674    13322   Agriculture-C-Med-Unconfined  0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6674    13331   Agriculture-C-High-Confined   0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6674    13411   Agriculture-D-Low-Confined    0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6674    13412   Agriculture-D-Low-Unconfined  0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6674    13421   Agriculture-D-Med-Confined    0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6674    13422   Agriculture-D-Med-Unconfined  0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6674    13431   Agriculture-D-High-Confined   0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6674    13432   Agriculture-D-High-Unconfined 0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6674    14121   Veg_Low-A-Med-Confined 0.000000       0.000000       0.000000       0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
```

```
6674    14122   Veg_Low-A-Med-Unconfined       0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6674    14131   Veg_Low-A-High-Confined        0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6674    14132   Veg_Low-A-High-Unconfined      0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6674    14221   Veg_Low-B-Med-Confined 0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6674    14222   Veg_Low-B-Med-Unconfined       0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6674    14231   Veg_Low-B-High-Confined        0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6674    14232   Veg_Low-B-High-Unconfined      0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6674    14321   Veg_Low-C-Med-Confined 0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6674    14322   Veg_Low-C-Med-Unconfined       0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6674    14331   Veg_Low-C-High-Confined        0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6674    14332   Veg_Low-C-High-Unconfined      0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6674    14421   Veg_Low-D-Med-Confined 0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6674    14422   Veg_Low-D-Med-Unconfined       0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6674    14431   Veg_Low-D-High-Confined        0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6674    14432   Veg_Low-D-High-Unconfined      0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6674    15121   Veg_High-A-Med-Confined        0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6674    15122   Veg_High-A-Med-Unconfined      0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6674    15131   Veg_High-A-High-Confined       0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6674    15132   Veg_High-A-High-Unconfined     0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6674    15221   Veg_High-B-Med-Confined        0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6674    15222   Veg_High-B-Med-Unconfined      0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6674    15231   Veg_High-B-High-Confined       0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6674    15232   Veg_High-B-High-Unconfined     0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6674    15321   Veg_High-C-Med-Confined        0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6674    15322   Veg_High-C-Med-Unconfined      0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6674    15331   Veg_High-C-High-Confined       0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6674    15332   Veg_High-C-High-Unconfined     0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6674    15421   Veg_High-D-Med-Confined        0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6674    15422   Veg_High-D-Med-Unconfined      0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6674    15431   Veg_High-D-High-Confined       0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6674    15432   Veg_High-D-High-Unconfined     0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6674    16000   Water-All-All-All      0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6675    1000    Road_Freeway-All-All-All       0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6675    2000    Road_Primary-All-All-All       0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6675    3000    Road_Minor-All-All-All 0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6675    4000    Dev_ResHigh-All-All-All        0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6675    5000    Dev_ResLow-All-All-All 0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6675    6000    Dev_Com-All-All-All    0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6675    7000    Dev_Ind-All-All-All    0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
```

```
6675    8000    Dev_Inst-All-All-All    0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6675    9000    Dev_Roof-All-All-All    0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6675    10000   Dev_Overspray-All-All-All       0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6675    11111   Dev_Irrigated-A-Low-Confined    0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6675    11112   Dev_Irrigated-A-Low-Unconfined          0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6675    11121   Dev_Irrigated-A-Med-Confined    0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6675    11122   Dev_Irrigated-A-Med-Unconfined          0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6675    11211   Dev_Irrigated-B-Low-Confined    0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6675    11212   Dev_Irrigated-B-Low-Unconfined          0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6675    11221   Dev_Irrigated-B-Med-Confined    0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6675    11222   Dev_Irrigated-B-Med-Unconfined          0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6675    11311   Dev_Irrigated-C-Low-Confined    0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6675    11312   Dev_Irrigated-C-Low-Unconfined          0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6675    11321   Dev_Irrigated-C-Med-Confined    0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6675    11322   Dev_Irrigated-C-Med-Unconfined          0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6675    11411   Dev_Irrigated-D-Low-Confined    0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6675    11412   Dev_Irrigated-D-Low-Unconfined          0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6675    11421   Dev_Irrigated-D-Med-Confined    0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6675    11422   Dev_Irrigated-D-Med-Unconfined          0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6675    12111   Dev_Pervious-A-Low-Confined     0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6675    12112   Dev_Pervious-A-Low-Unconfined   0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6675    12121   Dev_Pervious-A-Med-Confined     0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6675    12122   Dev_Pervious-A-Med-Unconfined   0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6675    12211   Dev_Pervious-B-Low-Confined     0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6675    12212   Dev_Pervious-B-Low-Unconfined   0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6675    12221   Dev_Pervious-B-Med-Confined     0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6675    12222   Dev_Pervious-B-Med-Unconfined   0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6675    12311   Dev_Pervious-C-Low-Confined     0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6675    12312   Dev_Pervious-C-Low-Unconfined   0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6675    12321   Dev_Pervious-C-Med-Confined     0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6675    12322   Dev_Pervious-C-Med-Unconfined   0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6675    12411   Dev_Pervious-D-Low-Confined     0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6675    12412   Dev_Pervious-D-Low-Unconfined   0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6675    12421   Dev_Pervious-D-Med-Confined     0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6675    12422   Dev_Pervious-D-Med-Unconfined   0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6675    13111   Agriculture-A-Low-Confined      0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6675    13112   Agriculture-A-Low-Unconfined    0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6675    13121   Agriculture-A-Med-Confined      0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6675    13122   Agriculture-A-Med-Unconfined    0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
```

```
6675    13211   Agriculture-B-Low-Confined    0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6675    13212   Agriculture-B-Low-Unconfined  0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6675    13221   Agriculture-B-Med-Confined    0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6675    13222   Agriculture-B-Med-Unconfined  0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6675    13231   Agriculture-B-High-Confined   0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6675    13232   Agriculture-B-High-Unconfined 0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6675    13311   Agriculture-C-Low-Confined    0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6675    13312   Agriculture-C-Low-Unconfined  0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6675    13321   Agriculture-C-Med-Confined    0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6675    13322   Agriculture-C-Med-Unconfined  0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6675    13331   Agriculture-C-High-Confined   0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6675    13411   Agriculture-D-Low-Confined    0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6675    13412   Agriculture-D-Low-Unconfined  0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6675    13421   Agriculture-D-Med-Confined    0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6675    13422   Agriculture-D-Med-Unconfined  0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6675    13431   Agriculture-D-High-Confined   0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6675    13432   Agriculture-D-High-Unconfined 0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6675    14121   Veg_Low-A-Med-Confined 0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6675    14122   Veg_Low-A-Med-Unconfined      0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6675    14131   Veg_Low-A-High-Confined       0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6675    14132   Veg_Low-A-High-Unconfined     0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6675    14221   Veg_Low-B-Med-Confined 0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6675    14222   Veg_Low-B-Med-Unconfined      0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6675    14231   Veg_Low-B-High-Confined       0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6675    14232   Veg_Low-B-High-Unconfined     0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6675    14321   Veg_Low-C-Med-Confined 0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6675    14322   Veg_Low-C-Med-Unconfined      0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6675    14331   Veg_Low-C-High-Confined       0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6675    14332   Veg_Low-C-High-Unconfined     0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6675    14421   Veg_Low-D-Med-Confined 0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6675    14422   Veg_Low-D-Med-Unconfined      0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6675    14431   Veg_Low-D-High-Confined       0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6675    14432   Veg_Low-D-High-Unconfined     0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6675    15121   Veg_High-A-Med-Confined       0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6675    15122   Veg_High-A-Med-Unconfined     0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6675    15131   Veg_High-A-High-Confined      0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6675    15132   Veg_High-A-High-Unconfined    0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6675    15221   Veg_High-B-Med-Confined       0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6675    15222   Veg_High-B-Med-Unconfined     0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
```

```
6675    15231   Veg_High-B-High-Confined        0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6675    15232   Veg_High-B-High-Unconfined      0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6675    15321   Veg_High-C-Med-Confined         0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6675    15322   Veg_High-C-Med-Unconfined       0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6675    15331   Veg_High-C-High-Confined        0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6675    15332   Veg_High-C-High-Unconfined      0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6675    15421   Veg_High-D-Med-Confined         0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6675    15422   Veg_High-D-Med-Unconfined       0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6675    15431   Veg_High-D-High-Confined        0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6675    15432   Veg_High-D-High-Unconfined      0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6675    16000   Water-All-All-All       0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6684    1000    Road_Freeway-All-All-All        0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6684    2000    Road_Primary-All-All-All        0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6684    3000    Road_Minor-All-All-All 0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6684    4000    Dev_ResHigh-All-All-All         0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6684    5000    Dev_ResLow-All-All-All 0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6684    6000    Dev_Com-All-All-All     0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6684    7000    Dev_Ind-All-All-All     0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6684    8000    Dev_Inst-All-All-All    0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6684    9000    Dev_Roof-All-All-All    0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6684    10000   Dev_Overspray-All-All-All       0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6684    11111   Dev_Irrigated-A-Low-Confined    0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6684    11112   Dev_Irrigated-A-Low-Unconfined          0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6684    11121   Dev_Irrigated-A-Med-Confined    0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6684    11122   Dev_Irrigated-A-Med-Unconfined          0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6684    11211   Dev_Irrigated-B-Low-Confined    0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6684    11212   Dev_Irrigated-B-Low-Unconfined          0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6684    11221   Dev_Irrigated-B-Med-Confined    0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6684    11222   Dev_Irrigated-B-Med-Unconfined          0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6684    11311   Dev_Irrigated-C-Low-Confined    0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6684    11312   Dev_Irrigated-C-Low-Unconfined          0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6684    11321   Dev_Irrigated-C-Med-Confined    0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6684    11322   Dev_Irrigated-C-Med-Unconfined          0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6684    11411   Dev_Irrigated-D-Low-Confined    0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6684    11412   Dev_Irrigated-D-Low-Unconfined          0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6684    11421   Dev_Irrigated-D-Med-Confined    0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6684    11422   Dev_Irrigated-D-Med-Unconfined          0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6684    12111   Dev_Pervious-A-Low-Confined     0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6684    12112   Dev_Pervious-A-Low-Unconfined 0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
```

```
6684   12121  Dev_Pervious-A-Med-Confined   0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6684   12122  Dev_Pervious-A-Med-Unconfined 0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6684   12211  Dev_Pervious-B-Low-Confined   0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6684   12212  Dev_Pervious-B-Low-Unconfined 0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6684   12221  Dev_Pervious-B-Med-Confined   0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6684   12222  Dev_Pervious-B-Med-Unconfined 0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6684   12311  Dev_Pervious-C-Low-Confined   0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6684   12312  Dev_Pervious-C-Low-Unconfined 0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6684   12321  Dev_Pervious-C-Med-Confined   0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6684   12322  Dev_Pervious-C-Med-Unconfined 0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6684   12411  Dev_Pervious-D-Low-Confined   0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6684   12412  Dev_Pervious-D-Low-Unconfined 0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6684   12421  Dev_Pervious-D-Med-Confined   0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6684   12422  Dev_Pervious-D-Med-Unconfined 0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6684   13111  Agriculture-A-Low-Confined    0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6684   13112  Agriculture-A-Low-Unconfined  0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6684   13121  Agriculture-A-Med-Confined    0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6684   13122  Agriculture-A-Med-Unconfined  0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6684   13211  Agriculture-B-Low-Confined    0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6684   13212  Agriculture-B-Low-Unconfined  0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6684   13221  Agriculture-B-Med-Confined    0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6684   13222  Agriculture-B-Med-Unconfined  0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6684   13231  Agriculture-B-High-Confined   0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6684   13232  Agriculture-B-High-Unconfined 0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6684   13311  Agriculture-C-Low-Confined    0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6684   13312  Agriculture-C-Low-Unconfined  0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6684   13321  Agriculture-C-Med-Confined    0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6684   13322  Agriculture-C-Med-Unconfined  0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6684   13331  Agriculture-C-High-Confined   0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6684   13411  Agriculture-D-Low-Confined    0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6684   13412  Agriculture-D-Low-Unconfined  0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6684   13421  Agriculture-D-Med-Confined    0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6684   13422  Agriculture-D-Med-Unconfined  0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6684   13431  Agriculture-D-High-Confined   0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6684   13432  Agriculture-D-High-Unconfined 0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6684   14121  Veg_Low-A-Med-Confined 0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6684   14122  Veg_Low-A-Med-Unconfined      0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6684   14131  Veg_Low-A-High-Confined       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6684   14132  Veg_Low-A-High-Unconfined     0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
```

```
6684   14221   Veg_Low-B-Med-Confined 0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6684   14222   Veg_Low-B-Med-Unconfined      0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6684   14231   Veg_Low-B-High-Confined       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6684   14232   Veg_Low-B-High-Unconfined     0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6684   14321   Veg_Low-C-Med-Confined 0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6684   14322   Veg_Low-C-Med-Unconfined      0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6684   14331   Veg_Low-C-High-Confined       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6684   14332   Veg_Low-C-High-Unconfined     0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6684   14421   Veg_Low-D-Med-Confined 0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6684   14422   Veg_Low-D-Med-Unconfined      0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6684   14431   Veg_Low-D-High-Confined       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6684   14432   Veg_Low-D-High-Unconfined     0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6684   15121   Veg_High-A-Med-Confined       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6684   15122   Veg_High-A-Med-Unconfined     0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6684   15131   Veg_High-A-High-Confined      0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6684   15132   Veg_High-A-High-Unconfined    0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6684   15221   Veg_High-B-Med-Confined       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6684   15222   Veg_High-B-Med-Unconfined     0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6684   15231   Veg_High-B-High-Confined      0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6684   15232   Veg_High-B-High-Unconfined    0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6684   15321   Veg_High-C-Med-Confined       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6684   15322   Veg_High-C-Med-Unconfined     0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6684   15331   Veg_High-C-High-Confined      0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6684   15332   Veg_High-C-High-Unconfined    0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6684   15421   Veg_High-D-Med-Confined       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6684   15422   Veg_High-D-Med-Unconfined     0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6684   15431   Veg_High-D-High-Confined      0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6684   15432   Veg_High-D-High-Unconfined    0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6684   16000   Water-All-All-All      0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6839   1000    Road_Freeway-All-All-All      0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6839   2000    Road_Primary-All-All-All      0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6839   3000    Road_Minor-All-All-All 0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6839   4000    Dev_ResHigh-All-All-All       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6839   5000    Dev_ResLow-All-All-All 0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6839   6000    Dev_Com-All-All-All    0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6839   7000    Dev_Ind-All-All-All    0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6839   8000    Dev_Inst-All-All-All   0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6839   9000    Dev_Roof-All-All-All   0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6839   10000   Dev_Overspray-All-All-All     0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
```

```
6839    11111  Dev_Irrigated-A-Low-Confined  0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6839    11112  Dev_Irrigated-A-Low-Unconfined        0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6839    11121  Dev_Irrigated-A-Med-Confined  0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6839    11122  Dev_Irrigated-A-Med-Unconfined        0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6839    11211  Dev_Irrigated-B-Low-Confined  0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6839    11212  Dev_Irrigated-B-Low-Unconfined        0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6839    11221  Dev_Irrigated-B-Med-Confined  0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6839    11222  Dev_Irrigated-B-Med-Unconfined        0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6839    11311  Dev_Irrigated-C-Low-Confined  0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6839    11312  Dev_Irrigated-C-Low-Unconfined        0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6839    11321  Dev_Irrigated-C-Med-Confined  0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6839    11322  Dev_Irrigated-C-Med-Unconfined        0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6839    11411  Dev_Irrigated-D-Low-Confined  0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6839    11412  Dev_Irrigated-D-Low-Unconfined        0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6839    11421  Dev_Irrigated-D-Med-Confined  0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6839    11422  Dev_Irrigated-D-Med-Unconfined        0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6839    12111  Dev_Pervious-A-Low-Confined   0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6839    12112  Dev_Pervious-A-Low-Unconfined 0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6839    12121  Dev_Pervious-A-Med-Confined   0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6839    12122  Dev_Pervious-A-Med-Unconfined 0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6839    12211  Dev_Pervious-B-Low-Confined   0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6839    12212  Dev_Pervious-B-Low-Unconfined 0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6839    12221  Dev_Pervious-B-Med-Confined   0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6839    12222  Dev_Pervious-B-Med-Unconfined 0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6839    12311  Dev_Pervious-C-Low-Confined   0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6839    12312  Dev_Pervious-C-Low-Unconfined 0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6839    12321  Dev_Pervious-C-Med-Confined   0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6839    12322  Dev_Pervious-C-Med-Unconfined 0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6839    12411  Dev_Pervious-D-Low-Confined   0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6839    12412  Dev_Pervious-D-Low-Unconfined 0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6839    12421  Dev_Pervious-D-Med-Confined   0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6839    12422  Dev_Pervious-D-Med-Unconfined 0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6839    13111  Agriculture-A-Low-Confined    0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6839    13112  Agriculture-A-Low-Unconfined  0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6839    13121  Agriculture-A-Med-Confined    0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6839    13122  Agriculture-A-Med-Unconfined  0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6839    13211  Agriculture-B-Low-Confined    0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6839    13212  Agriculture-B-Low-Unconfined  0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6839    13221  Agriculture-B-Med-Confined    0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
```

```
6839    13222   Agriculture-B-Med-Unconfined  0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6839    13231   Agriculture-B-High-Confined   0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6839    13232   Agriculture-B-High-Unconfined 0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6839    13311   Agriculture-C-Low-Confined    0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6839    13312   Agriculture-C-Low-Unconfined  0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6839    13321   Agriculture-C-Med-Confined    0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6839    13322   Agriculture-C-Med-Unconfined  0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6839    13331   Agriculture-C-High-Confined   0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6839    13411   Agriculture-D-Low-Confined    0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6839    13412   Agriculture-D-Low-Unconfined  0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6839    13421   Agriculture-D-Med-Confined    0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6839    13422   Agriculture-D-Med-Unconfined  0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6839    13431   Agriculture-D-High-Confined   0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6839    13432   Agriculture-D-High-Unconfined 0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6839    14121   Veg_Low-A-Med-Confined 0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6839    14122   Veg_Low-A-Med-Unconfined      0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6839    14131   Veg_Low-A-High-Confined       0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6839    14132   Veg_Low-A-High-Unconfined     0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6839    14221   Veg_Low-B-Med-Confined 0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6839    14222   Veg_Low-B-Med-Unconfined      0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6839    14231   Veg_Low-B-High-Confined       0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6839    14232   Veg_Low-B-High-Unconfined     0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6839    14321   Veg_Low-C-Med-Confined 0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6839    14322   Veg_Low-C-Med-Unconfined      0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6839    14331   Veg_Low-C-High-Confined       0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6839    14332   Veg_Low-C-High-Unconfined     0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6839    14421   Veg_Low-D-Med-Confined 0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6839    14422   Veg_Low-D-Med-Unconfined      0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6839    14431   Veg_Low-D-High-Confined       0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6839    14432   Veg_Low-D-High-Unconfined     0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6839    15121   Veg_High-A-Med-Confined       0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6839    15122   Veg_High-A-Med-Unconfined     0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6839    15131   Veg_High-A-High-Confined      0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6839    15132   Veg_High-A-High-Unconfined    0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6839    15221   Veg_High-B-Med-Confined       0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6839    15222   Veg_High-B-Med-Unconfined     0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6839    15231   Veg_High-B-High-Confined      0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6839    15232   Veg_High-B-High-Unconfined    0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6839    15321   Veg_High-C-Med-Confined       0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
```

```
6839    15322  Veg_High-C-Med-Unconfined     0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6839    15331  Veg_High-C-High-Confined      0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6839    15332  Veg_High-C-High-Unconfined    0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6839    15421  Veg_High-D-Med-Confined       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6839    15422  Veg_High-D-Med-Unconfined     0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6839    15431  Veg_High-D-High-Confined      0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6839    15432  Veg_High-D-High-Unconfined    0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6839    16000  Water-All-All-All     0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6844    1000   Road_Freeway-All-All-All      0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6844    2000   Road_Primary-All-All-All      0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6844    3000   Road_Minor-All-All-All 0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6844    4000   Dev_ResHigh-All-All-All       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6844    5000   Dev_ResLow-All-All-All 0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6844    6000   Dev_Com-All-All-All    0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6844    7000   Dev_Ind-All-All-All    0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6844    8000   Dev_Inst-All-All-All   0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6844    9000   Dev_Roof-All-All-All   0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6844    10000  Dev_Overspray-All-All-All     0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6844    11111  Dev_Irrigated-A-Low-Confined  0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6844    11112  Dev_Irrigated-A-Low-Unconfined        0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6844    11121  Dev_Irrigated-A-Med-Confined  0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6844    11122  Dev_Irrigated-A-Med-Unconfined        0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6844    11211  Dev_Irrigated-B-Low-Confined  0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6844    11212  Dev_Irrigated-B-Low-Unconfined        0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6844    11221  Dev_Irrigated-B-Med-Confined  0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6844    11222  Dev_Irrigated-B-Med-Unconfined        0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6844    11311  Dev_Irrigated-C-Low-Confined  0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6844    11312  Dev_Irrigated-C-Low-Unconfined        0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6844    11321  Dev_Irrigated-C-Med-Confined  0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6844    11322  Dev_Irrigated-C-Med-Unconfined        0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6844    11411  Dev_Irrigated-D-Low-Confined  0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6844    11412  Dev_Irrigated-D-Low-Unconfined        0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6844    11421  Dev_Irrigated-D-Med-Confined  0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6844    11422  Dev_Irrigated-D-Med-Unconfined        0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6844    12111  Dev_Pervious-A-Low-Confined   0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6844    12112  Dev_Pervious-A-Low-Unconfined 0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6844    12121  Dev_Pervious-A-Med-Confined   0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6844    12122  Dev_Pervious-A-Med-Unconfined 0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6844    12211  Dev_Pervious-B-Low-Confined   0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
```

```
6844    12212   Dev_Pervious-B-Low-Unconfined 0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6844    12221   Dev_Pervious-B-Med-Confined   0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6844    12222   Dev_Pervious-B-Med-Unconfined 0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6844    12311   Dev_Pervious-C-Low-Confined   0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6844    12312   Dev_Pervious-C-Low-Unconfined 0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6844    12321   Dev_Pervious-C-Med-Confined   0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6844    12322   Dev_Pervious-C-Med-Unconfined 0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6844    12411   Dev_Pervious-D-Low-Confined   0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6844    12412   Dev_Pervious-D-Low-Unconfined 0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6844    12421   Dev_Pervious-D-Med-Confined   0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6844    12422   Dev_Pervious-D-Med-Unconfined 0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6844    13111   Agriculture-A-Low-Confined    0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6844    13112   Agriculture-A-Low-Unconfined  0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6844    13121   Agriculture-A-Med-Confined    0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6844    13122   Agriculture-A-Med-Unconfined  0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6844    13211   Agriculture-B-Low-Confined    0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6844    13212   Agriculture-B-Low-Unconfined  0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6844    13221   Agriculture-B-Med-Confined    0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6844    13222   Agriculture-B-Med-Unconfined  0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6844    13231   Agriculture-B-High-Confined   0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6844    13232   Agriculture-B-High-Unconfined 0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6844    13311   Agriculture-C-Low-Confined    0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6844    13312   Agriculture-C-Low-Unconfined  0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6844    13321   Agriculture-C-Med-Confined    0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6844    13322   Agriculture-C-Med-Unconfined  0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6844    13331   Agriculture-C-High-Confined   0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6844    13411   Agriculture-D-Low-Confined    0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6844    13412   Agriculture-D-Low-Unconfined  0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6844    13421   Agriculture-D-Med-Confined    0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6844    13422   Agriculture-D-Med-Unconfined  0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6844    13431   Agriculture-D-High-Confined   0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6844    13432   Agriculture-D-High-Unconfined 0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6844    14121   Veg_Low-A-Med-Confined 0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6844    14122   Veg_Low-A-Med-Unconfined      0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6844    14131   Veg_Low-A-High-Confined       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6844    14132   Veg_Low-A-High-Unconfined     0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6844    14221   Veg_Low-B-Med-Confined 0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6844    14222   Veg_Low-B-Med-Unconfined      0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6844    14231   Veg_Low-B-High-Confined       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
```

```
6844    14232   Veg_Low-B-High-Unconfined     0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6844    14321   Veg_Low-C-Med-Confined 0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6844    14322   Veg_Low-C-Med-Unconfined      0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6844    14331   Veg_Low-C-High-Confined       0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6844    14332   Veg_Low-C-High-Unconfined     0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6844    14421   Veg_Low-D-Med-Confined 0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6844    14422   Veg_Low-D-Med-Unconfined      0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6844    14431   Veg_Low-D-High-Confined       0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6844    14432   Veg_Low-D-High-Unconfined     0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6844    15121   Veg_High-A-Med-Confined       0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6844    15122   Veg_High-A-Med-Unconfined     0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6844    15131   Veg_High-A-High-Confined      0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6844    15132   Veg_High-A-High-Unconfined    0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6844    15221   Veg_High-B-Med-Confined       0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6844    15222   Veg_High-B-Med-Unconfined     0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6844    15231   Veg_High-B-High-Confined      0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6844    15232   Veg_High-B-High-Unconfined    0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6844    15321   Veg_High-C-Med-Confined       0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6844    15322   Veg_High-C-Med-Unconfined     0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6844    15331   Veg_High-C-High-Confined      0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6844    15332   Veg_High-C-High-Unconfined    0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6844    15421   Veg_High-D-Med-Confined       0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6844    15422   Veg_High-D-Med-Unconfined     0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6844    15431   Veg_High-D-High-Confined      0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6844    15432   Veg_High-D-High-Unconfined    0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6844    16000   Water-All-All-All      0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6850    1000    Road_Freeway-All-All-All      0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6850    2000    Road_Primary-All-All-All      0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6850    3000    Road_Minor-All-All-All 0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6850    4000    Dev_ResHigh-All-All-All       0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6850    5000    Dev_ResLow-All-All-All 0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6850    6000    Dev_Com-All-All-All    0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6850    7000    Dev_Ind-All-All-All    0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6850    8000    Dev_Inst-All-All-All   0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6850    9000    Dev_Roof-All-All-All   0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6850    10000   Dev_Overspray-All-All-All     0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6850    11111   Dev_Irrigated-A-Low-Confined  0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6850    11112   Dev_Irrigated-A-Low-Unconfined        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6850    11121   Dev_Irrigated-A-Med-Confined  0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
```

```
6850    11122  Dev_Irrigated-A-Med-Unconfined        0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6850    11211  Dev_Irrigated-B-Low-Confined  0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6850    11212  Dev_Irrigated-B-Low-Unconfined        0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6850    11221  Dev_Irrigated-B-Med-Confined  0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6850    11222  Dev_Irrigated-B-Med-Unconfined        0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6850    11311  Dev_Irrigated-C-Low-Confined  0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6850    11312  Dev_Irrigated-C-Low-Unconfined        0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6850    11321  Dev_Irrigated-C-Med-Confined  0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6850    11322  Dev_Irrigated-C-Med-Unconfined        0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6850    11411  Dev_Irrigated-D-Low-Confined  0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6850    11412  Dev_Irrigated-D-Low-Unconfined        0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6850    11421  Dev_Irrigated-D-Med-Confined  0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6850    11422  Dev_Irrigated-D-Med-Unconfined        0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6850    12111  Dev_Pervious-A-Low-Confined   0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6850    12112  Dev_Pervious-A-Low-Unconfined 0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6850    12121  Dev_Pervious-A-Med-Confined   0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6850    12122  Dev_Pervious-A-Med-Unconfined 0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6850    12211  Dev_Pervious-B-Low-Confined   0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6850    12212  Dev_Pervious-B-Low-Unconfined 0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6850    12221  Dev_Pervious-B-Med-Confined   0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6850    12222  Dev_Pervious-B-Med-Unconfined 0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6850    12311  Dev_Pervious-C-Low-Confined   0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6850    12312  Dev_Pervious-C-Low-Unconfined 0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6850    12321  Dev_Pervious-C-Med-Confined   0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6850    12322  Dev_Pervious-C-Med-Unconfined 0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6850    12411  Dev_Pervious-D-Low-Confined   0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6850    12412  Dev_Pervious-D-Low-Unconfined 0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6850    12421  Dev_Pervious-D-Med-Confined   0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6850    12422  Dev_Pervious-D-Med-Unconfined 0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6850    13111  Agriculture-A-Low-Confined    0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6850    13112  Agriculture-A-Low-Unconfined  0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6850    13121  Agriculture-A-Med-Confined    0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6850    13122  Agriculture-A-Med-Unconfined  0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6850    13211  Agriculture-B-Low-Confined    0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6850    13212  Agriculture-B-Low-Unconfined  0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6850    13221  Agriculture-B-Med-Confined    0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6850    13222  Agriculture-B-Med-Unconfined  0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6850    13231  Agriculture-B-High-Confined   0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6850    13232  Agriculture-B-High-Unconfined 0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
```

```
6850    13311   Agriculture-C-Low-Confined     0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6850    13312   Agriculture-C-Low-Unconfined   0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6850    13321   Agriculture-C-Med-Confined     0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6850    13322   Agriculture-C-Med-Unconfined   0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6850    13331   Agriculture-C-High-Confined    0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6850    13411   Agriculture-D-Low-Confined     0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6850    13412   Agriculture-D-Low-Unconfined   0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6850    13421   Agriculture-D-Med-Confined     0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6850    13422   Agriculture-D-Med-Unconfined   0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6850    13431   Agriculture-D-High-Confined    0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6850    13432   Agriculture-D-High-Unconfined 0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6850    14121   Veg_Low-A-Med-Confined 0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6850    14122   Veg_Low-A-Med-Unconfined       0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6850    14131   Veg_Low-A-High-Confined        0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6850    14132   Veg_Low-A-High-Unconfined      0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6850    14221   Veg_Low-B-Med-Confined 0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6850    14222   Veg_Low-B-Med-Unconfined       0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6850    14231   Veg_Low-B-High-Confined        0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6850    14232   Veg_Low-B-High-Unconfined      0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6850    14321   Veg_Low-C-Med-Confined 0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6850    14322   Veg_Low-C-Med-Unconfined       0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6850    14331   Veg_Low-C-High-Confined        0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6850    14332   Veg_Low-C-High-Unconfined      0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6850    14421   Veg_Low-D-Med-Confined 0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6850    14422   Veg_Low-D-Med-Unconfined       0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6850    14431   Veg_Low-D-High-Confined        0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6850    14432   Veg_Low-D-High-Unconfined      0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6850    15121   Veg_High-A-Med-Confined        0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6850    15122   Veg_High-A-Med-Unconfined      0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6850    15131   Veg_High-A-High-Confined       0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6850    15132   Veg_High-A-High-Unconfined     0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6850    15221   Veg_High-B-Med-Confined        0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6850    15222   Veg_High-B-Med-Unconfined      0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6850    15231   Veg_High-B-High-Confined       0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6850    15232   Veg_High-B-High-Unconfined     0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6850    15321   Veg_High-C-Med-Confined        0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6850    15322   Veg_High-C-Med-Unconfined      0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6850    15331   Veg_High-C-High-Confined       0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6850    15332   Veg_High-C-High-Unconfined     0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
```

```
6850    15421  Veg_High-D-Med-Confined       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6850    15422  Veg_High-D-Med-Unconfined     0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6850    15431  Veg_High-D-High-Confined      0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6850    15432  Veg_High-D-High-Unconfined    0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6850    16000  Water-All-All-All      0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6856    1000   Road_Freeway-All-All-All      0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6856    2000   Road_Primary-All-All-All      0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6856    3000   Road_Minor-All-All-All 0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6856    4000   Dev_ResHigh-All-All-All       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6856    5000   Dev_ResLow-All-All-All 0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6856    6000   Dev_Com-All-All-All    0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6856    7000   Dev_Ind-All-All-All    0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6856    8000   Dev_Inst-All-All-All   0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6856    9000   Dev_Roof-All-All-All   0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6856    10000  Dev_Overspray-All-All-All     0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6856    11111  Dev_Irrigated-A-Low-Confined  0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6856    11112  Dev_Irrigated-A-Low-Unconfined       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6856    11121  Dev_Irrigated-A-Med-Confined  0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6856    11122  Dev_Irrigated-A-Med-Unconfined       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6856    11211  Dev_Irrigated-B-Low-Confined  0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6856    11212  Dev_Irrigated-B-Low-Unconfined       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6856    11221  Dev_Irrigated-B-Med-Confined  0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6856    11222  Dev_Irrigated-B-Med-Unconfined       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6856    11311  Dev_Irrigated-C-Low-Confined  0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6856    11312  Dev_Irrigated-C-Low-Unconfined       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6856    11321  Dev_Irrigated-C-Med-Confined  0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6856    11322  Dev_Irrigated-C-Med-Unconfined       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6856    11411  Dev_Irrigated-D-Low-Confined  0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6856    11412  Dev_Irrigated-D-Low-Unconfined       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6856    11421  Dev_Irrigated-D-Med-Confined  0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6856    11422  Dev_Irrigated-D-Med-Unconfined       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6856    12111  Dev_Pervious-A-Low-Confined   0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6856    12112  Dev_Pervious-A-Low-Unconfined 0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6856    12121  Dev_Pervious-A-Med-Confined   0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6856    12122  Dev_Pervious-A-Med-Unconfined 0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6856    12211  Dev_Pervious-B-Low-Confined   0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6856    12212  Dev_Pervious-B-Low-Unconfined 0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6856    12221  Dev_Pervious-B-Med-Confined   0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6856    12222  Dev_Pervious-B-Med-Unconfined 0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
```

```
6856    12311   Dev_Pervious-C-Low-Confined   0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6856    12312   Dev_Pervious-C-Low-Unconfined 0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6856    12321   Dev_Pervious-C-Med-Confined   0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6856    12322   Dev_Pervious-C-Med-Unconfined 0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6856    12411   Dev_Pervious-D-Low-Confined   0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6856    12412   Dev_Pervious-D-Low-Unconfined 0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6856    12421   Dev_Pervious-D-Med-Confined   0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6856    12422   Dev_Pervious-D-Med-Unconfined 0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6856    13111   Agriculture-A-Low-Confined    0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6856    13112   Agriculture-A-Low-Unconfined  0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6856    13121   Agriculture-A-Med-Confined    0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6856    13122   Agriculture-A-Med-Unconfined  0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6856    13211   Agriculture-B-Low-Confined    0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6856    13212   Agriculture-B-Low-Unconfined  0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6856    13221   Agriculture-B-Med-Confined    0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6856    13222   Agriculture-B-Med-Unconfined  0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6856    13231   Agriculture-B-High-Confined   0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6856    13232   Agriculture-B-High-Unconfined 0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6856    13311   Agriculture-C-Low-Confined    0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6856    13312   Agriculture-C-Low-Unconfined  0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6856    13321   Agriculture-C-Med-Confined    0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6856    13322   Agriculture-C-Med-Unconfined  0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6856    13331   Agriculture-C-High-Confined   0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6856    13411   Agriculture-D-Low-Confined    0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6856    13412   Agriculture-D-Low-Unconfined  0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6856    13421   Agriculture-D-Med-Confined    0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6856    13422   Agriculture-D-Med-Unconfined  0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6856    13431   Agriculture-D-High-Confined   0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6856    13432   Agriculture-D-High-Unconfined 0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6856    14121   Veg_Low-A-Med-Confined 0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6856    14122   Veg_Low-A-Med-Unconfined      0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6856    14131   Veg_Low-A-High-Confined       0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6856    14132   Veg_Low-A-High-Unconfined     0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6856    14221   Veg_Low-B-Med-Confined 0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6856    14222   Veg_Low-B-Med-Unconfined      0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6856    14231   Veg_Low-B-High-Confined       0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6856    14232   Veg_Low-B-High-Unconfined     0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6856    14321   Veg_Low-C-Med-Confined 0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6856    14322   Veg_Low-C-Med-Unconfined      0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
```

```
6856    14331  Veg_Low-C-High-Confined       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6856    14332  Veg_Low-C-High-Unconfined     0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6856    14421  Veg_Low-D-Med-Confined 0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6856    14422  Veg_Low-D-Med-Unconfined      0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6856    14431  Veg_Low-D-High-Confined       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6856    14432  Veg_Low-D-High-Unconfined     0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6856    15121  Veg_High-A-Med-Confined       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6856    15122  Veg_High-A-Med-Unconfined     0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6856    15131  Veg_High-A-High-Confined      0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6856    15132  Veg_High-A-High-Unconfined    0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6856    15221  Veg_High-B-Med-Confined       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6856    15222  Veg_High-B-Med-Unconfined     0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6856    15231  Veg_High-B-High-Confined      0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6856    15232  Veg_High-B-High-Unconfined    0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6856    15321  Veg_High-C-Med-Confined       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6856    15322  Veg_High-C-Med-Unconfined     0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6856    15331  Veg_High-C-High-Confined      0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6856    15332  Veg_High-C-High-Unconfined    0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6856    15421  Veg_High-D-Med-Confined       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6856    15422  Veg_High-D-Med-Unconfined     0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6856    15431  Veg_High-D-High-Confined      0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6856    15432  Veg_High-D-High-Unconfined    0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6856    16000  Water-All-All-All      0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6859    1000   Road_Freeway-All-All-All      0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6859    2000   Road_Primary-All-All-All      0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6859    3000   Road_Minor-All-All-All 0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6859    4000   Dev_ResHigh-All-All-All       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6859    5000   Dev_ResLow-All-All-All 0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6859    6000   Dev_Com-All-All-All    0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6859    7000   Dev_Ind-All-All-All    0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6859    8000   Dev_Inst-All-All-All   0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6859    9000   Dev_Roof-All-All-All   0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6859    10000  Dev_Overspray-All-All-All     0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6859    11111  Dev_Irrigated-A-Low-Confined  0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6859    11112  Dev_Irrigated-A-Low-Unconfined        0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6859    11121  Dev_Irrigated-A-Med-Confined  0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6859    11122  Dev_Irrigated-A-Med-Unconfined        0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6859    11211  Dev_Irrigated-B-Low-Confined  0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6859    11212  Dev_Irrigated-B-Low-Unconfined        0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
```

```
6859    11221  Dev_Irrigated-B-Med-Confined  0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6859    11222  Dev_Irrigated-B-Med-Unconfined       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6859    11311  Dev_Irrigated-C-Low-Confined  0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6859    11312  Dev_Irrigated-C-Low-Unconfined       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6859    11321  Dev_Irrigated-C-Med-Confined  0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6859    11322  Dev_Irrigated-C-Med-Unconfined       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6859    11411  Dev_Irrigated-D-Low-Confined  0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6859    11412  Dev_Irrigated-D-Low-Unconfined       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6859    11421  Dev_Irrigated-D-Med-Confined  0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6859    11422  Dev_Irrigated-D-Med-Unconfined       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6859    12111  Dev_Pervious-A-Low-Confined   0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6859    12112  Dev_Pervious-A-Low-Unconfined 0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6859    12121  Dev_Pervious-A-Med-Confined   0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6859    12122  Dev_Pervious-A-Med-Unconfined 0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6859    12211  Dev_Pervious-B-Low-Confined   0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6859    12212  Dev_Pervious-B-Low-Unconfined 0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6859    12221  Dev_Pervious-B-Med-Confined   0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6859    12222  Dev_Pervious-B-Med-Unconfined 0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6859    12311  Dev_Pervious-C-Low-Confined   0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6859    12312  Dev_Pervious-C-Low-Unconfined 0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6859    12321  Dev_Pervious-C-Med-Confined   0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6859    12322  Dev_Pervious-C-Med-Unconfined 0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6859    12411  Dev_Pervious-D-Low-Confined   0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6859    12412  Dev_Pervious-D-Low-Unconfined 0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6859    12421  Dev_Pervious-D-Med-Confined   0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6859    12422  Dev_Pervious-D-Med-Unconfined 0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6859    13111  Agriculture-A-Low-Confined    0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6859    13112  Agriculture-A-Low-Unconfined  0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6859    13121  Agriculture-A-Med-Confined    0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6859    13122  Agriculture-A-Med-Unconfined  0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6859    13211  Agriculture-B-Low-Confined    0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6859    13212  Agriculture-B-Low-Unconfined  0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6859    13221  Agriculture-B-Med-Confined    0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6859    13222  Agriculture-B-Med-Unconfined  0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6859    13231  Agriculture-B-High-Confined   0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6859    13232  Agriculture-B-High-Unconfined 0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6859    13311  Agriculture-C-Low-Confined    0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6859    13312  Agriculture-C-Low-Unconfined  0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6859    13321  Agriculture-C-Med-Confined    0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
```

```
6859    13322   Agriculture-C-Med-Unconfined  0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6859    13331   Agriculture-C-High-Confined   0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6859    13411   Agriculture-D-Low-Confined    0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6859    13412   Agriculture-D-Low-Unconfined  0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6859    13421   Agriculture-D-Med-Confined    0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6859    13422   Agriculture-D-Med-Unconfined  0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6859    13431   Agriculture-D-High-Confined   0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6859    13432   Agriculture-D-High-Unconfined 0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6859    14121   Veg_Low-A-Med-Confined 0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6859    14122   Veg_Low-A-Med-Unconfined      0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6859    14131   Veg_Low-A-High-Confined       0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6859    14132   Veg_Low-A-High-Unconfined     0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6859    14221   Veg_Low-B-Med-Confined 0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6859    14222   Veg_Low-B-Med-Unconfined      0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6859    14231   Veg_Low-B-High-Confined       0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6859    14232   Veg_Low-B-High-Unconfined     0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6859    14321   Veg_Low-C-Med-Confined 0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6859    14322   Veg_Low-C-Med-Unconfined      0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6859    14331   Veg_Low-C-High-Confined       0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6859    14332   Veg_Low-C-High-Unconfined     0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6859    14421   Veg_Low-D-Med-Confined 0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6859    14422   Veg_Low-D-Med-Unconfined      0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6859    14431   Veg_Low-D-High-Confined       0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6859    14432   Veg_Low-D-High-Unconfined     0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6859    15121   Veg_High-A-Med-Confined       0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6859    15122   Veg_High-A-Med-Unconfined     0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6859    15131   Veg_High-A-High-Confined      0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6859    15132   Veg_High-A-High-Unconfined    0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6859    15221   Veg_High-B-Med-Confined       0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6859    15222   Veg_High-B-Med-Unconfined     0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6859    15231   Veg_High-B-High-Confined      0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6859    15232   Veg_High-B-High-Unconfined    0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6859    15321   Veg_High-C-Med-Confined       0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6859    15322   Veg_High-C-Med-Unconfined     0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6859    15331   Veg_High-C-High-Confined      0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6859    15332   Veg_High-C-High-Unconfined    0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6859    15421   Veg_High-D-Med-Confined       0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6859    15422   Veg_High-D-Med-Unconfined     0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6859    15431   Veg_High-D-High-Confined      0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
```

```
6859    15432  Veg_High-D-High-Unconfined    0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6859    16000  Water-All-All-All     0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6861    1000   Road_Freeway-All-All-All      0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6861    2000   Road_Primary-All-All-All      0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6861    3000   Road_Minor-All-All-All 0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6861    4000   Dev_ResHigh-All-All-All       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6861    5000   Dev_ResLow-All-All-All 0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6861    6000   Dev_Com-All-All-All    0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6861    7000   Dev_Ind-All-All-All    0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6861    8000   Dev_Inst-All-All-All   0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6861    9000   Dev_Roof-All-All-All   0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6861    10000  Dev_Overspray-All-All-All     0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6861    11111  Dev_Irrigated-A-Low-Confined  0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6861    11112  Dev_Irrigated-A-Low-Unconfined       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6861    11121  Dev_Irrigated-A-Med-Confined  0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6861    11122  Dev_Irrigated-A-Med-Unconfined       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6861    11211  Dev_Irrigated-B-Low-Confined  0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6861    11212  Dev_Irrigated-B-Low-Unconfined       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6861    11221  Dev_Irrigated-B-Med-Confined  0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6861    11222  Dev_Irrigated-B-Med-Unconfined       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6861    11311  Dev_Irrigated-C-Low-Confined  0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6861    11312  Dev_Irrigated-C-Low-Unconfined       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6861    11321  Dev_Irrigated-C-Med-Confined  0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6861    11322  Dev_Irrigated-C-Med-Unconfined       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6861    11411  Dev_Irrigated-D-Low-Confined  0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6861    11412  Dev_Irrigated-D-Low-Unconfined       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6861    11421  Dev_Irrigated-D-Med-Confined  0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6861    11422  Dev_Irrigated-D-Med-Unconfined       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6861    12111  Dev_Pervious-A-Low-Confined   0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6861    12112  Dev_Pervious-A-Low-Unconfined 0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6861    12121  Dev_Pervious-A-Med-Confined   0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6861    12122  Dev_Pervious-A-Med-Unconfined 0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6861    12211  Dev_Pervious-B-Low-Confined   0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6861    12212  Dev_Pervious-B-Low-Unconfined 0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6861    12221  Dev_Pervious-B-Med-Confined   0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6861    12222  Dev_Pervious-B-Med-Unconfined 0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6861    12311  Dev_Pervious-C-Low-Confined   0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6861    12312  Dev_Pervious-C-Low-Unconfined 0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6861    12321  Dev_Pervious-C-Med-Confined   0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
```

```
6861   12322   Dev_Pervious-C-Med-Unconfined 0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6861   12411   Dev_Pervious-D-Low-Confined   0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6861   12412   Dev_Pervious-D-Low-Unconfined 0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6861   12421   Dev_Pervious-D-Med-Confined   0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6861   12422   Dev_Pervious-D-Med-Unconfined 0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6861   13111   Agriculture-A-Low-Confined    0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6861   13112   Agriculture-A-Low-Unconfined  0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6861   13121   Agriculture-A-Med-Confined    0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6861   13122   Agriculture-A-Med-Unconfined  0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6861   13211   Agriculture-B-Low-Confined    0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6861   13212   Agriculture-B-Low-Unconfined  0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6861   13221   Agriculture-B-Med-Confined    0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6861   13222   Agriculture-B-Med-Unconfined  0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6861   13231   Agriculture-B-High-Confined   0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6861   13232   Agriculture-B-High-Unconfined 0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6861   13311   Agriculture-C-Low-Confined    0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6861   13312   Agriculture-C-Low-Unconfined  0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6861   13321   Agriculture-C-Med-Confined    0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6861   13322   Agriculture-C-Med-Unconfined  0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6861   13331   Agriculture-C-High-Confined   0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6861   13411   Agriculture-D-Low-Confined    0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6861   13412   Agriculture-D-Low-Unconfined  0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6861   13421   Agriculture-D-Med-Confined    0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6861   13422   Agriculture-D-Med-Unconfined  0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6861   13431   Agriculture-D-High-Confined   0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6861   13432   Agriculture-D-High-Unconfined 0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6861   14121   Veg_Low-A-Med-Confined 0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6861   14122   Veg_Low-A-Med-Unconfined      0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6861   14131   Veg_Low-A-High-Confined       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6861   14132   Veg_Low-A-High-Unconfined     0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6861   14221   Veg_Low-B-Med-Confined 0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6861   14222   Veg_Low-B-Med-Unconfined      0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6861   14231   Veg_Low-B-High-Confined       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6861   14232   Veg_Low-B-High-Unconfined     0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6861   14321   Veg_Low-C-Med-Confined 0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6861   14322   Veg_Low-C-Med-Unconfined      0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6861   14331   Veg_Low-C-High-Confined       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6861   14332   Veg_Low-C-High-Unconfined     0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6861   14421   Veg_Low-D-Med-Confined 0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
```

```
       6861   14422  Veg_Low-D-Med-Unconfined      0.000000      0.000000      0.000000      0.000000
       0.000000      0.000000      0.000000      0.000000      0.000000      0.000000
       6861   14431  Veg_Low-D-High-Confined       0.000000      0.000000      0.000000      0.000000
       0.000000      0.000000      0.000000      0.000000      0.000000      0.000000
       6861   14432  Veg_Low-D-High-Unconfined     0.000000      0.000000      0.000000      0.000000
       0.000000      0.000000      0.000000      0.000000      0.000000      0.000000
       6861   15121  Veg_High-A-Med-Confined       0.000000      0.000000      0.000000      0.000000
       0.000000      0.000000      0.000000      0.000000      0.000000      0.000000
       6861   15122  Veg_High-A-Med-Unconfined     0.000000      0.000000      0.000000      0.000000
       0.000000      0.000000      0.000000      0.000000      0.000000      0.000000
       6861   15131  Veg_High-A-High-Confined      0.000000      0.000000      0.000000      0.000000
       0.000000      0.000000      0.000000      0.000000      0.000000      0.000000
       6861   15132  Veg_High-A-High-Unconfined    0.000000      0.000000      0.000000      0.000000
       0.000000      0.000000      0.000000      0.000000      0.000000      0.000000
       6861   15221  Veg_High-B-Med-Confined       0.000000      0.000000      0.000000      0.000000
       0.000000      0.000000      0.000000      0.000000      0.000000      0.000000
       6861   15222  Veg_High-B-Med-Unconfined     0.000000      0.000000      0.000000      0.000000
       0.000000      0.000000      0.000000      0.000000      0.000000      0.000000
       6861   15231  Veg_High-B-High-Confined      0.000000      0.000000      0.000000      0.000000
       0.000000      0.000000      0.000000      0.000000      0.000000      0.000000
       6861   15232  Veg_High-B-High-Unconfined    0.000000      0.000000      0.000000      0.000000
       0.000000      0.000000      0.000000      0.000000      0.000000      0.000000
       6861   15321  Veg_High-C-Med-Confined       0.000000      0.000000      0.000000      0.000000
       0.000000      0.000000      0.000000      0.000000      0.000000      0.000000
       6861   15322  Veg_High-C-Med-Unconfined     0.000000      0.000000      0.000000      0.000000
       0.000000      0.000000      0.000000      0.000000      0.000000      0.000000
       6861   15331  Veg_High-C-High-Confined      0.000000      0.000000      0.000000      0.000000
       0.000000      0.000000      0.000000      0.000000      0.000000      0.000000
       6861   15332  Veg_High-C-High-Unconfined    0.000000      0.000000      0.000000      0.000000
       0.000000      0.000000      0.000000      0.000000      0.000000      0.000000
       6861   15421  Veg_High-D-Med-Confined       0.000000      0.000000      0.000000      0.000000
       0.000000      0.000000      0.000000      0.000000      0.000000      0.000000
       6861   15422  Veg_High-D-Med-Unconfined     0.000000      0.000000      0.000000      0.000000
       0.000000      0.000000      0.000000      0.000000      0.000000      0.000000
       6861   15431  Veg_High-D-High-Confined      0.000000      0.000000      0.000000      0.000000
       0.000000      0.000000      0.000000      0.000000      0.000000      0.000000
       6861   15432  Veg_High-D-High-Unconfined    0.000000      0.000000      0.000000      0.000000
       0.000000      0.000000      0.000000      0.000000      0.000000      0.000000
       6861   16000  Water-All-All-All     0.000000      0.000000      0.000000      0.000000
       0.000000      0.000000      0.000000      0.000000      0.000000      0.000000
c---------------------------------------------------------------------------------------------
c680 TMDL reach control (used if ncrch > 0 on card 600)
c
c    rchid         controlled reach id
c    outlet        controlled reach outlet id
c    switch_mon    monthly switch to control conc limit or reduction of pollutant from the corresponding reach
(0-off, 1-on)
c
c   rchid   outlet   switch_1   switch_2......switch_12
c---------------------------------------------------------------------------------------------
c685 TMDL reach control (used if ncrch > 0 on card 600)
c
c    rchid         controlled reach id
c    outlet        controlled reach outlet id
c    limit-flow    flow limit from the corresponding reach (cfs)
c    limit_pol     concentration limit of pollutant from the corresponding reach (mg/l or ug/l or #/100ml)
c
c   rchid   outlet   limit_flow   limit_qual1...limit_qual2...limit_qualn
c---------------------------------------------------------------------------------------------
c690 TMDL reach control (used if ncrch > 0 on card 600)
c
c    rchid         controlled reach id
c    outlet        controlled reach outlet id
c    reduction     reduction of pollutant from the corresponding reach (fraction)
c                  reduction in outflow will also reduce the pollutant mass from the outflow and
c                  any defined reduction to pollutant will be the additional
c
c   rchid   outlet   reduction_flow...reduction_qual1...reduction_qual2...reduction_qualn
c---------------------------------------------------------------------------------------------
```

---

**From:** Ernesto Rivera <ERIVERA@dpw.lacounty.gov>
**Sent:** Wednesday, October 14, 2020 3:28 PM
**To:** Levitt, Melissa; Genevieve Osmena; Nayiri Vartanian
**Cc:** Repenning, Heather; Reiter, Craig
**Subject:** RE: Measure W LACFCD Conceptual Approval - MOL Water Infiltration & Quality Project

Melissa,
I apologize for the delay in getting back to you on this. We received unexpected number of requests for concept approvals. We have reviewed your project, recommended approval, and have drafted a concept approval letter. We have been informed by the Safe Clean Water Team that the applications submitted by the deadline will be considered complete (even if the approval letter is pending). You can include this email in your application. Otherwise, we'll provide you a signed concept approval letter once it becomes available. Thank you.

Ernesto J Rivera, P.E.
Civil Engineer
Los Angeles County Public Works
Office: (626) 458-6110

---

**From:** Levitt, Melissa <LevittM@metro.net>
**Sent:** Wednesday, October 14, 2020 10:34 AM
**To:** Ernesto Rivera <ERIVERA@dpw.lacounty.gov>; Genevieve Osmena <gosmena@dpw.lacounty.gov>; Nayiri Vartanian <NVARTANIAN@dpw.lacounty.gov>
**Cc:** Repenning, Heather <RepenningH@metro.net>; Reiter, Craig <ReiterC@metro.net>
**Subject:** RE: Measure W LACFCD Conceptual Approval - MOL Water Infiltration & Quality Project

Hello Nayiri and Ernesto,

Thank you for taking the time to speak with me yesterday and confirming the LACFCD is providing conceptual approval for our Measure W application. My understanding is that is that a letter will be sent via mail confirming this. Since the Measure W application is due Thursday and I am currently telecommuting, would it be possible to receive an electronic copy of the letter or a confirmation via email?

Thank you in advance for your assistance,
Melissa

**Melissa Faigeles Levitt, MPA, ENV SP**
LA Metro
Senior Environmental Specialist
Environmental Compliance & Sustainability
213.418.3478 W
213.265.0774 C
**Metro's mission is to provide world-class transportation for all.**
**I am currently telecommuting. I am available via email and cell phone during this period*

---

**From:** Ernesto Rivera <ERIVERA@dpw.lacounty.gov>
**Sent:** Thursday, October 8, 2020 9:29 AM
**To:** Levitt, Melissa <LevittM@metro.net>; Genevieve Osmena <gosmena@dpw.lacounty.gov>; Nayiri Vartanian <NVARTANIAN@dpw.lacounty.gov>
**Cc:** Repenning, Heather <RepenningH@metro.net>; Reiter, Craig <ReiterC@metro.net>
**Subject:** RE: Measure W LACFCD Conceptual Approval - MOL Water Infiltration & Quality Project

Melissa,
Thank you for following up. Our concept approval / recommendation will go up to our administration today. I anticipate being able to provide you a final response by next Tuesday or Wednesday. I'll keep you updated if any changes. Thanks again.

Ernesto J Rivera, P.E.
Civil Engineer
Los Angeles County Public Works
Office: (626) 458-6110

---

**From:** Levitt, Melissa <LevittM@metro.net>
**Sent:** Thursday, October 8, 2020 9:24 AM
**To:** Genevieve Osmena <gosmena@dpw.lacounty.gov>; Ernesto Rivera <ERIVERA@dpw.lacounty.gov>; Nayiri Vartanian <NVARTANIAN@dpw.lacounty.gov>
**Cc:** Repenning, Heather <RepenningH@metro.net>; Reiter, Craig <ReiterC@metro.net>
**Subject:** RE: Measure W LACFCD Conceptual Approval - MOL Water Infiltration & Quality Project

Good morning Ernesto and Nayiri,

I wanted to follow up to see if you have any questions regarding the materials provided for the Metro Orange Line Water Infiltration and Quality Project? I am happy to discuss the project with you, at your convenience. Can you please advise on when I may anticipate a decision on the conceptual approval of the project?

Thank you in advance for your assistance,
Melissa

**Melissa Faigeles Levitt, MPA, ENV SP**
LA Metro
Senior Environmental Specialist
Environmental Compliance & Sustainability
213.418.3478 W
213.265.0774 C
**Metro's mission is to provide world-class transportation for all.**
**I am currently telecommuting. I am available via email and cell phone during this period*

---

**From:** Levitt, Melissa
**Sent:** Monday, October 5, 2020 10:07 AM
**To:** 'Genevieve Osmena' <gosmena@dpw.lacounty.gov>; Ernesto Rivera <ERIVERA@dpw.lacounty.gov>; Nayiri Vartanian <NVARTANIAN@dpw.lacounty.gov>
**Cc:** Repenning, Heather <RepenningH@metro.net>; Reiter, Craig <ReiterC@metro.net>
**Subject:** RE: Measure W LACFCD Conceptual Approval - MOL Water Infiltration & Quality Project

Ernesto and Nayiri,

Please see attached our draft BMP site layout plan. Let me know if you have any questions or would like to set up a time to discuss the project. Metro is seeking to obtain conceptual approval from LACFCD in advance of submitting our Measure W application for the project. Please let me know if there is additional information you would like me to provide.

Regards,
Melissa

**Melissa Faigeles Levitt, MPA, ENV SP**
LA Metro
Senior Environmental Specialist
Environmental Compliance & Sustainability
213.418.3478 W
213.265.0774 C
**Metro's mission is to provide world-class transportation for all.**
**I am currently telecommuting. I am available via email and cell phone during this period*

---

**From:** Levitt, Melissa
**Sent:** Thursday, October 1, 2020 10:05 AM
**To:** Genevieve Osmena <gosmena@dpw.lacounty.gov>
**Cc:** Repenning, Heather <RepenningH@metro.net>; Reiter, Craig <ReiterC@metro.net>; Ernesto Rivera <ERIVERA@dpw.lacounty.gov>; Nayiri Vartanian <NVARTANIAN@dpw.lacounty.gov>
**Subject:** RE: Measure W LACFCD Conceptual Approval - MOL Water Infiltration & Quality Project

Thank you, Genevieve.

Ernesto and Nayiri – Please see attached our draft Hydrology and Water Quality Analysis. I should have a BMP site layout plan to share with you by tomorrow. I am available to answer any questions that you might have.

Thank you,
Melissa

**Melissa Faigeles Levitt, MPA, ENV SP**
LA Metro
Senior Environmental Specialist
Environmental Compliance & Sustainability
213.418.3478 W
213.265.0774 C
**Metro's mission is to provide world-class transportation for all.**
**I am currently telecommuting. I am available via email and cell phone during this period*

---

**From:** Genevieve Osmena <gosmena@dpw.lacounty.gov>
**Sent:** Wednesday, September 30, 2020 11:04 AM
**To:** Levitt, Melissa <LevittM@metro.net>
**Cc:** Repenning, Heather <RepenningH@metro.net>; Reiter, Craig <ReiterC@metro.net>; Ernesto Rivera <ERIVERA@dpw.lacounty.gov>; Nayiri Vartanian <NVARTANIAN@dpw.lacounty.gov>
**Subject:** Re: Measure W LACFCD Conceptual Approval - MOL Water Infiltration & Quality Project

Hi Melissa,

Please go ahead and work directly with Ernesto Rivera and Nayiri Vartanian of my team, who I have cc'd above. They will be reviewing the project info and will coordinate with you on the requested concept approval letter. Thank you also for sending the project fact sheet. If you happen to have any other items like a feasibility or concept report that you're able to share, feel free to send that to our team as well.

Thank you,

Genevieve Osmena, P.E.
Senior Civil Engineer
Los Angeles County Public Works
Office: (626) 458-4322

---

**From:** Levitt, Melissa <LevittM@metro.net>
**Sent:** Tuesday, September 29, 2020 11:41 AM
**To:** Genevieve Osmena <gosmena@dpw.lacounty.gov>
**Cc:** Repenning, Heather <RepenningH@metro.net>; Reiter, Craig <ReiterC@metro.net>
**Subject:** Measure W LACFCD Conceptual Approval - MOL Water Infiltration & Quality Project

Genevieve,

Metro, in partnership with LADWP is preparing to submit a Measure W application for FY 20-21 in the Upper Los Angeles River Watershed. The Metro Orange Line Water Infiltration and Quality Project proposes to implement 168 drywells with pretreatment facilities to capture, treat, and infiltrate stormwater runoff from 2,320 acres drainage area, resulting in an estimated annual groundwater recharge yield between 780 and 1,050 acre-feet/year into the San Fernando Groundwater Basin.

As the proposed Project involves LACFCD's storm drain facilities, Metro is seeking to obtain conceptual approval from LACFCD. I have attached a Project fact sheet, which provides more details on the proposed Project and LACFCD facilities. I am happy to set up a time to discuss the Project and answer any questions you might have, at your earliest convenience.

Regards,
Melissa

**Melissa Faigeles Levitt, MPA, ENV SP**
LA Metro
Senior Environmental Specialist
Environmental Compliance & Sustainability
213.418.3478 W
213.265.0774 C
**Metro's mission is to provide world-class transportation for all.**
**I am currently telecommuting. I am available via email and cell phone during this period*

**COUNTY OF LOS ANGELES**

**DEPARTMENT OF PUBLIC WORKS**

*"To Enrich Lives Through Effective and Caring Service"*

900 SOUTH FREMONT AVENUE
ALHAMBRA, CALIFORNIA 91803-1331
Telephone: (626) 458-5100
http://dpw.lacounty.gov

**MARK PESTRELLA, Director**

ADDRESS ALL CORRESPONDENCE TO:
P.O. BOX 1460
ALHAMBRA, CALIFORNIA 91802-1460

IN REPLY PLEASE
REFER TO FILE: SWP-5

October 19, 2020

Ms. Melissa Levitt
Los Angeles County Metropolitan Transportation Authority
One Gateway Plaza
Mail Stop 99-16-9
Los Angeles, CA 90012-2952

**NOTICE OF CONCEPTUAL APPROVAL FOR SAFE, CLEAN WATER PROGRAM CONSIDERATION OF INFRASTRUCTURE PROJECTS FUNDING**

Los Angeles County Flood Control District has been engaged to review the following project and is hereby providing conceptual approval:

Metro Orange Line Water Infiltration and Quality Project
LA Metro-Environmental Compliance and Sustainability
Upper Los Angeles Watershed Area

We understand the proposed multi-benefit project will increase groundwater recharge, by implementing 168 drywells with pretreatment facilities, which will capture, treat and infiltrate dry weather and stormwater runoff. This will help reduce the pollutant load on the Los Angeles River. In addition, this Project will allow Metro to contribute to regional groundwater infiltration and help towards achieving goals to become net water positive.

The Project is not currently inconsistent with any District plans, policies, or goals. Conceptual approval for this Project does not indicate the District's consent to support or even permit the Project. If funding is ultimately allocated to the Project, it is required that the developer remain closely engaged with the District throughout each subsequent project phase and comply with any eventual applicable agreement and/or permit provisions. Please upload a copy of this letter in the Projects Module application when responding to the Regional Program Call for Projects.

Please be sure to continue to work with your District's Watershed Manager from Los Angeles County Public Works, Genevieve Osmena. Ms. Osmena can be reached at (626) 458-4322 or gosmena@pw.lacounty.gov. Ongoing collaboration is imperative. If the subject project is not funded within 2 years from the date of this letter, a new demonstration of conceptual approval will be required before the project can again be considered.

Thank you for your interest in the Safe, Clean Water Program.

MARK PESTRELLA
Chief Engineer
Los Angeles County Flood Control District

Keith Lilley

KEITH A. LILLEY
Assistant Deputy Director
Stormwater Planning Division

GO:bm
P:\swppub\Secretarial\2020\Letters\GO.Metro Orange Line- Conceptual Approval1.docx

Geosyntec consultants

engineers | scientists | innovators

Metro

# Utility Review

# Metro Orange Line Water Infiltration and Quality Project

The Metro Orange Line Water Infiltration and Quality Project (Project) proposes to design and implement infiltration best management practices (BMPs) within LA Metro parcels and right-of-way (ROW) in the East San Fernando Valley. The Project will correspond with the Metro Orange Line Bus Rail Transit (MOL BRT) Improvements Project, one of Metro's self-funded capital improvement projects. The purpose of the Project is to capture and infiltrate stormwater runoff, to improve downstream water quality, help recharge the groundwater basin, and mitigate localized nuisance flooding in disadvantaged communities and neighborhoods with significant unmet needs within the neighboring geographical area. This will be accomplished through the installation of 168 drywells, as well as underground pretreatment facilities, separated into seven geographic clusters.

The conceptual design presented in "Project Configuration" section of this application is prepared in reference to the record as-built, which includes information on existing:

- Storm drains;
- Sewers;
- Gas lines;
- Power supply lines;
- Pacific Telephone/Telegraph & Western Union phone lines;
- Electrolier lighting conduits;
- Traffic signal conduits;
- Police and fire alarm conduits;
- Oil and gasoline pipelines; and
- Vaults, footing, and miscellaneous structures.

Project design elements were prepared to ensure compatibility, as best as is possible from the desktop, with existing utilities. Existing utilities are part of the reference layers behind the conceptual design uploaded "Project Configuration" section of this application. Conflicts with existing wet utilities are limited to storm drains that will be incorporated into the project and sewer lines that will be designed around. As shown in the drawing, minor alterations to the existing storm drains within Metro right-of-way will be required to divert on-site stormwater runoff into the proposed infiltration BMPs at Sites MOL-1, MOL-4 and MOL-7. In addition, the diversion structures at MOL-3, MOL-6 and MOL-7 will cross existing sewer lines. For MOL-3 and MOL-7, since stormwater will be diverted via active pumping at both sites, the diversion pipes will be placed at deeper depth than the sewer lines to avoid interference. For MOL-6, a shallow lateral pipe will be constructed to connect catch basins on the west side of Woodman Ave. to the BMP to avoid interference.

Additional surveying and potholing will be conducted as project design proceeds to confirm the exact location of utilities, and the Project design will be refined accordingly.

# ATTACHMENTS FOR SECTION 2.5:

## MONITORING

# Monitoring Plan

## Metro Orange Line Water Infiltration and Quality Project

## TABLE OF CONTENTS

# 1. INTRODUCTION

The Metro Orange Line Water Infiltration and Quality Project (Project) proposes to design and implement distributed low impact development (LID) infiltration best management practices (BMPs) within LA Metro parcels and right-of-way (ROW) in the East San Fernando Valley. The Project will correspond with the Metro Orange Line Bus Rail Transit (MOL BRT) Improvement Project, one of Metro's self-funded capital improvement projects. The purpose of the Project is to capture and infiltrate stormwater runoff, to improve downstream water quality, help recharge the groundwater basin, and mitigate localized nuisance flooding in disadvantaged communities and neighborhoods with significant unmet needs within the neighboring geographical area. This will be accomplished through the installation of 168 drywells, as well as underground pretreatment facilities, separated into seven geographic clusters.

## 1.1 Monitoring Objectives

The objectives of this monitoring plan are to:

1. Measure the effectiveness of the proposed Project once completed, and
2. Guide staff in performing observations, measurements, and sample collection in the field.

The primary effectiveness metrics for the proposed Project are defined generally in terms of achieved water supply and water quality benefits. Water supply benefits will be monitored by measuring inflow into proposed facilities, and water quality benefits will be monitored by collecting water samples of stormwater runoff upstream of proposed Project facilities. It is assumed that all runoff that enters a project facility will be infiltrated, and all pollutants that enter the facility can therefore be considered reduced, as they will have been diverted from the downstream receiving water.

Especially relevant pollutants of concern for the proposed Project include zinc, the primary pollutant as identified in the Project feasibility study, and bacteria (specifically *E. coli)*, the secondary pollutant as identified in the Project feasibility study. These pollutants are identified in the Upper LA River EWMP as "limiting pollutants", the pollutants that drive BMP capacity (i.e., control measures that address limiting pollutants will also address other pollutants). The full list of constituents to be analyzed is discussed in Table 1.

Visual observations provide qualitative data on facility parameters that might impact BMP performance or explain analytical results. Visual observations of the conditions and performance of the proposed facilities will include:

- Trash, sediment, and debris buildup in the pretreatment systems (i.e., subsurface pretreatment galleries and drywell primary settling chambers);
- Description of any odors, floating material, suspended material, sheen, and discoloration; and

- Qualitative observations of flow patterns (i.e., presence and estimate of bypass flows).

## 1.2 Monitoring Plan Development

This Monitoring Plan has been developed as part of the Project feasibility study. Project facility locations and other Project specifics are subject to change prior to or during the Project construction process. Therefore, some details in this Monitoring Plan will be determined at a later stage of project development, such as:

- Sampling frequency;
- The precise locations of monitoring sites, inlet/outlet locations, and BMP ID numbers for use in the field forms;
- The number of facilities to be monitored;
- The laboratories used for sample analyses;
- Specific staff involved in monitoring or sample collection; and
- Site-specific elements of field documents such as health and safety plans and field observation logs.

# 2. MONITORING STRATEGY

## 2.1 Monitoring Strategy

The effectiveness of the proposed Project facilities (drywell clusters with underground pretreatment galleries) will be assessed during both dry and wet weather.

The primary effectiveness metrics for water supply and water quality benefits can best be assessed during wet weather events by measuring flowrates and analyzing collected water samples. Visual observations during wet weather events can also provide valuable insight into flow patterns and approximate capture/bypass ratios, which can aid in identifying potential issues such as clogging or ponding. “First-flush” rain events at the beginning of the rainy season are a priority for monitoring, as a particularly large amount of pollutants, sediment, and trash can be expected to be present in runoff during these events.

Dry weather monitoring also provides key insight into Project performance. During dry weather, drywell primary settling chambers and pretreatment galleries will be more readily accessible and observable. Dry weather observations can yield information about sediment and/or trash buildup within the drywell primary settling chambers, providing information on future maintenance requirements or the necessity of additional pretreatment or trash screens. Dry-weather runoff flows are anticipated to be minimal in the Project area, and all Project facilities are expected to capture and treat 100% of dry-weather flows.

Water quality grab samples will be collected between the diversion structure feeding the drywell cluster, prior to any pretreatment (either underground pretreatment galleries or drywell primary settling chambers). As each cluster of drywells receives flow from the same diversion structure, sampling from this location is expected to be characteristic of all influent for all associated drywells. Preliminarily, it is expected that for one of the drywell clusters there will be flow monitor installation, water quality sample collection, and visual observations, and the remaining four clusters will only be monitored through visual observations. Within each cluster, one drywell and the associated underground pretreatment gallery will be visually inspected.

### 2.2 Runoff Volume and Pollutant Load Estimation

Wet and dry weather runoff inflow to the drywells is a critical parameter to monitor. Runoff volume and flowrate will be measured by installing flow meters between the drywells (and their associated pretreatment galleries) and diversion structure at selected clusters. Flow meters will provide continuous measurement of flow depth, and when combined with known pipe geometry, will generate continuous flow data. If desired and if budget allows, redundant flow monitors of different types can be installed as a backup to ensure data collection, which is especially important due to the infrequency of rain events in the Los Angeles area.

As a supplement and comparison to data collected by flow monitors, flow volumes and rates for each facility will be estimated based on rainfall data, infiltration rates, and the characteristics of each facility's tributary drainage area. These estimates may be calibrated with the data collected by flow monitors, to better extrapolate field data to unmonitored clusters. Pollutant load data from the monitored sites will be extrapolated to unmonitored sites using these calibrated flow estimates.

### 2.3 Monitoring Locations

Monitoring locations will be selected after facility locations are finalized.

## 3. SAMPLING PROCEDURES AND ANALYTICAL METHODS

### 3.1 Wet-Weather Mobilization

Weather forecasts will be tracked using the National Weather Service (NWS) Los Angeles/Oxnard Weather Forecast Office website[1], set to the approximate centroid of the project facilities. Wet-weather mobilization will be based on the criteria set forth in Attachment E, Part VIII.B.1.b.iii of the 2012 Los Angeles Region MS4 Permit, targeting storms with predicted rainfall of 0.25 inches and at least 70% probability of rainfall. Best professional judgement by the sampling coordinator shall be used to determine mobilization activities for marginally qualifying storm events, taking into consideration budget constraints associated with potential false starts.

---

[1] https://www.wrh.noaa.gov/forecast/wxtables/index.php?lat=34.18482583857345&lon=-118.38892936706544

## 3.2 Dry-Weather Mobilization

Dry-weather visual observations will be conducted once each monitoring year between May 31st and October 1st, where monthly rainfall totals in the Project region are typically below 0.1 inches. This monitoring period will allow for assessment of sediment and debris buildup in pretreatment systems after the entirety of the rainy season.

## 3.3 Laboratory

A laboratory with Environmental Laboratory Accreditation Program (ELAP) certification will be selected for wet weather sample analysis. The laboratory will be located in the Los Angeles region to better facilitate sample delivery and compliance with required hold times.

Potential constituents to be analyzed, their hold times, and their analysis methods are shown below in Table 1.

**Table 1 – Analyzed Constituents, Methods, and Holding Times**

| Constituent | Analysis Method | Holding Time |
|---|---|---|
| *Physical Characteristics* | | |
| pH | YSI ProDSS or similar | N/A; measured in the field |
| Temperature | YSI ProDSS or similar | N/A; measured in the field |
| Dissolved Oxygen | YSI ProDSS or similar | N/A; measured in the field |
| Specific Conductivity | YSI ProDSS or similar | N/A; measured in the field |
| Turbidity | YSI ProDSS or similar | N/A; measured in the field |
| Hardness | SM2340B | 180 days |
| Oil and Grease | SM5510 B | 28 days |
| Total Suspended Solids | SM 2540 D | 7 days |
| Biological Oxygen Demand | SM5210 B | 48 hours |
| *Nutrients* | | |
| Ammonia | SM4500-NH3 B/C | 28 days |
| Nitrite | EPA Method 300.0 | 7 days |
| Nitrate | EPA Method 300.0 | 7 days |
| Total Kjeldahl Nitrogen | SM4500-Norg B | 28 days |
| Total Phosphorus | SM4500-P E | 28 days |
| *Bacteria* | | |
| Total Coliform | SM9221B | 6 hours |
| Fecal Coliform | SM9221E | 6 hours |
| *E. Coli* | SM9221B/E | 6 hours |
| Enterococcus | SM9230B | 6 hours |
| *Metals* | | |
| Zinc | EPA Method 200.8 | 180 days |
| Copper | EPA Method 200.8 | 180 days |
| Lead | EPA Method 200.8 | 180 days |

## 3.4 Field Analytical Methods

Field water quality analyses will be performed at every sampling location where water quality samples are collected for laboratory analysis. A YSI ProDSS, or similar, multi-parameter meter will be used, which is capable of instantly measuring a wide variety of analytes in the field. All meters will be appropriately calibrated prior to each wet weather monitoring event.

### 3.4.1 Sample Container, Collection, Transport, and Holding Procedures

The appropriate size, material, color, preservative, temperature, and hold time requirement for each analyte will be determined in accordance with procedures from the ELAP-certified laboratory. Prior to each wet-weather monitoring event, sample containers will be staged and labeled.

The preferred sample collection method will be to immerse the container directly into the flow or below the static water surface level, using "clean hands/dirty hands" (EPA 1669) collection techniques. Shallow flows may be collected using a sanitized transfer container.

After samples are collected, they will be placed into coolers with ice or cold-packs, kept to a temperature of 4°C or less. Samples will be delivered under chain of custody to the contract laboratory for analysis within six hours (the limiting hold time in Table 1). During sample delivery, laboratory staff will accept the samples and sign the Chain of Custody (COC) form, assuming responsibility for sample storage and completion of analyses within the hold times. Samples should only be disposed by the laboratory after quality assurance/control procedures are reviewed and accepted.

### 3.4.2 Field Logs and Forms

COC forms (as shown in Appendix A) will be obtained from the ELAP-certified laboratory and pre-filled to the extent possible before wet-weather mobilization. The COC forms will identify the sample locations, analyses to be performed, date and time of sample collection, and the sampler's initials.

Each monitoring location will have a customized field observation log form for both dry- and wet-weather monitoring. An example form is provided in Appendix B and will be updated with site-specific details prior to selection of monitoring locations. All completed field observation logs will be digitized after returning from the field.

## 3.5 Quality Assurance and Quality Control

During each wet-weather mobilization, at least one field duplicate and one field blank will be collected. All sampling procedures will adhere to the guidelines set forth in the Surface Water Ambient Monitoring Program (SWAMP) operating procedure "Field Collection of Water Samples."

# 4. DATA MANAGEMENT AND REPORTING

All field monitoring/sampling procedures will adhere to the guidelines found in the State of California’s SWAMP procedures, including the Quality Assurance Program Plan (QAPP) included therein. The laboratory will utilize its own QAPP which will supplement this Monitoring Plan. The purpose of the QAPP is to ensure that the monitoring program produces consistent, reliable data that meet the project’s overall goals, and that data quality objectives are met. Data Quality Objectives will be discussed in detail in the QAPP. In general, the QAPP will ensure that laboratory analyses are consistent with guidelines established by the State of California’s SWAMP. The QAPP will also specify the corrective actions to be taken when Data Quality Objectives are not being met.

Field observations and data collected during each monitoring event will be recorded and maintained. These observations include information relevant to a particular sampling event, such as date, time, field personnel, sampling location(s), sample ID, flow estimates, observations, and visual site characteristics as may be relevant to the location and project characteristics. This information will be summarized in each site-specific field form.

# APPENDIX A

## Example Chain of Custody Form

**ENTHALPY ANALYTICAL, INC.**

806 N. Batavia St., Orange, CA 92868
Phone: (714) 771-6900  Fax: (714)771-9933

Billing: Enthalpy - SoCal
c/o Montrose Environmental Group
1 Park Plaza, Suite 1000, Irvine, CA 92614

## Chain of Custody Record

Lab No:

Page: of

**Turn Around Time (Rush by advanced notice only)**

| | | | | | |
|---|---|---|---|---|---|
| Standard: | | 4 Day: | | 3 Day: | |
| 2 Day: | | 1 Day: | | Same Day: | |

**Matrix:** A = Air  DW = Drinking Water
FL = Food Liquid  FS = Food Solid  L = Liquid
PP = Pure Product  S = Solid  SeaW = Sea Water
SW = Swab  W = Water  WP = Wipe  O = Other

**Preservatives:** 1 = $Na_2S_2O_3$  2 = HCl  3 = $HNO_3$
4 = $H_2SO_4$  5 = NaOH  6 = Other

| CUSTOMER INFORMATION | | PROJECT INFORMATION | |
|---|---|---|---|
| Company: | | Name: | |
| Report To: | | Number: | |
| Email: | | P.O. #: | |
| Address: | | Address: | |
| | | | |
| Phone: | | Global ID: | |
| Fax: | | Sampled By: | |

| | Sample ID | Sampling Date | Sampling Time | Matrix | Container No. / Size | Pres. | Analysis Request | | | | | | | | | | Test Instructions / Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | | | | | | | | | | | | | | | | | |
| 2 | | | | | | | | | | | | | | | | | |
| 3 | | | | | | | | | | | | | | | | | |
| 4 | | | | | | | | | | | | | | | | | |
| 5 | | | | | | | | | | | | | | | | | |
| 6 | | | | | | | | | | | | | | | | | |
| 7 | | | | | | | | | | | | | | | | | |
| 8 | | | | | | | | | | | | | | | | | |
| 9 | | | | | | | | | | | | | | | | | |
| 10 | | | | | | | | | | | | | | | | | |

| | Signature | Print Name | Company / Title | Date / Time |
|---|---|---|---|---|
| [1] Relinquished By: | | | | |
| [1] Received By: | | | | |
| [2] Relinquished By: | | | | |
| [2] Received By: | | | | |
| [3] Relinquished By: | | | | |
| [3] Received By: | | | | |

# APPENDIX B

## Example Field Observation Form

# FIELD COLLECTION SHEET
# Metro Orange Line Water Infiltraion and Quality Project

## 1.GENERAL INFORMATION

Arrival Time/Date: ____________ Departure Time ____________

Purpose Of Visit (circle one): Wet / Dry - Weather Event

Names of Sampling Staff:

Other Personnel On Site: ____________

Photos taken: Yes / No Time ________ Description: ____________

## 2.WEATHER

Circle one: Clear / Cloudy / Rain

If Rain, Storm Start Date/Time: ____________ Duration: ________ Rain Depth ________

## 3.OBSERVED PHYSICAL PROPERTIES (circle one):

**Odors** (musty, sewage, sulfur, sour, gas, solvents, other) Yes / No Describe: ____________

**Floating material** Yes / No Describe: ____________

**Suspended material** Yes / No Describe: ____________

**Sheen** Yes / No Describe: ____________

**Discolorations** Yes / No Describe: ____________

**Record estimated % of flow bypassing inlet:** ________ %

**Sediment accumulation in pretreatment unit (in):** ________ inches

## 4. WATER QUALITY SAMPLES

| | | | | | |
|---|---|---|---|---|---|
| Sample ID | | | Sample ID | | |
| Time | | AM/PM | Time | | AM/PM |
| Water temperature | | °C | Water temperature | | °C |
| Turbidity | | NTU | Turbidity | | NTU |
| pH | | S.U. | pH | | S.U. |
| Conductivity | | µS/cm | Conductivity | | µS/cm |
| Dissoved Oxygen | | mg/L | Dissoved Oxygen | | mg/L |

## 5. VISUAL OBSERVATIONS

Observation Locations (describe any 'yes' responses from Section 3, as well as reason for bypass

*Use site ID in all notes*

Water Quality Samples

*Use site ID in all notes*

Meter Type:

Meter ID:

Last Calibration:

Note any other relevant environmental observations (e.g., trash, vegetation health, vandalism, etc.)

*Use site ID in all notes*

Comments (equipment issues, factors that may affect sample quality, problems encutnered, etc.)

SIGNED: ____________

# ATTACHMENTS FOR SECTION 2.6:

## O & M

Geosyntec consultants

engineers | scientists | innovators

Metro

# Operations and Maintenance Plan

## Metro Orange Line Water Infiltration and Quality Project

# 1. INTRODUCTION

The Metro Orange Line Water Infiltration and Quality Project (“Project”) proposes to design and implement distributed low impact development (LID) infiltration best management practices (BMPs) within LA Metro parcels and right-of-way (ROW) in the San Fernando Valley. The Project will coincide with the Metro Orange Line Bus Rail Transit (MOL BRT) Improvement Project, one of Metro’s capital improvement projects. The purpose and need of the Project is to capture and infiltrate stormwater runoff, to improve downstream water quality, help recharge the groundwater basin, and mitigate localized nuisance flooding in disadvantaged communities and neighborhoods with significant unmet needs within the neighboring geographical area. This will be accomplished through the installation of 168 drywells, as well as underground pretreatment facilities, separated into seven geographic clusters.

# 2. MAINTENANCE PROCEDURES

This Operations and Maintenance (O&M) Plan describes the operations and maintenance procedures associated with the Project, with the intent to provide the continued optimal performance of the project components per design intent. The recommendations herein reflect the current standard of care for stormwater management Best Management Practices (BMPs) in the region. Appropriate health and safety precautions (e.g., personal protective equipment, confined space entry, traffic control, etc.) should be followed at all times during maintenance.

This O&M Plan has been developed as part of the Project Feasibility Study. Project facility locations and other project specifics are subject to change prior to or during the Project construction process. Therefore, some details in this plan will be determined at a later stage of project development. These details may include, but are not limited to, the following:

- Record drawings;
- Number of systems to be maintained;
- System configurations; and
- BMP ID numbers for use in field forms.

## 2.1 Maintenance Schedule

A minimum quarterly maintenance schedule for each proposed BMP is outlined below in Table 1. Additional maintenance may be necessary, depending on specific field observations or site conditions. O&M activities may also be coordinated with monitoring activities, although the two schedules may not align precisely.

**Table 1 - Minimum Maintenance Schedule**

| BMP | January – March | April – June | July – September | October – December |
|---|---|---|---|---|
| Underground Pretreatment Galleries (Inspection) | Once | Once | Once | Once |
| Underground Pretreatment Galleries (Cleaning) | Once | Not Required | Once | Not Required |
| Drywells (Inspection) | Not required | Not Required | Once | Once |
| Drywells (Cleaning) | Once every five years | | | |
| Pump Station (Inspection) | Once | Once | Once | Once |
| Pump Station (Cleaning) | Once | Not Required | Once | Not Required |

**Note:** Maintenance activities are recommended to be performed following significant rain events, or on an as-needed basis if the maintenance conditions listed in Section 2.2.1 and Section 2.2.2 (below) are observed during routine inspection and/or monitoring.

## 2.2 Maintenance Activities

Planned maintenance activities for each of the underground pretreatment galleries and the drywells themselves are presented below.

### 2.2.1 Underground Pretreatment Galleries

Flows to seven drywell clusters are pretreated via underground pretreatment galleries (StormTrap DoubleTrap® or equivalent). Flows that enter the pretreatment galleries via the diversion structure either infiltrate through the bottom of the galleries or pass through the outlet and continue to the drywells. Maintenance activities for underground pretreatment galleries consist of:

- Inspecting for and removing inlet and outlet obstructions that may impede flows through the system. This can be accomplished through water jetting or the use of a hook with a long arm;

- Removing trash, debris, and sediment that may prevent infiltration in the galleries when they fill 10% or more of the unit's volume, as measured using a calibrated pole. A truck-mounted hydro-vactor should be used in tandem with sewer jetting equipment to flush sediment toward a vacuum hose for removal, suctioning the materials through a piping system into the vactor truck for off-site disposal. Most often, this work is to be performed by a specialized contractor; and

- Documenting all maintenance performed on the field forms. Example forms are provided in Appendix A.

**Note**: The pretreatment galleries should not be entered under any circumstances without approved confined entry permitting. If person entry is required, do not enter unless properly equipped, trained, and qualified for confined entry.

Additional pretreatment gallery maintenance reference information is provided in Appendix B.

### 2.2.2 Drywells

Maintenance activities for drywells consist of:

- Removing and disposing of trash and debris from inside the drywell chambers;
- Vacuuming sediment from inside the drywell chambers when greater than 15% of the primary settling chambers’ capacity is filled;
- Checking inlet, intake, connector, and drainage pipes for obstructions;
- Removing the debris shield cover and clearing the debris shield, if clogged (Figure 1);
- Replacing absorbent petrochemical sponge, if necessary; and
- Documenting all maintenance performed on the field forms. Example forms are provided in Appendix A.

**Note**: The drywell chambers should not be entered under any circumstances without approved confined entry permitting. If manned entry is required, do not enter unless properly equipped, trained, and qualified for confined entry.

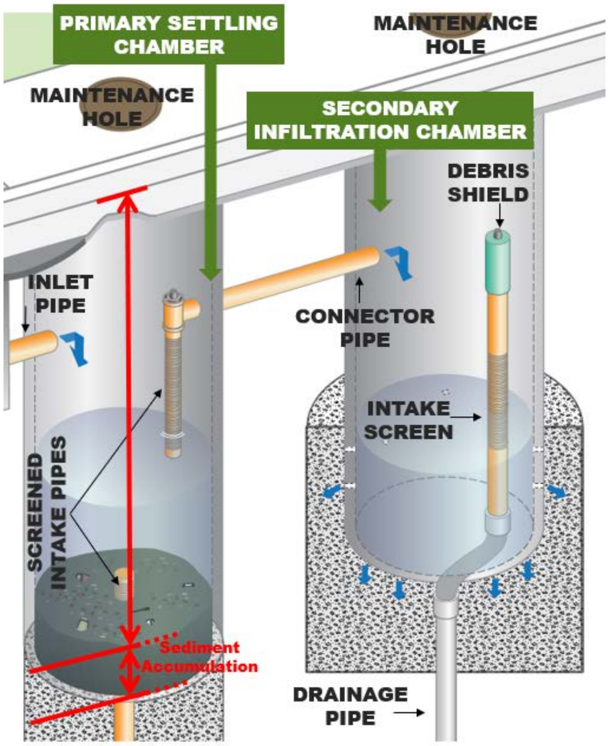


**Figure 2 -Drywell Diagram**

Additional reference information for drywells is provided in Appendix C.

### 2.2.3 Pump Station

Maintenance activities for the pump stations consist of:

- Removing accumulated sediment and debris from wet well;
- Testing the Programmable Logic Controller (PLC) system;
- Inspecting, replacing, and maintaining pumps based on the pump maintenance document provided by the manufacturer;
- Inspecting the submersible pressure transducer and control cable to ensure proper operation. Re-calibrating and repairing based on manufacturers’ recommendations;
- Inspecting all pressurized pipe, bends, connections, reducers, and flanges for leakage and repair if necessary;
- Inspecting areas with underground pressurized pipes and pressure sensor conduits to ensure all pipe and conduits are buried and protected;
- Inspecting pressurized pipe outlets for debris/sediment build-up and blockages; and

- Inspecting pipe stanchions for damage including cracks, bending, irregularities, fractures, and corrosion and repairing or replacing (if necessary).

## 2.3 Maintenance Equipment

Equipment necessary for maintenance consists of:

- Personal protective equipment (PPE);
    - Safety vests and gloves should be worn at all times. If mechanical equipment is used during maintenance, also include safety glasses, hard hats, ear plugs, and steel toe boots. If confined space entry is required, additional PPE may be required.
- Trash bags;
- Pole, to measure sediment depth in underground pretreatment galleries and drywell chambers, and record of 0% depth for each unit for comparison;
- Replacement absorbent petrochemical sponges for drywells;
- Manhole lifter rated to lift 350 pounds;
- Vactor truck, as needed;
- Equipment necessary to clear debris from pipes and drywell debris shields (e.g., drain cables, water jet, hook with long arm, tools to remove debris shield cover);
- Camera to document maintenance activities; and
- Field forms to document maintenance activities.

# 3. MAINTENANCE COST

Table 2 summarizes the annual average labor and equipment cost associated with the O&M schedules and activities described above.

**Table 2. Maintenance Cost Summary**

| BMP Component | Labor Hours | Maintenance Days | Labor Cost[1] | Equipment Cost[2] | Total Cost |
|---|---|---|---|---|---|
| Drywells | 295 | 9 | $29,500 | $40,500 | $70,000 |
| Underground Pretreatment Galleries | 1,375 | 43 | $137,500 | $193,500 | $331,000 |
| Pump Station | 1,420 | 44 | $142,000 | $198,000 | $340,000 |
| **Subtotal** | **3,090** | **96** | **$309,000** | **$432,000** | **$741,000** |

---

[1] Estimated based on an hourly labor rate of $100/hour

[2] Estimated based on a daily vaccum truck rental rate of $4,900/day

# APPENDIX A

## Example Field Forms

# Maintenance Field Log

Field Staff:______________________________________________________________ Date/Time:______________________________________________________________

**Date:** _______________ **Time:** _______________ **Maintenance Staff:** ____________________________________________________________

**Days since last rain event:** ____________________________________________ **Weather Conditions:** ____________________________________________________________

| **Drywells (Annually)** | Unit ID: | Unit ID: | Unit ID: | Unit ID: | Unit ID: | Unit ID: | Unit ID: | Unit ID: | Unit ID: |
|---|---|---|---|---|---|---|---|---|---|
| Vacuumed? (Y/N) | | | | | | | | | |
| Debris Shield Unclogged? (Y/N) | | | | | | | | | |
| Absorbent Sponge Replaced? (Y/N) | | | | | | | | | |
| Photos Taken? (Y/N) | | | | | | | | | |

| Additional Maintenance Documentation: | |
|---|---|
| Unit ID: | |
| Unit ID: | |
| Unit ID: | |
| Unit ID: | |
| Unit ID: | |
| Unit ID: | |
| Unit ID: | |
| Unit ID: | |
| Unit ID: | |

# Maintenance Field Log

Field Staff:________________________________________ Date/Time:________________________________________

**Date:** ____________ **Time:** ____________ **Maintenance Staff:** ________________________

**Days since last rain event:** ________________________ **Weather Conditions:** ________________________

| **Stormwater Vault and Cistern (Annually)** | Gallery ID: | Gallery ID: | Gallery ID: | Gallery ID: | Gallery ID: | Gallery ID: | Gallery ID: |
|---|---|---|---|---|---|---|---|
| Evidence of Obstruction? (Y/N) | | | | | | | |
| Depth of Sediment? | | | | | | | |
| Photos Taken? (Y/N) | | | | | | | |

| Additional Maintenance Documentation: | |
|---|---|
| Unit ID: | |
| Unit ID: | |
| Unit ID: | |
| Unit ID: | |
| Unit ID: | |
| Unit ID: | |
| Unit ID: | |

# APPENDIX B

## Reference Underground Pretreatment Gallery Maintenance Information

# O & M
# MANUALS

# STORMTRAP

# StormTrap Maintenance Manual

## 1. Introduction

Regular inspections are recommended to ensure that the system is functioning as designed. Please call your Authorized StormTrap Representative if you have questions in regards to the inspection and maintenance of the StormTrap system. Prior to entry into any underground storm sewer or underground detention systems, appropriate OSHA and local safety regulations and guidelines should be followed.

## 2. Inspection Schedules for Municipalities

StormTrap Stormwater Management Systems are recommended for inspection whenever the upstream and downstream catch basins and stormwater pipes of the stormwater collection system are inspected or maintained. This will economize the cost of the inspection if it is done at the same time the Municipal crews are visiting the area.

## 3. Inspection Schedules for Private Development

StormTrap Stormwater Mangement Systems, for a private development, are recommended for inspection after each major storm water event. At a minimum, until a cleaning schedule can be established, an annual inspection is recommended. If inspected on an annual basis, the inspection should be conducted before the stormwater season begins to be sure that everything is functioning properly for the upcoming storm season.

## 4. Inspection Process

Inspections should be done such that at least 2-3 days has lapsed since the most recent rain event to allow for draining. Visually inspect the system at all manhole locations. Utilizing a sediment pole, measure and document the amount of silt at each manhole location. Inspect each pipe opening to ensure that the silt level or any foreign objects are not blocking the pipes. Be sure to inspect the outlet pipe(s) because this is typically the smallest pipe in the system. It is common that most of the larger materials will be collected upstream of the system in catch basins, and it is therefore important at time of inspections to check these structures for large trash or blockages.

Remove any blockages if you can during the inspection process only if you can do so safely from the top of the system without entering into the system. **Do not go into the system under any circumstances** without proper ventilation equipment and training. Pass any information requiring action onto the appropriate maintenance personnel if you cannot remove the blockages from above during the inspection process. Be sure to describe the location of each manhole and the type of material that needs to be removed.

The sediment level of the system should also be measured and recorded during the inspection process. Recording the sediment level at each manhole is very important in order get a history of sediment that can be graphed over time (i.e. years) in order to estimate when the system will need to be maintained next. It is also important to keep these records to verify that the inspection process was actually performed if anyone asks for your records in the future.

The sediment level in the underground detention system can be determined from the outside of the system by opening up all the manholes and using a sediment pole to measure the amount of sediment at each location. Force the stick to the bottom of the system and then remove it and measure the amount of sediment at that location. Again, do not go into the system under any circumstances without proper ventilation equipment and training.

5. When to Clean the System

Any blockages should be safely removed as soon as practical so that the Stormwater detention system will fill and drain properly before the next stormwater event.

The Dry Detention System should be completely cleaned whenever the sediment occupies more than 10% to 15% of the originally designed system's volume. The Wet Detention System should be cleaned when the sediment occupies more than 30% or 1/3rd of the originally designed system's volume. NOTE: Check with your municipality in regards to cleaning criteria, as the allowable sediment before cleaning may be more or less then described above.

6. How to Clean the StormTrap

The system should be completely cleaned back to 100% of the originally designed storage volume whenever the above sediment levels have been reached. Be sure to wait at least 3 days after a stormwater event to be sure that the system is completely drained (if it is a Dry Detention System), and all of the sediments have settled to the bottom of the system (if it is a Wet Detention System).

Do not enter the System unless you are properly trained, equipped, and qualified to enter a confined space as identified by local occupational safety and health regulations.

There are many maintenance companies that are in business to help you clean your underground stormwater detention systems and water quality units. Please call your StormTrap representative for referrals in your area.

A. Dry Detention System Cleaning

Maintenance is typically performed using a vacuum truck. Sediment should be flushed towards a vacuum hose for thorough removal. For a Dry Detention System, remove the manhole cover at the top of the system and lower a vacuum hose into one of the rows of the StormTrap system. Open up the manhole at the opposite end of the StormTrap and use sewer jetting equipment to force water in the same row from one end of the StormTrap row to the opposite side. The rows of the StormTrap are completely open in one contiguous channel from one end to the other for easy cleaning.

Place the vacuum hose and the sewer jetting equipment in the next row and repeat the process until all of the rows have been cleaned.

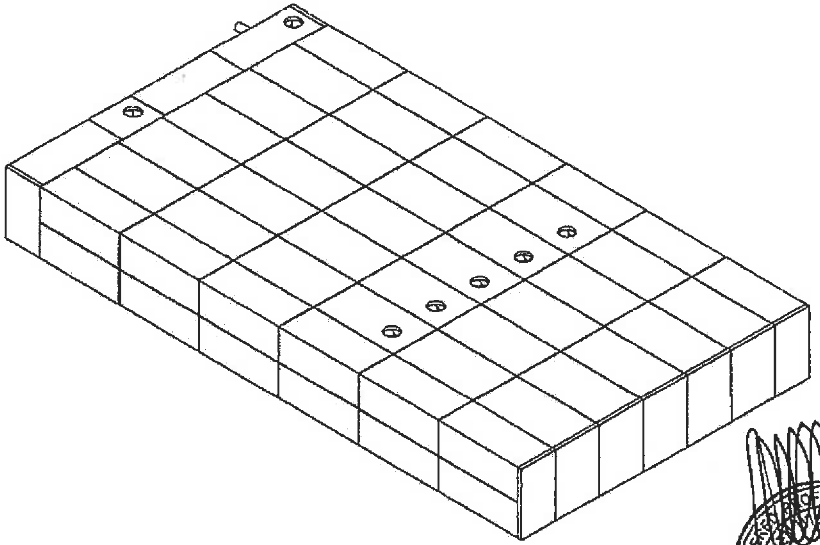
When finished, replace all covers that were removed and dispose of the collected material properly.

7. Proof of these inspections is the responsibility of the property owner. All inspection reports and data should be kept on site or at a location where they will be accessible for years in the future. Some municipalities require these inspection and cleaning reports to be forwarded to the proper governmental permitting agency on an annual basis.

Refer to your local and national regulations for any additional maintenance requirements and schedules not contained herein. Inspections should be a part of your standard operating procedure.

**STORMTRAP®**

Precast Concrete Modular Stormwater Management System



# BROADWAY NEIGHBORHOOD STORMWATER GREENWAY

## LOS ANGELES, CA

**STORMTRAP, LLC**

BY SIGNING THIS DOCUMENT YOU AGREE WITH THE INVERT ELEVATIONS, ACCESS OPENING SIZES AND LOCATIONS, PIPE DIAMETERS, PIPE MATERIAL, AND PIPE LOCATIONS OF THE DRAWINGS DATED 14-JULY-2015. IN ADDITION YOU AGREE WITH THE GENERAL LAYOUT OF THE BASIN AND BASIN HEIGHT, MIN AND MAX COVER OVER SYSTEM AND DELIVERY NOTES. THE STRUCTURAL INTEGRITY OF THE SYSTEM IS THE RESPONSIBILITY OF STORMTRAP.

GENERAL CONTRACTOR: ____________________ DATE: __/__/____

APPROVED: ☐ APPROVED WITH CHANGES: ☐ REJECTED: ☐

CIVIL ENGINEER: ____________________ DATE: __/__/____

APPROVED: ☐ APPROVED WITH CHANGES: ☐ REJECTED: ☐

INSTALLING CONTRACTOR: ____________________ DATE: __/__/____

APPROVED: ☐ APPROVED WITH CHANGES: ☐ REJECTED: ☐

### DESIGN ASSUMPTIONS

COVER: MIN: 9.4' - MAX: 10.5'
GROUNDWATER TABLE: BELOW THE SYSTEMS INVERT
SOIL PRESSURE: 3000 PSF
LOADING: AASHTO HS-20 HIGHWAY LOADING

### SHEET INDEX

| PAGE | DESCRIPTION | REV. |
|---|---|---|
| 0.0 | COVER SHEET | 7 |
| 1.0 | DOUBLETRAP INSTALLATION SPECIFICATIONS | 7 |
| 2.0 | DOUBLETRAP INSTALLATION SPECIFICATIONS | 7 |
| 3.0 | DETAIL LAYOUT | 7 |
| 4.0 | STANDARD - 11'-0" DOUBLETRAP UNIT TYPES | 7 |

### JOB SITE INFORMATION

**DESCRIPTION**

JOB NAME: BROADWAY NEIGHBORHOOD STORMWATER GREENWAY

ENGINEERING COMPANY: GEOSYNTEC CONSULTANTS
CONTACT NAME: REBECCA BATCHELDER
CONTACT PHONE: 310-957-6100
CONTACT FAX: 310-957-6101

STORM TRAP SUPPLIER: STORMTRAP
CONTACT NAME: NATHAN TOWLERTON
CONTACT PHONE: 562-382-3000
CONTACT EMAIL: NTOWLERTON@STORMTRAP.COM

WATER STORAGE REQ'D: 55,000.00 CUBIC FEET

WATER STORAGE PROV: 56,540.00 CUBIC FEET

UNIT HEADROOM: 11'-0" DOUBLETRAP

UNIT QUANTITY: 92 TOTAL PIECES

SCHAUB
No. C41570
EXP. 6/30/2017
CIVIL

JUL 14 2015

**STORMTRAP**
2495 WEST BUNGALOW ROAD
MORRIS, IL 60450
P: 815-941-4663
F: 815-416-1100

GEOSYNTEC CONSULTANTS
3415S SEPULVEDA BLVD STE500
LOS ANGELES, CA 90034
Phone: 310-957-6100
Fax: 310-957-6101

BROADWAY NEIGHBORHOOD STORMWATER GREENWAY
LOS ANGELES, CA

DATE: 14-JULY-2015

APPROVED BY:

ISSUED FOR: APPROVAL

| REV. | DATE: | DESC. | DWG. |
|---|---|---|---|
| 7 | 14-JULY-2015 | ISSUED FOR APPROVAL | DJG |
| 6 | 17-JUN-2015 | ISSUED FOR APPROVAL | JPH |
| 5 | 5-MAY-2015 | ISSUED FOR APPROVAL | JPH |
| 4 | 24-MAR-2015 | ISSUED FOR PRELIMINARY | JPH |
| 3 | 11-SEP-2014 | ISSUED FOR PRELIMINARY | JPH |
| 2 | 09-JUL-2014 | ISSUED FOR PRELIMINARY | JPH |
| 1 | 10-JUN-2014 | ISSUED FOR PRELIMINARY | JPH |

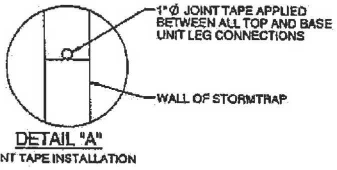
SCALE: NTS

SHEET TITLE: COVER SHEET

SHEET NUMBER: **0.0**

## STORMTRAP INSTALLATION SPECIFICATION

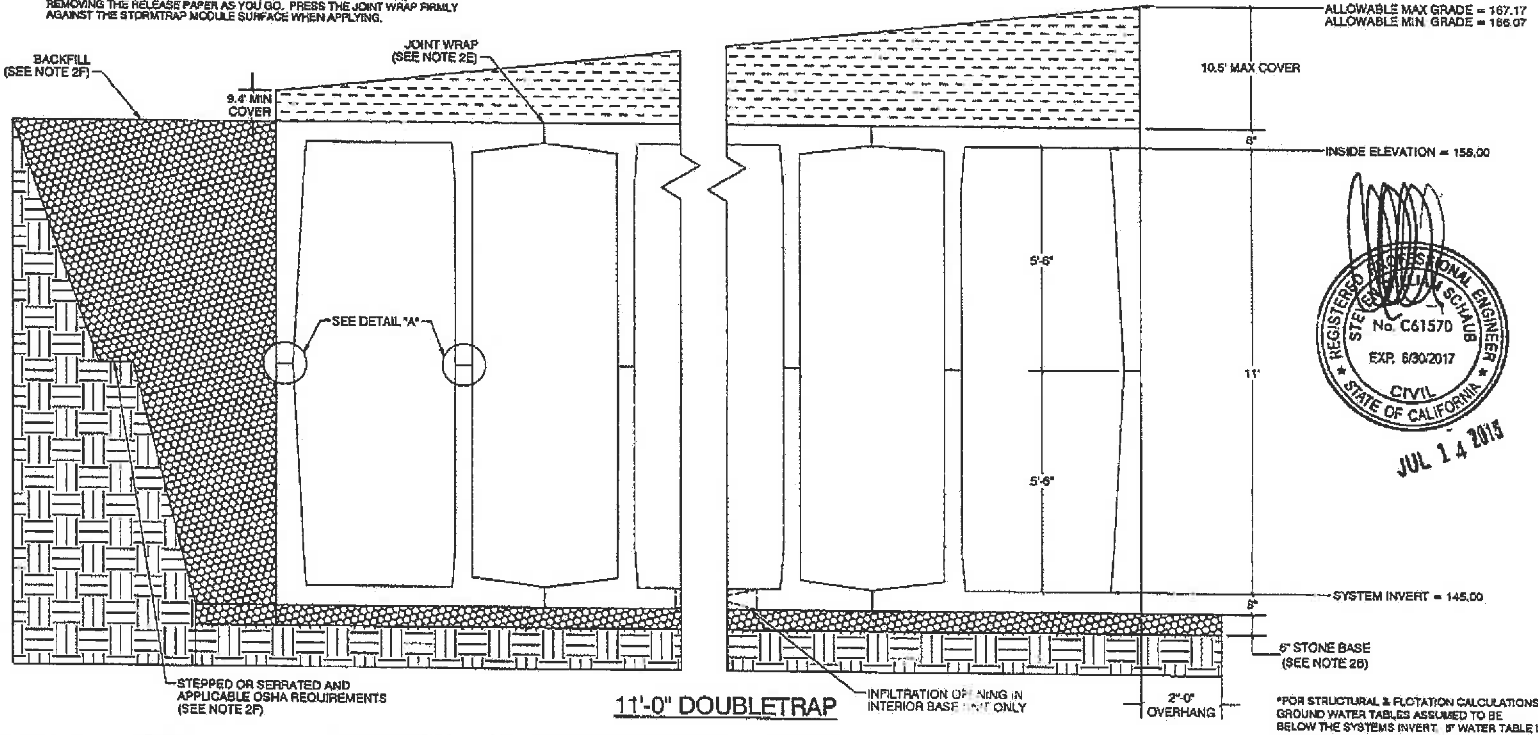
1. STORMTRAP MODULES SHALL BE MANUFACTURED ACCORDING TO SHOP DRAWINGS APPROVED BY THE INSTALLING CONTRACTOR AND ENGINEER. THE SHOP DRAWINGS SHALL INDICATE SIZE AND LOCATION OF ROOF OPENINGS AND INLET/ OUTLET PIPE OPENINGS.
2. STORMTRAP SHALL BE INSTALLED IN ACCORDANCE WITH ASTM C891-09, STANDARD PRACTICE FOR INSTALLATION OF UNDERGROUND PRECAST CONCRETE UTILITY STRUCTURES. THE FOLLOWING ADDITIONS AND/OR EXCEPTIONS SHALL APPLY:
   - A. SPECIFICATIONS ON THE ENGINEER'S DRAWINGS SHALL TAKE PRECEDENCE.
   - B. STORMTRAP MODULES SHALL BE PLACED ON A LEVEL PAD OF 3/4" AGGREGATE, THAT EXTENDS 2'-0" PAST THE OUTSIDE OF THE SYSTEM, PER ASTM C891-09 STANDARD PRACTICE FOR INSTALLATION OF UNDERGROUND PRECAST CONCRETE UTILITY STRUCTURES.
   - C. THE STORMTRAP MODULES SHALL BE PLACED SUCH THAT THE MAXIMUM SPACE BETWEEN ADJACENT MODULES DOES NOT EXCEED 3/4". IF THE SPACE EXCEEDS 3/4", THE MODULES SHALL BE RESET WITH APPROPRIATE ADJUSTMENT MADE TO LINE AND GRADE TO BRING THE SPACE INTO SPECIFICATION.
   - D. THE HORIZONTAL JOINT BETWEEN THE TOP AND BASE UNIT LEG CONNECTION OF THE STORMTRAP MODULES SHALL BE SEALED TO THE FOUNDATION WITH PREFORMED MASTIC JOINT SEALER ACCORDING TO ASTM C891-09, 8.5 AND 8.12. SEE DETAIL "A"
   - E. ALL EXTERIOR AND INTERIOR JOINTS BETWEEN ADJACENT STORMTRAP MODULES SHALL BE SEALED WITH 0'-8" PRE-FORMED, COLD-APPLIED, SELF-ADHERING ELASTOMERIC RESIN BONDED TO A WOVEN HIGHLY PUNCTURE RESISTANT POLYMER WRAP CONFORMING TO ASTM C891-09 AND SHALL BE 0'-8" INTEGRATED PRIMER SEALANT AS APPROVED BY STORMTRAP. THE ADHESIVE EXTERIOR JOINT WRAP SHALL BE INSTALLED ACCORDING TO THE FOLLOWING INSTALLATION INSTRUCTIONS:
     1. USE A BRUSH OR WET CLOTH TO THOROUGHLY CLEAN THE OUTSIDE SURFACE AT THE POINT WHERE THE JOINT WRAP IS TO BE APPLIED.
     2. A RELEASE PAPER PROTECTS THE ADHESIVE SIDE OF THE JOINT WRAP. PLACE THE ADHESIVE TAPE (BUTYL SIDE DOWN) AROUND THE STRUCTURE, REMOVING THE RELEASE PAPER AS YOU GO. PRESS THE JOINT WRAP FIRMLY AGAINST THE STORMTRAP MODULE SURFACE WHEN APPLYING.
   - F. THE FILL PLACED AROUND THE STORMTRAP UNITS MUST BE DEPOSITED ON BOTH SIDES AT THE SAME TIME AND TO APPROXIMATELY THE SAME ELEVATION. AT NO TIME SHALL THE FILL BEHIND ONE SIDE WALL BE MORE THAN 2'-0" HIGHER THAN THE FILL ON THE OPPOSITE SIDE. BACKFILL SHALL BE COMPACTED TO 95% STANDARD PROCTOR DENSITY OR OTHERWISE SPECIFIED BY ENGINEER. CARE SHALL BE TAKEN TO PREVENT ANY WEDGING ACTION AGAINST THE STRUCTURE, AND ALL SLOPES BOUNDING OR WITHIN THE AREA TO BE BACKFILLED MUST BE STEPPED OR SERRATED TO PREVENT WEDGE ACTION. (REFERENCE ARTICLE 502.10 I.D.O.T. S.S.R.B.C.) CARE SHALL ALSO BE TAKEN AS NOT TO DISRUPT THE JOINT WRAP FROM THE JOINT DURING THE BACKFILL PROCESS. BACKFILL MATERIAL SHALL BE CLEAN, CRUSHED, ANGULAR No.5 (AASHTO M43) AGGREGATE.



DETAIL "A"
JOINT TAPE INSTALLATION

## STORMTRAP SPECIFICATION

1. TOTAL COVER: MIN. 9.4' MAX. 10.5' CONSULT STORMTRAP FOR ADDITIONAL COVER OPTIONS.
2. CONCRETE CHAMBER DESIGNED FOR AASHTO HS-20 HIGHWAY LOADING. MIN. SOIL PRESSURE 3000 PSF.
3. ALL DIMENSIONS AND SOIL CONDITIONS, INCLUDING BUT NOT LIMITED TO GROUNDWATER AND SOIL BEARING CAPACITY ARE TO BE VERIFIED IN THE FIELD BY OTHERS PRIOR TO STORMTRAP INSTALLATION.
4. FOR STRUCTURA CALCULATIONS THE GROUND WATER TABLE IS ASSUMED TO BE BELOW THE SYSTEMS INVERT. IF WATER TABLE IS DIFFERENT THAN ASSUMED, CONTACT STORMTRAP.
5. FOR STRUCTURAL CALCULATIONS THE SOIL DENSITY IS ASSUMED TO BE 120 PCF.
6. FOR FLOTATION CALCULATIONS THE GROUND WATER TABLE IS ASSUMED TO BE BELOW THE SYSTEMS INVERT. IF WATER TABLE IS DIFFERENT THAN ASSUMED, CONTACT STORMTRAP.
7. STORMTRAP IS NOT WATERTIGHT. CONTACT STORMTRAP FOR WATERTIGHT OPTIONS. WATERTIGHT APPLICATION TO BE PROVIDED BY OTHERS.



11'-0" DOUBLETRAP

*FOR STRUCTURAL & FLOTATION CALCULATIONS THE GROUND WATER TABLES ASSUMED TO BE BELOW THE SYSTEMS INVERT. IF WATER TABLE IS DIFFERENT THAN ASSUMED, CONTACT STORMTRAP.

STEVEN SCHAUB
No. C61570
EXP. 6/30/2017
CIVIL

JUL 14 2015

STORMTRAP
2495 WEST BUNGALOW ROAD
MORRIS, IL 60450
P: 815-941-4663
F: 815-416-1100

GEOSYNTEC
CONSULTANTS

3415S SEPULVEDA BLVD STE500
LOS ANGELES, CA 90034
Phone: 310-957-6100
Fax: 310-957-6101

BROADWAY
NEIGHBORHOOD
STORMWATER
GREENWAY

LOS ANGELES, CA

DATE:
14-JULY-2015

APPROVED BY:

ISSUED FOR:
APPROVAL

| REV. | DATE: | DESC. | DWG. |
|---|---|---|---|
| 7 | 14-JULY-2015 | ISSUED FOR APPROVAL | DJG |
| 6 | 17-JUN-2015 | ISSUED FOR APPROVAL | JPH |
| 5 | 5-MAY-2015 | ISSUED FOR APPROVAL | JPH |
| 4 | 24-MAR-2015 | ISSUED FOR PRELIMINARY | JPH |
| 3 | 11-SEP-2014 | ISSUED FOR PRELIMINARY | JPH |
| 2 | 08-JUL-2014 | ISSUED FOR PRELIMINARY | JPH |
| 1 | 12-JUN-2014 | ISSUED FOR PRELIMINARY | JPH |

SCALE:
NTS

SHEET TITLE:
DOUBLETRAP
INSTALLATION
SPECIFICATIONS

SHEET NUMBER:
1.0

## RECOMMENDED ACCESS OPENING SPECIFICATION

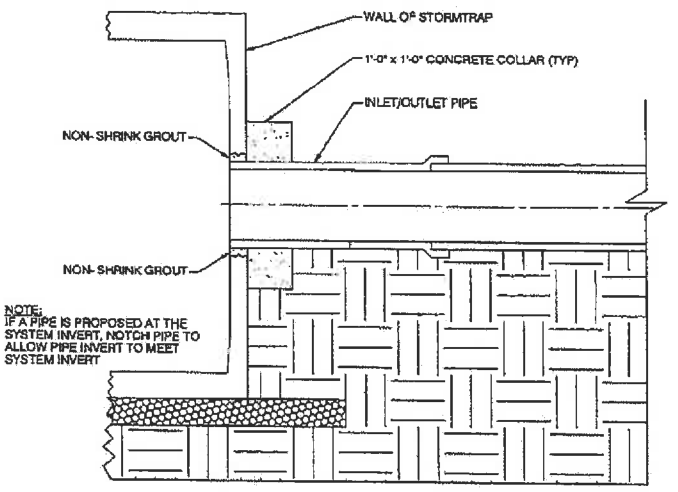
1. A TYPICAL ACCESS OPENING FOR THE STORMTRAP SYSTEM ARE 2'-6" IN DIAMETER. ACCESS OPENINGS LARGER THAN 2'-6" IN DIAMETER NEED TO BE APPROVED BY STORMTRAP. ALL OPENINGS MUST RETAIN AT LEAST 1'-0" OF CLEARANCE IN ALL DIRECTIONS FROM THE EDGE OF THE STORMTRAP UNITS.
2. PLASTIC COATED STEEL STEPS PRODUCED BY M.A. INDUSTRIES PART #PS3-PFC (SEE DETAIL TO THE RIGHT) ARE PROVIDED INSIDE ANY UNIT WHERE DEEMED NECESSARY. THE HIGHEST STEP IN THE UNIT IS TO BE PLACED A DISTANCE OF 1'-0" FROM THE INSIDE EDGE OF THE STORMTRAP UNITS. ALL ENSUING STEPS SHALL BE PLACED WITH A MAXIMUM DISTANCE OF 1'-4" BETWEEN THEM. STEPS MAY BE MOVED OR ALTERED TO AVOID OPENINGS OR OTHER IRREGULARITIES IN THE UNIT.
3. STORMTRAP LIFTING INSERTS MAY BE RELOCATED TO COINCIDE WITH THE ACCESS OPENING OR THE CENTER OF GRAVITY OF THE UNIT AS NEEDED.
4. STORMTRAP ACCESS OPENINGS MAY BE RELOCATED TO AVOID INTERFERENCE WITH INLET AND/OR OUTLET PIPE OPENINGS SO PLACEMENT OF STEPS IS ATTAINABLE.
5. ACCESS OPENINGS SHOULD BE LOCATED IN ORDER MEET THE APPROPRIATE MUNICIPAL REQUIREMENTS. STORMTRAP RECOMMENDS AT LEAST ONE ACCESS OPENING PER SYSTEM FOR ACCESS AND INSPECTION.
6. USE PRECAST ADJUSTING RINGS AS NEEDED TO MEET GRADE. STORMTRAP RECOMMENDS FOR COVER OVER 2' TO USE PRECAST BARREL OR CONE SECTIONS. (BY OTHERS)

## RECOMMENDED PIPE OPENING SPECIFICATION

1. MINIMUM EDGE DISTANCE FOR AN OPENING ON THE OUTSIDE WALL SHALL BE NO LESS THAN 1'-0".
2. MAXIMUM OPENING SIZE TO BE DETERMINED BY UNIT HEIGHT. PREFERRED OPENING SIZE Ø36" OR LESS. ANY OPENING NEEDED THAT DOES NOT FIT THIS CRITERIA SHALL BE BROUGHT TO THE ATTENTION OF STORMTRAP FOR REVIEW.
3. CONNECTING PIPES SHALL BE INSTALLED WITH A 1'-0" CONCRETE COLLAR, AND A AGGREGATE CRADLE FOR AT LEAST ONE PIPE LENGTH, AS SHOWN. A STRUCTURAL GRADE CONCRETE OR GROUT WITH A MINIMUM 28 DAY COMPRESSIVE STRENGTH OF 3000 PSI SHALL BE USED.
4. THE ANNULAR SPACE BETWEEN THE PIPE AND THE HOLE SHALL BE FILLED WITH NON-SHRINK GROUT.

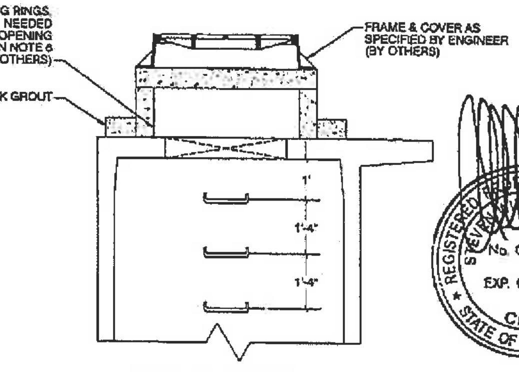
## RECOMMENDED PIPE INSTALLATION INSTRUCTIONS

1. CLEAN AND LIGHTLY LUBRICATE ALL OF PIPE TO BE INSERTED INTO STORMTRAP.
2. IF PIPE IS CUT, CARE SHOULD BE TAKEN TO ALLOW NO SHARP EDGES. BEVEL AND LUBRICATE LEAD END OF PIPE.
3. ALIGN CENTER OF PIPE TO CORRECT ELEVATION AND INSERT INTO OPENING.

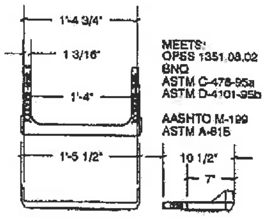


NOTE:
IF A PIPE IS PROPOSED AT THE SYSTEM INVERT, NOTCH PIPE TO ALLOW PIPE INVERT TO MEET SYSTEM INVERT

FOUNDATION
PIPE CONNECTION



RISER / STAIR DETAIL



MEETS:
OPSS 1351.08.02
BNQ
ASTM C-478-95a
ASTM D-4101-95b

AASHTO M-199
ASTM A-615

STAIR DETAIL

No. C61570
EXP. 6/30/2017
JUL 14 2015

**STORMTRAP**
2495 WEST BUNGALOW ROAD
MORRIS, IL 60450
P: 815-941-4663
F: 815-416-1100

GEOSYNTEC
CONSULTANTS
3415S SEPULVEDA BLVD STE500
LOS ANGELES, CA 90034
Phone: 310-957-6100
Fax: 310-957-6101

BROADWAY
NEIGHBORHOOD
STORMWATER
GREENWAY

LOS ANGELES, CA

DATE:
14-JULY-2015

APPROVED BY:

ISSUED FOR:
APPROVAL

| REV. | DATE: | DESC. | DWG. |
|---|---|---|---|
| 7 | 14-JULY-2015 | ISSUED FOR APPROVAL | DJG |
| 6 | 17-JUN-2015 | ISSUED FOR APPROVAL | JPH |
| 5 | 5-MAY-2015 | ISSUED FOR APPROVAL | JPH |
| 4 | 24-MAR-2015 | ISSUED FOR PRELIMINARY | JPH |
| 3 | 11-SEP-2014 | ISSUED FOR PRELIMINARY | JPH |
| 2 | 08-JUL-2014 | ISSUED FOR PRELIMINARY | JPH |
| 1 | 13-JUN-2014 | ISSUED FOR PRELIMINARY | JPH |

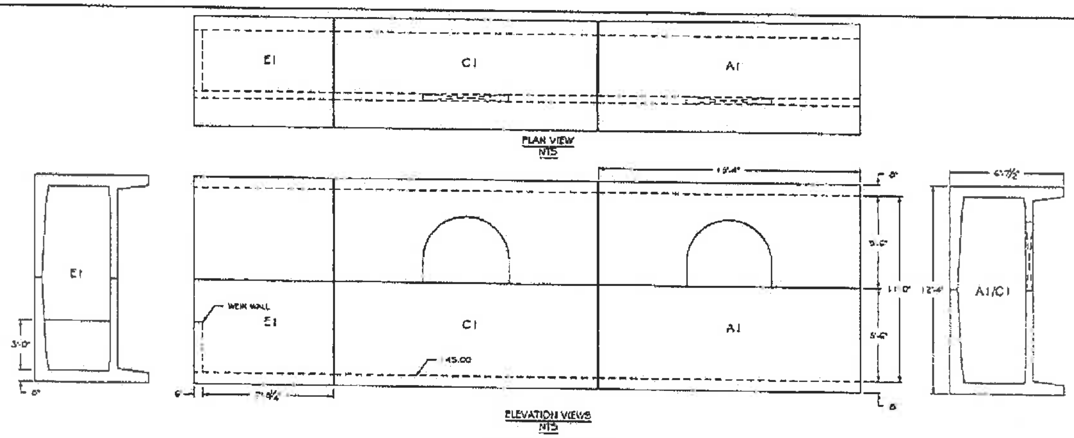
SCALE:
NTS

SHEET TITLE:
RECOMMENDED
DOUBLELETRAP
INSTALLATION
SPECIFICATIONS

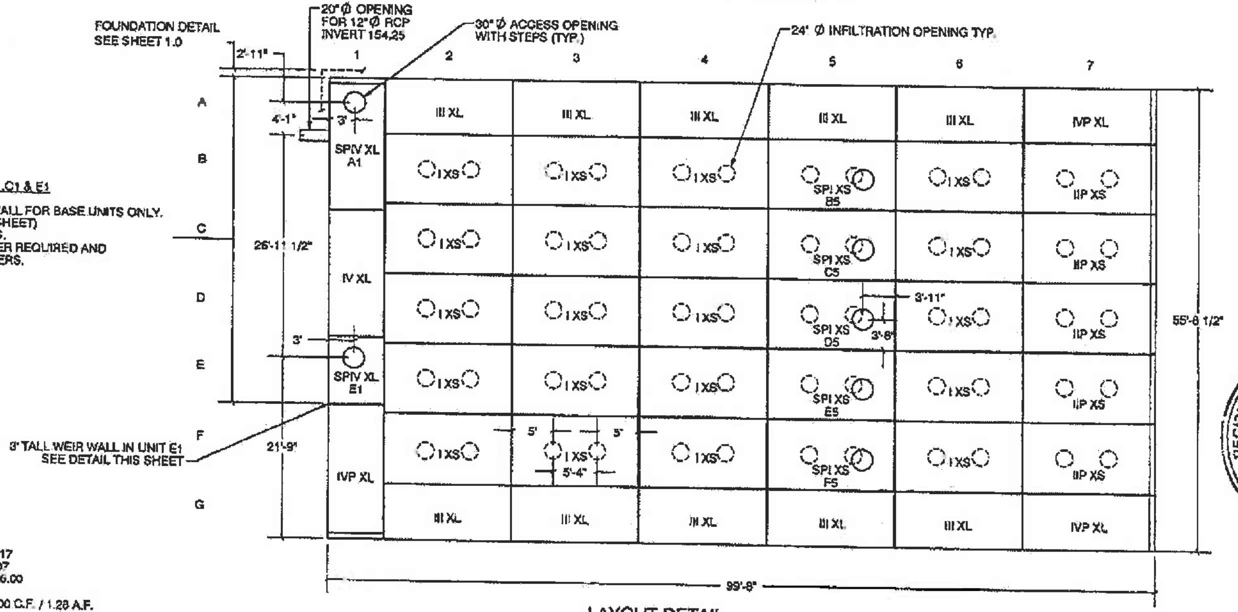
SHEET NUMBER:
2.0

## BILL OF MATERIALS

| QTY. | UNIT TYPE | DESCRIPTION | TOP WEIGHT | BASE WEIGHT |
|---|---|---|---|---|
| 25 | I XS | 11'-0" DOUBLETRAP | 19026 | 18824 |
| 5 | II XS | 11'-0" DOUBLETRAP | 21775 | 21573 |
| 10 | III XL | 11'-0" DOUBLETRAP | 20654 | 20553 |
| 4 | IV XL | 11'-0" DOUBLETRAP | 22029 | 21928 |
| 1 | SPIV XL | 11'-0" DOUBLETRAP | VARIES | |
| 9 | PANEL | 8" THICK WALL PANELS | VARIES | |
| 9 | JOINTWRAP | 150' PER ROLL | | |
| 58 | JOINTTAPE | 14.5' PER ROLL | | |



WEIR WALL DETAIL



LAYOUT DETAIL

NOTES FOR UNITS A1,C1 & E1

1. INTERNAL SOLID WALL FOR BASE UNITS ONLY. (SEE DETAIL THIS SHEET)
2. NO FORK POCKETS.
3. IMPERMEABLE LINER REQUIRED AND PROVIDED BY OTHERS.

DESIGN CRITERIA

ALLOWABLE MAX GRADE = 167.17
ALLOWABLE MIN GRADE = 166.07
INSIDE HEIGHT ELEVATION = 156.00
SYSTEM INVERT = 145.00
STORMTRAP VOLUME = 55,540.00 C.F. / 1.28 A.F.

NOTES:

1. DIMENSION OF STORMTRAP SYSTEM ALLOW FOR A 3/4" GAP BETWEEN EACH UNIT.
2. ALL DIMENSIONS TO BE VERIFIED IN THE FIELD BY OTHERS.
3. SEE SHEET 2 FOR INSTALLATION SPECIFICATIONS.

N

STORMTRAP
2495 WEST BUNGALOW ROAD
MORRIS, IL 60450
P: 815-941-4663
F: 815-416-1100

GEOSYNTEC
CONSULTANTS
3415S SEPULVEDA BLVD STE500
LOS ANGELES, CA 90034
Phone: 310-957-6100
Fax: 310-957-6101

BROADWAY
NEIGHBORHOOD
STORMWATER
GREENWAY
LOS ANGELES, CA

DATE:
14-JULY-2015

APPROVED BY:

ISSUED FOR:
APPROVAL

| REV. | DATE: | DESC. | DWG. |
|---|---|---|---|
| 7 | 14-JULY-2015 | ISSUED FOR APPROVAL | DJG |
| 6 | 17-JUN-2015 | ISSUED FOR APPROVAL | JPH |
| 5 | 5-MAY-2015 | ISSUED FOR APPROVAL | JPH |
| 4 | 24-MAR-2015 | ISSUED FOR PRELIMINARY | JPH |
| 3 | 11-SEP-2014 | ISSUED FOR PRELIMINARY | JPH |
| 2 | 28-JUL-2014 | ISSUED FOR PRELIMINARY | JPH |
| 1 | 13-JUN-2014 | ISSUED FOR PRELIMINARY | JPH |

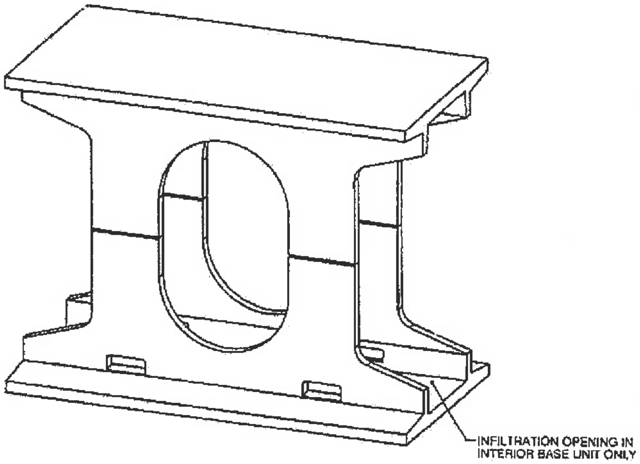
SCALE:
NTS

SHEET TITLE:
LAYOUT DETAIL

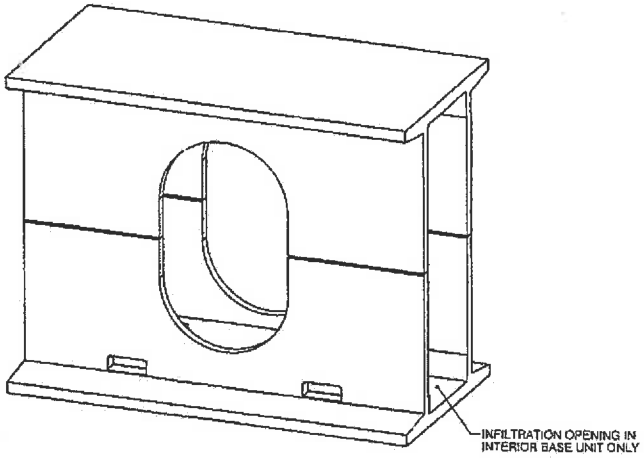
SHEET NUMBER:
3.0

No. C61570
EXP. 6/30/2017
JUL 14 2015

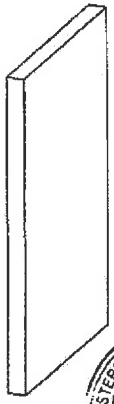
TYPE I



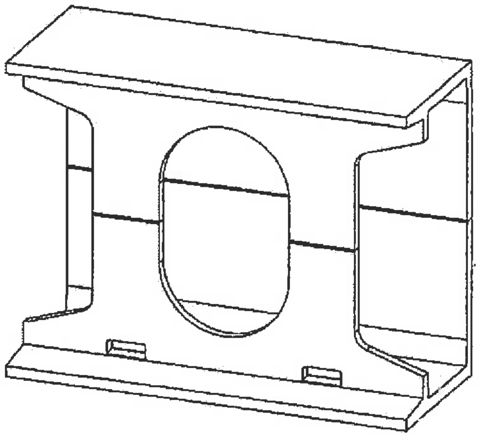
TYPE II



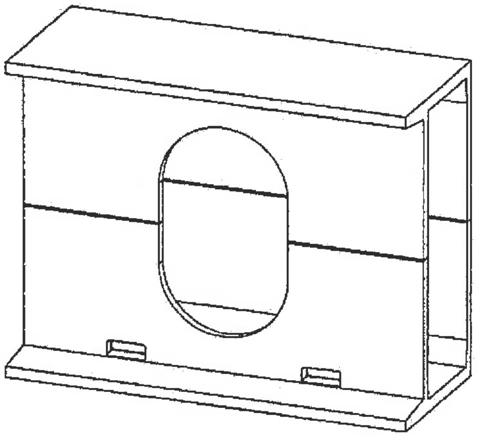
TYPE II PANEL



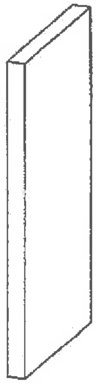
TYPE III



TYPE IV



TYPE IV PANEL



NOTES:

1. OPENING LOCATIONS VARY ON UNIT HEIGHT AND LENGTHS.
2. SP - INDICATES A UNIT WITH MODIFICATIONS.
3. P - INDICATES A UNIT WITH A PANEL ATTACHEMENT.
4. POCKET WINDOW OPENINGS ARE OPTIONAL.

No. C61570
EXP. 6/30/2017
CIVIL

JUL 14 2015

**STORMTRAP**
2495 WEST BUNGALOW ROAD
MORRIS, IL 60450
P: 815-941-4663
F: 815-416-1100

GEOSYNTEC
CONSULTANTS

3415S SEPULVEDA BLVD STE500
LOS ANGELES, CA 90034
Phone: 310-957-6100
Fax: 310-957-6101

BROADWAY
NEIGHBORHOOD
STORMWATER
GREENWAY

LOS ANGELES, CA

DATE:
14-JULY-2015

APPROVED BY:

ISSUED FOR:
APPROVAL

| REV. | DATE: | DESC. | DWG. |
|---|---|---|---|
| 7 | 14-JULY-2015 | ISSUED FOR APPROVAL | DJG |
| 6 | 17-JUN-2015 | ISSUED FOR APPROVAL | JPH |
| 5 | 5-MAY-2015 | ISSUED FOR APPROVAL | JPH |
| 4 | 24-MAR-2015 | ISSUED FOR PRELIMINARY | JPH |
| 3 | 11-SEP-2014 | ISSUED FOR PRELIMINARY | JPH |
| 2 | 08-JUL-2014 | ISSUED FOR PRELIMINARY | JPH |
| 1 | 13-JUN-2014 | ISSUED FOR PRELIMINARY | JPH |

SCALE:
NTS

SHEET TITLE:
11'-0" DOUBLETRAP
UNIT TYPES

SHEET NUMBER:
4.0

STORMTRAP® PATENTED

Precast Concrete Modular Stormwater Management System

# WARRANTY

## 8.1 Warranty Statements

1. StormTrap LLC warrants to the Purchaser that the StormTrap® modules, when installed strictly in accordance with StormTrap LLC's written installation instructions, are of the quality set forth in the specifications published by StormTrap LLC for such module for a warranty period of 5 years. The warranty period shall commence starting the last day of installation of any module.
2. StormTrap LLC further warrants to the Purchaser that the products to be delivered hereunder shall be free of defects in materials and workmanship in normal use and service for a warranty period of 5 years.

## 8.2 Limits to Warranty

1. This is a Limited Warranty that applies solely to the precast concrete StormTrap® modules and is exclusive and in lieu of all other warranties (whether expressed, implied, or statutory). **EXCEPT AS SET FORTH IN THE WARRANTY STATEMENTS, STORMTRAP LLC MAKES NO EXPRESS OR IMPLIED WARRANTY THAT THE PRODUCTS SOLD HEREUNDER ARE OF MERCHANTABLE QUALITY, ARE FIT FOR**

**ANY PARTICULAR PURPOSE, COMPLY WITH REQUIREMENTS OF ANY SAFETY CODE OR COMPLY WITH THE LAWS AND REGULATIONS OF ANY STATE, MUNICIPALITY OR OTHER JURISDICTION.**

### 8.3 Limits to Beneficiaries and Damages and Claims

1. This limited warranty is given only to the Purchaser. It may not be assigned to any party other than Purchaser and there are no third party beneficiaries to this limited warranty.
2. **IN NO EVENT SHALL StormTrap LLC BE LIABLE FOR SPECIAL, INDIRECT, ECONOMIC, INCIDENTAL, EXEMPLARY, PUNITIVE OR CONSEQUENTIAL DAMAGES, AND StormTrap LLC SHALL NOT BE LIABLE FOR PENALTIES OR LIQUIDATED DAMAGES, INCLUDING LOSS OF PRODUCTION AND PROFITS, LABOR AND MATERIALS, OVERHEAD COSTS, OR ANY LOSS OR EXPENSE INCURRED BY THE PURCHASER OR ANY THIRD PARTY.**
3. StormTrap LLC's obligation under this warranty shall not include any freight or transportation charges or costs of installation.
4. **StormTrap LLC's TOTAL LIABILITY TO PURCHASER SHALL IN NO EVENT EXCEED THE PURCHASE PRICE OF THE StormTrap® MODULES IN RESPECT TO WHICH ANY CLAIM UNDER THIS WARRANTY ARISES, OR FOR ANY AND ALL CLAIMS ARISING OUT OF ANY CAUSE WHATSOEVER, WHETHER BASED IN CONTRACT, NEGLIGENCE OR OTHER TORT STRICT LIABILITY OR OTHERWISE.**
5. **THIS LIMITED WARRANTY IS THE EXCLUSIVE REMEDY FOR PURCHASER WITH RESPECT TO THE StormTrap® MODULES.** StormTrap LLC shall not be liable to the Purchaser or to any third party for any other product liability claims; claims arising from design, shipment, or installation of the StormTrap® modules, or the cost of other goods or services related to the purchase and installation of the StormTrap® modules.

### 8.4 Limitations Due to Installation, Handling and Use

1. For this Limited Warranty to apply, the StormTrap® modules must be installed in accordance with all conditions required by state and local codes; all other applicable laws and regulations; and StormTrap LLC's written installation instructions.
2. This warranty shall not apply to any StormTrap® modules which have been subjected to damage from abuse or mishandling, or which have been repaired or modified by anyone other than StormTrap LLC.
2. Excluded from this limited warranty are damages due to alteration, accident, misuse, abuse or neglect; the StormTrap® modules being subject to conditions which are not permitted by StormTrap LLC's design criteria or installation instructions; such as but not limited to failure to maintain the minimum cover or exceed the maximum cover to grade set forth in the design criteria or installation instructions; failure to install within tolerance and set true to line and grade as set forth in the specifications or installation instructions; the placement of improper bedding or backfill materials; improper installation, bedding, or backfill techniques; failure of the product due to improper application or improper sizing; or any other event not caused by StormTrap LLC.

### 8.5 No Other Expressed Warranty

1. Except as specified herein, no other expressed warranty is given and no affirmation on Seller's part or on the part of Seller's representatives or agents, by work or act, shall constitute a warranty.
2. No representative of StormTrap LLC has the authority to change this Limited Warranty in any manner or to extend this Limited Warranty, unless written confirmation is provided by an officer of StormTrap LLC.

### 8.6 Remedies

1. If a breach of this warranty shall become apparent to the purchaser, the purchaser has the responsibility to provide StormTrap LLC with prompt written notice of the alleged breach at StormTrap LLC's company headquarters. This notice shall be provided within 30 days of the discovery of the alleged defect and shall describe it in detail. **AS THE SOLE AND EXCLUSIVE REMEDY TO PURCHASER FOR SUCH BREACH, StormTrap LLC AGREES TO PROVIDE REPLACEMENT MODULES OR REPAIR THOSE MODULES DETERMINED BY StormTrap LLC TO BE DEFECTIVE AND COVERED BY THIS LIMITED WARRANTY.** Removal and/or installation of the replacement modules is the responsibility of the purchaser and specifically excluded by StormTrap LLC.

# APPENDIX C

## Reference Drywell Maintenance Information

# Maintenance

The responsible property owner, such as a Property Management Company or Homeowners Association, is responsible for maintaining the drywell(s) after development.

Standing water problems are usually caused by inadequate performance of the existing drainage systems on the property. Reasons are varied but may be due to system aging, reduced soil permeability, inefficient or outdated design, pavement settlement, ineffective site maintenance, property expansions and additions, or changed property usage.

If a drywell is draining slowly or water stands on the surface for longer than regulations allow, debris may simply be blocking the inlet. The maintenance guidelines begin with the performance of an annual inspection which will include assessing the need for cleaning, and inspecting the functional and structural continuity of the system. At the same time, surface aspects of the drainage way are evaluated for evidence of staining or standing water.

Cleaning with a truck-mounted hydro-vactor (see below) is recommended when silt and sediment are found to occupy 15% or more of the original effective settling capacity of the inlet chamber. The maintenance operation utilizes air and high-pressure water to dislodge this built-up material, which is then suctioned through a piping system into the vactor truck and disposed of off-site.

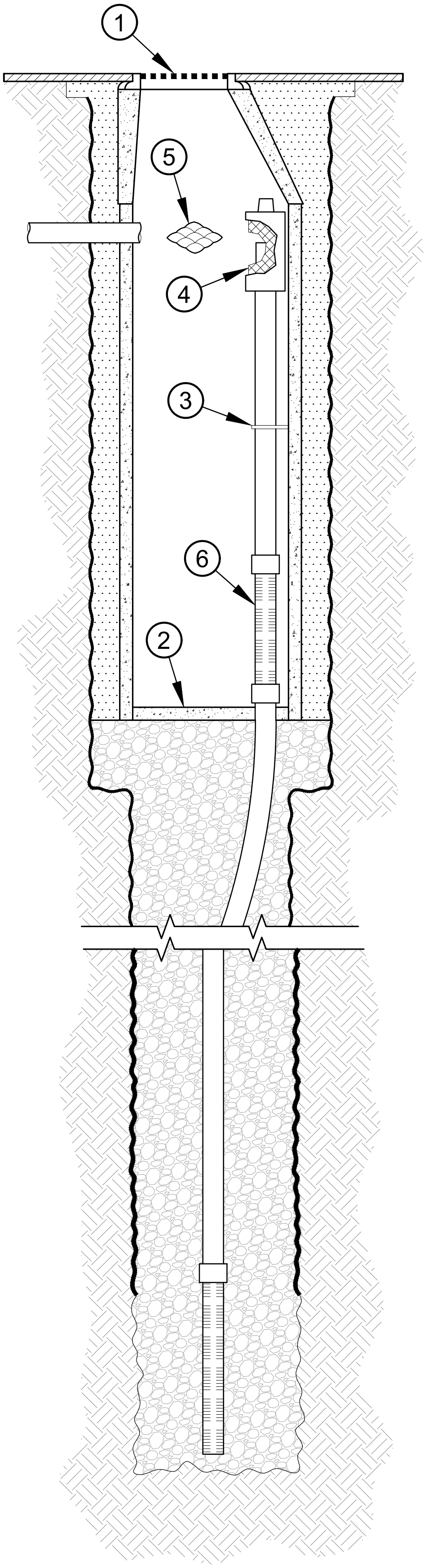
Inlet grates and covers are removed for this operation, and all filters and screens are serviced during this procedure. At the same time, any obstructions or accumulated debris in remote inlets and connecting piping is removed by jet-rodding. The cleaning operation also involves replacement of the floating absorbent pillows and changing out the filter fabric at the bottom of the chambers, if so equipped. If there are no obvious blockages noted during the inspection procedure, it is possible that a thorough cleaning may restore the well to optimal service.

After the initial cleaning, most systems generally will not require subsequent cleaning for 3-5 years. If afforded reasonable maintenance practices, our records indicate that our MaxWell Drywells will provide many years of efficient, reliable service.

Typical Hydrovactor Truck used for Drywell Maintenance

# INSPECTION AND MAINTENANCE PROCEDURES FOR MAXWELL IV DRYWELL

TORRENT RESOURCES



**RECOMMENDED INSPECTION PROCEDURES**
NEW INSTALLS - ALL NEW DRYWELLS SHOULD BE INSPECTED AFTER THE FIRST FEW RAINFALLS TO ENSURE SYSTEM IS FUNCTIONING PROPERLY AND TO GET A SENSE OF HOW QUICKLY SEDIMENT, TRASH, AND DEBRIS IS ACCUMULATING.

ONGOING OPERATION - INSPECT SYSTEM PRIOR TO THE BEGINNING OF EACH RAINY SEASON (AUGUST/SEPTEMBER) OR ONCE ANNUALY. RECORD INSPECTON OBSERVATIONS IN MAINTENANCE LOG BOOK.

**RECOMMENDED MAINTENANCE**
DRYWELL SHOULD BE CLEANED WHEN THERE IS AT LEAST 2' OF ACCUMULATION OF SEDIMENT, TRASH, AND DEBRIS.

SPECIFIC MAINTENANCE POINTS ARE SHOWN BELOW:

## ○ ITEM NUMBERS

1. REMOVE, CLEAN, AND REPLACE MANHOLE GRATE.
2. LOOSEN AND VACTOR OUT COLLECTED SEDIMENT, TRASH, AND DEBRIS.
3. CHECK TO MAKE SURE OVERFLOW PIPE BRACKET IS SECURE. TIGHTEN OR ADD SCREWS AS NEEDED.
4. REMOVE, CLEAN, AND REPLACE SCREEN AND SHIELD ON TOP OF OVERFLOW PIPE.
5. REMOVE AND DISPOSE OF SPENT HYDROCARBON PILLOW. PLACE NEW PILLOW (128 OZ MIN CAPACITY) PRIOR TO REPLACING GRATE.
6. REMOVE AND DISPOSE OF GEOTEXTILE FABRIC (AS APPLICABLE). WRAP NEW FABRIC OVER SLOTTED SCREEN AND SECURE IN PLACE.

DISPOSE OF WASTE IN ACCORDANCE WITH LOCAL LAWS AND REQUIREMENTS.

ALL MAINTENANCE ACTIVITIES, INSPECTION OBSERVATIONS, AND REPAIRS SHALL BE RECORDED IN THE MAINTENANCE LOG BOOK.

FOR MORE INFORMATION ABOUT MAINTENANCE, INSPECTION, AND REPAIRS, PLEASE CONTACT TORRENT RESOURCES.

TORRENT RESOURCES
9950 ALDER AVENUE
BLOOMINGTION, CA 92316
909-829-8740 | OFFICE

*REVISED 4/6/18*

# ATTACHMENTS FOR SECTION 3.2:

## 24-HOUR STORM CAPACITY

# 24-Hour Runoff Management Capacity Calculation

## Metro Orange Line Water Infiltration and Quality Project

As part of the Safe Clean Water Program Feasibility Study for the Metro Orange Line Water Infiltration and Quality Project ("Project"), this attachment documents the calculation of the 24-hour capacity.

Infiltration BMPs include system of drywells with pre-treatment facilities. Based on the conceptual design shown in the uploaded attachment in "Design Elements – Configuration" section of this application , each drywell was modelled as a storage basin that provides 322 cubic feet of storage. As discussed in the geotechnical PDF attachment uploaded in "Design- Elements - Site Condition" section of this application, a design infiltration rate of 0.8 cfs/drywell was calculated based on review of available boring log and Cone Penetration Test (CPT) data.

Based on the infiltration BMP configuration above, the 24-hour managed volume, which is a required input to the SCW Project Module, was computed as the sum of storage and infiltrated volume over 24-hours. The result is summarized in Table 1.

**Table 1. 24-Hour Managed Volume Calculation Summary**

| | |
|---|---|
| Storage Capacity | 322 ft$^3$ per drywell |
| Percolation Rates | 0.8 cfs/drywell |
| Number of Drywells | 168 |
| 24-Hour Storage Volume (ac-ft) | 1.2 |
| 24-Hour Infiltration Volume (ac-ft) | 267 |
| 24-Hour Managed Volume (ac-ft) | 268 |

# ATTACHMENTS FOR SECTION 3.3:

# EVENT-BASED DESIGN DETAILS

# Event-based Hydrologic Modeling

## Metro Orange Line Water Infiltration and Quality Project

# 1. INTRODUCTION

As part of the Safe Clean Water Program Feasibility Study for Metro Orange Line Water Infiltration and Quality Project ("Project"), this attachment documents the methodology and modeling results that support the quantified water quality and water supply benefits presented in the main report.

Given the nature of the proposed distributed infiltration BMPs, the Safe Clean Water project module's built-in modeling component cannot be utilized. Instead, the modeling work was performed using Los Angeles County's Watershed Management System 2.0 (WMMS 2.0). Detailed model development methodology is presented below.

# 2. MODEL DEVELOPMENT

WMMS 2.0 is the latest watershed modeling system that developed by Los Angeles Flood Control District. It is released to the public in May 2020. WMMS 2.0 is a thorough upgrade to WMMS 1.0 that was released in August 2013. In comparison to the previous version, WMMS 2.0 is calibrated based on hydrology and water quality monitoring data collected up to 2018 and hence can more accurately simulate contaminant loading, runoff volume, and flow rate associated with various design storms and long-term simulation for all major watershed within Los Angeles County. WMMS 2.0 contains two major components: a Loading Simulation Program in C++ (LSPC), which is a watershed modelling system to simulate runoff and pollutant loading; and a System for Urban Stormwater Treatment and Analysis Integration (SUSTAIN), which utilizes LSPC model output and evaluates BMP performance in terms of pollutant load reduction and runoff volume reduction

For the WMMS 2.0 model, the baseline LSPC model was modified by editing the subwatershed boundary and hydrologic response unit (HRU) parameters to simulate dry and wet weather runoff from the Project drainage areas[1]. The hydrologic response unit (HRU) within the revised subwaterhsed boundary was updated accordingly using the HRU raster downloaded from WMMS 2.0 website. A SUSTAIN model[2] was then developed to determine the design-storm and average annual stormwater capture volumes for a range of BMP configurations. This section describes the inputs used, the proposed sizing scenario and the results. It is assumed that the baseline LSPC model has been calibrated by LACFCD to reflect the hydrologic condition within each watershed in Los Angeles County. Default parameters were used unless site-specific modification was required (e.g. subwatershed boundary).

---

[1] Model input was developed and executed using LSPC v6.0 provided in the WMMS 2.0 application package

[2] Model input was developed and executed using SUSTAIN v2.1 provided in the WMM S 2.0 application package.

The remainder of the section focuses on describing the event-based simulation development of the WMMS 2.0 model.

## 3. ASSUMPTIONS AND APPROACH

The WMMS 2.0 input parameters assumed for each scenario included:

- **Precipitation and Model Run Time:** Taken directly from the baseline WMMS 2.0 database, the default rain gauges assigned to LSPC subwatersheds 6839, 6844, 6850, 6856, 6859 and 6861. For the 24-hour 85th percentile design storm simulation, the 4-day unit hydrographs were downloaded from the WMMS 2.0 data repository. In accordance with the WMMS 2.0 simulation guidance, use of a 4-day storm is conservative for runoff volume because soils in the simulation would be fully saturated by the fourth day and therefore can be used for assessing runoff volume reduction. The 4-day hyetographs are shown in Figure 1.

- **Dry-weather Runoff Estimate:** The LSPC model simulation estimated the dry weather runoff as a function of irrigated pervious HRU. This was updated for the updated Project drainage area described above.

- **Soils:** Taken directly from the baseline WMMS model, the default WMMS soil parameters adopted from LSPC subwatersheds 6839, 6844, 6850, 6856, 6859 and 6861were used in the simulation.

- **Routing:** Stormwater and dry weather runoff routing as illustrated in Figure 2 was set up in the SUSTAIN model to evaluate the proposed BMP configuration and dimensions. Consistent with the drywell cluster drainage areas shown in Figure 3, a total of seven 24-hour[3] design storm hydrograph outputs were included in the SUSTAIN model. During the simulation, bypass from any BMP cluster is considered overall bypass is not routed to any downstream BMP.

## 4. RESULTS

This section summarizes the modeling output. All model input and output files are provided in Appendix A.

Key inputs and results from the WMMS model are summarized in Table 1 for the 24-hour, 85th-percentile design storm event model. The results were aggregated from all the drainage area and organized in accordance with the input required specified in the SCW Project Module.

---

[3] While the total simulation time of the 24-hour 85th percentile design storm is four days, only the hydrograph from the last 24-hour was used for subsequent BMP routing analyses

**Table 1. Summary of Model Key Inputs and Results (24-Hour 85th-Percentile Design Storm)**

<table>
<tr><th colspan="7">Key Modeling Input</th></tr>
<tr><td colspan="6">Design Storm Rainfall Total (inches)</td><td>1.1[4]</td></tr>
<tr><td colspan="6">Total Number of Drywells Modeled</td><td>168</td></tr>
<tr><td colspan="6">Infiltration Capacity per Drywell (cfs)</td><td>0.8</td></tr>
<tr><th colspan="7">Key Modeling Output</th></tr>
<tr><th>Drywell Cluster</th><th>LSPC Subwatershed ID</th><th>Number of Drywells</th><th>Inflow Runoff Volume (ac-ft)</th><th>Capture Runoff Volume (ac-ft)</th><th>Bypass Runoff Volume (ac-ft)</th><th>Runoff Capture Percentage (%)</th></tr>
<tr><td>MOL-1</td><td>6861</td><td>24</td><td>18</td><td>17</td><td>1</td><td>94%</td></tr>
<tr><td>MOL-2</td><td>6856</td><td>40</td><td>44</td><td>38</td><td>6</td><td>86%</td></tr>
<tr><td>MOL-3</td><td>6850</td><td>14</td><td>15</td><td>13</td><td>2</td><td>87%</td></tr>
<tr><td>MOL-4</td><td>6844-1</td><td>39</td><td>37</td><td>33</td><td>4</td><td>89%</td></tr>
<tr><td>MOL-5</td><td>6844-2</td><td>13</td><td>9</td><td>9</td><td>0</td><td>100%</td></tr>
<tr><td>MOL-6</td><td>6665</td><td>10</td><td>4</td><td>4</td><td>0</td><td>100%</td></tr>
<tr><td>MOL-7</td><td>6839</td><td>28</td><td>14</td><td>14</td><td>0</td><td>100%</td></tr>
<tr><th>Total</th><td></td><th>168</th><th>141</th><th>128</th><th>14</th><th>91%</th></tr>
</table>

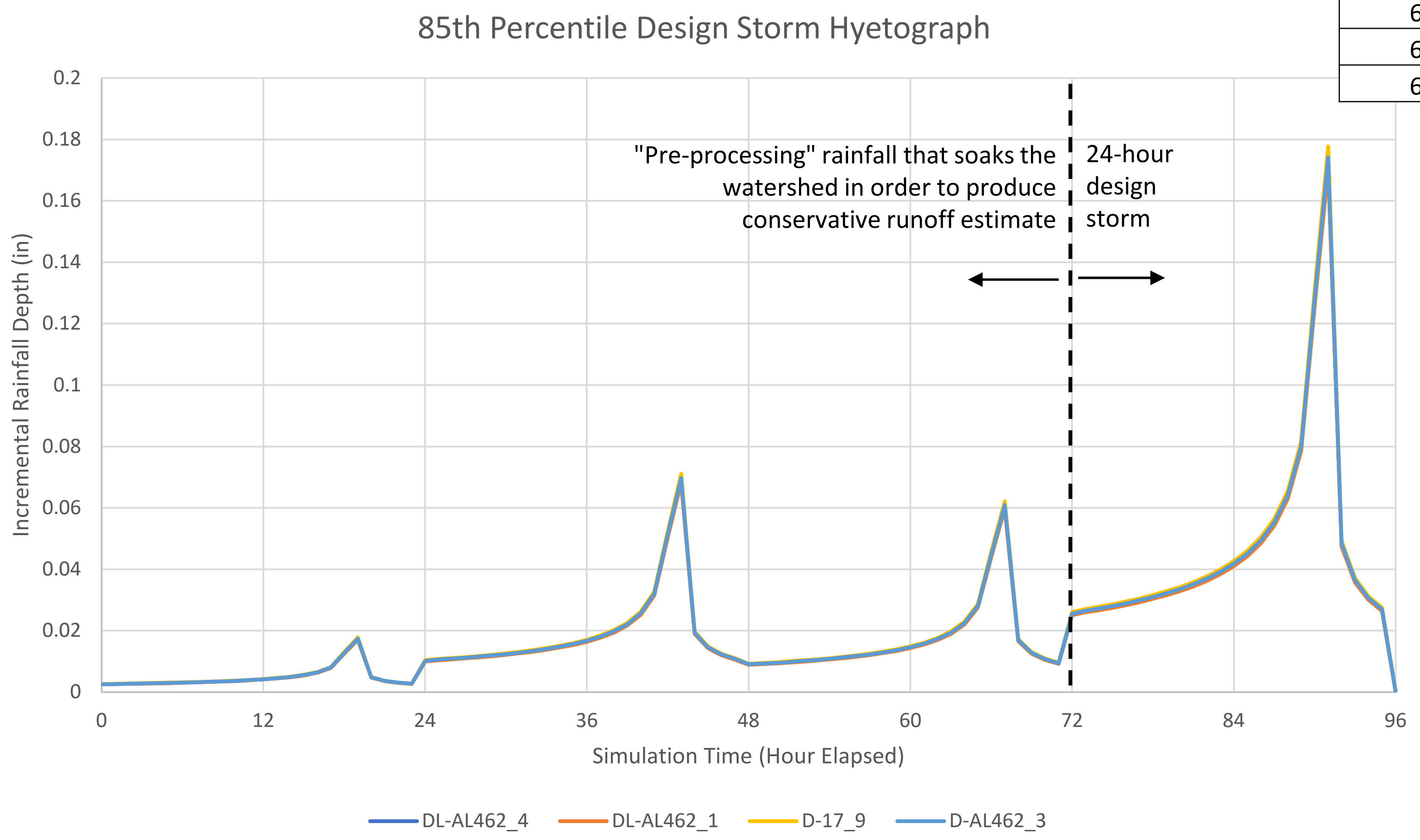
In summary, on an annual basis, based on the long-term simulation, the proposed Project is projected to capture 91% runoff from the 24-hour 85th percentile design storm.

---

[4] Average event-total depth of all rain gauges

# FIGURES

| LSPC Subwatershed ID | Rain Gauge ID |
|---|---|
| 6839 | D-AL462_4 |
| 6844 | D-AL462_4 |
| 6850 | D-AL462_3 |
| 6856 | D-AL462_1 |
| 6859 | D-17_9 |
| 6861 | D-AL462_1 |



**85th Percentile Design Storm Hyetograph**

**Metro Orange Line Water Infiltration and Quality Project – Event-based Hydrologic Modeling**
Los Angeles, CA

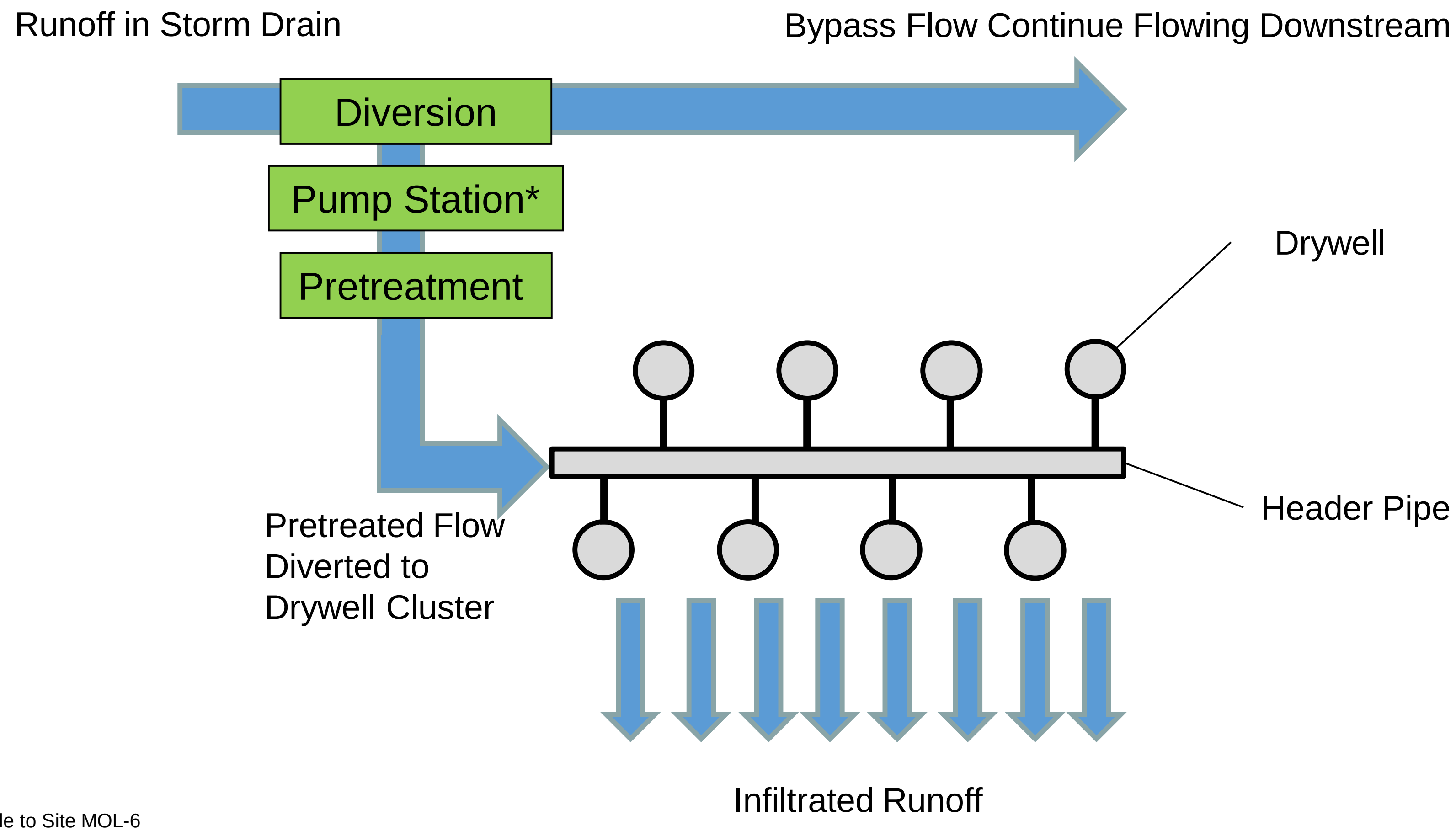
Geosyntec consultants

Los Angeles

October 2020

**Figure**

**1**



* Not applicable to Site MOL-6

**Simplified Routing Network**

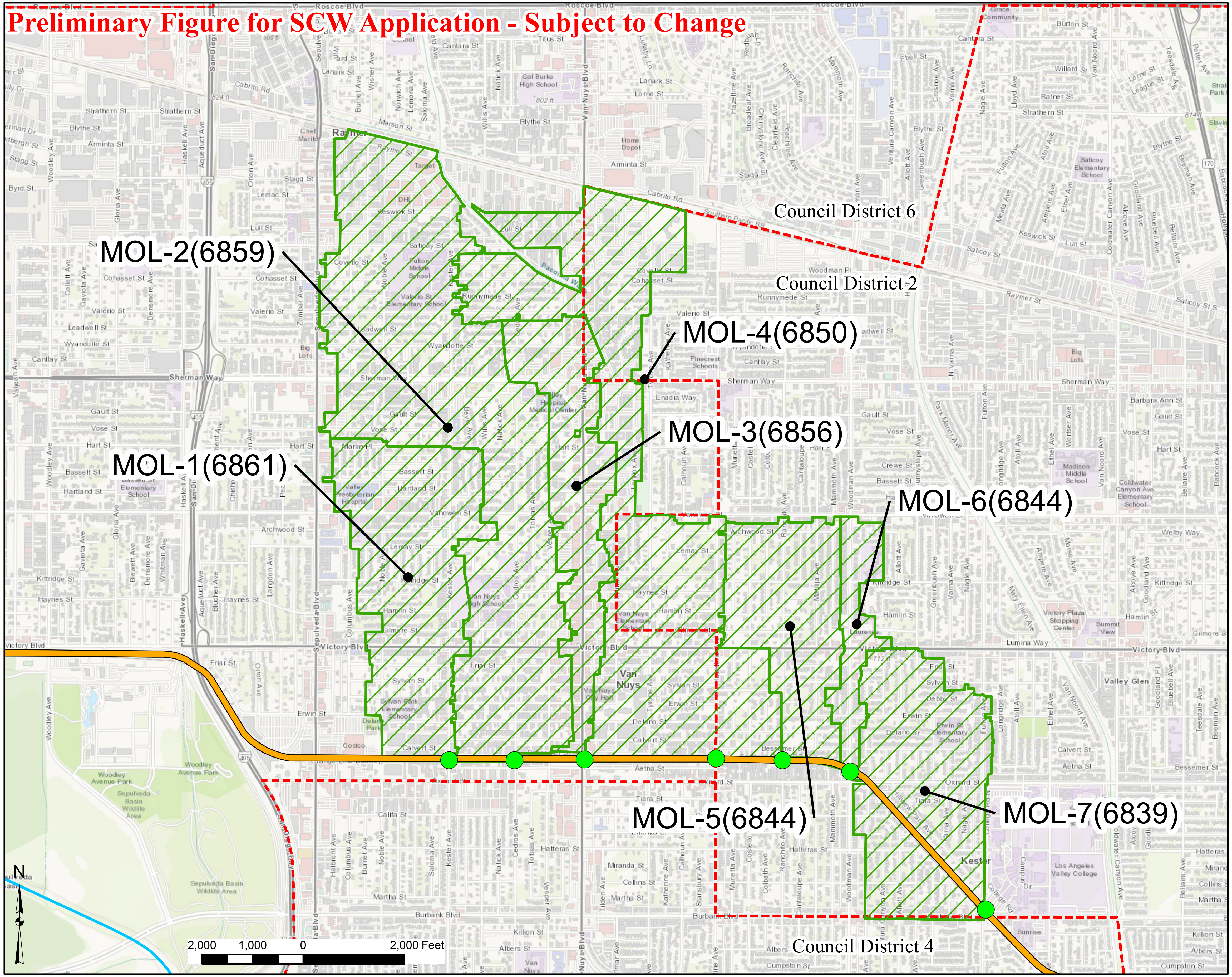
**Metro Orange Line Water Infiltration and Quality Project – Event-based Hydrologic Modeling**
Los Angeles, CA

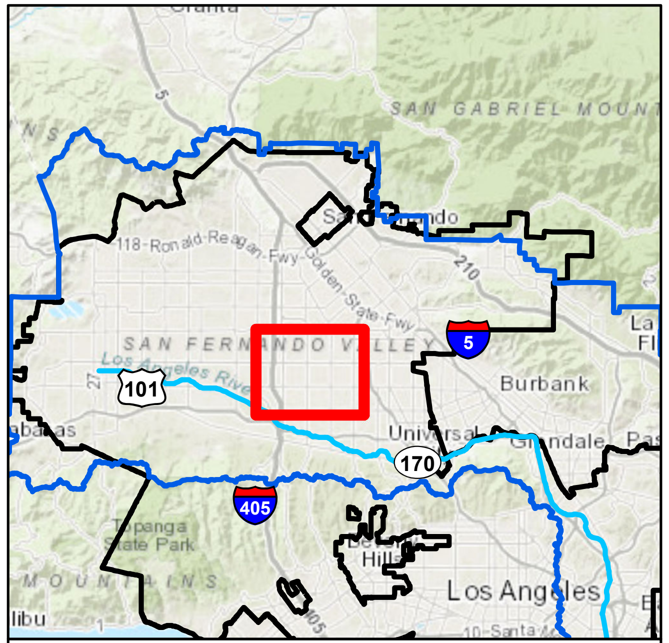
Geosyntec consultants

Los Angeles
October 2020

**Figure**

**2**





- 🟢 Proposed Drywell Clusters
- 🟧 Metro Orange Line
- Los Angeles River
- ▨ Drywell Cluster Drainage Area
- 🟦 Upper LA River Watershed (ULAR)
- ⬛ Los Angeles City Boundary
- 🟥 City Council District Boundary

1. LSPC Watershed IDs labeled.WMMS 2 Database (LA County Public Works), 2020

**Catchment Area with LSPC Subwatershed**

**Metro Orange Line Water Infiltration and Quality Project - Hydrology Report**

Los Angeles, CA

Geosyntec consultants

Los Angeles | October 2020

**Figure**

**3**

P:\GIS\Metro FS LA0583005\Project\H&H\Fig 03_Catchment.mxd

# APPENDIX A

## WMMS 2.0 LSPC and Sustain Model Input

*Output not included as it contains 10,000+ lines of times series output. Output can be provided as electronic copy upon request

# LSPC Model – 85th Percentile 24-hour Storm Runoff Generation

```
c-----------------------------------------------------------------------------------
c-----------------------------------------------------------------------------------
c LSPC -- Loading Simulation Program, C++
c Version 6.0 (64-bit) - Jan 2020
c
c Created through code updates by:
c Paradigm Environmental, Inc.
c San Diego, California, USA
c www.paradigmh2o.com
c
c Based upon LSPC version 5.0 (Mar 2018), originally developed by :
c United States Environmental Protection Agency
c with support by Tetra Tech, Inc.
c https://github.com/USEPA/LSPC-Loading-Simulation-Program
c
c NOTE: The line starting with the letter c and followed by space or - is a comment line.
c       There must be no comment line in between the data lines
c       The input text field must be a continuous string without any space in between the characters
c-----------------------------------------------------------------------------------
c LSPC MODEL INPUT FILE
c This input file was created at 00:13:57am on 09/11/2020
c-----------------------------------------------------------------------------------
c0   general control
c
c    snowfg   if = 1 run snow module
c    pwatfg   if = 1 run pwater
c    sedfg    if = 1 run sediment
c    pqalfg   if = 1 run general quality
c    tempfg   if = 1 run temperature module
c    oxfg     if = 1 run DO-BOD module
c    nutfg    if = 1 run nutrients module
c    plkfg    if = 1 run plank module
c    phfg     if = 1 run pH-CO2 module
c
c snowfg  pwatfg  sedfg  pqalfg  tempfg  oxfg  nutfg  plkfg  phfg
       0       1       1       1       0       0       0       0       0
c-----------------------------------------------------------------------------------
c10  weather file definition (name and parameters)
c
c    wfileid    weather file id
c    wfilename  weather file name
c    wparamnum  number of parameters in the weather file
c    wparamid   weather paramter id
c               1-precipitation (in/ivl)
c               2-potential evaporation (in/ivl)
c               3-air temperature (degree F)
c               4-wind speed (mile/ivl)
c               5-solar radiation (ly/ivl)
c               6-dew point (degree F)
c               7-cloud cover (tenth)
c
c wfileid   wfilename   wparamnum   wparamid...
       1792   D-AL462_4.pre  1       1
       1794   D-AL462_1.pre  1       1
       1795   D-AL464_2.pre  1       1
       1796   P-AL464_2.pre  1       1
       1797   P-AL462_1.pre  1       1
       1855   D-17_9.pre     1       1
       1857   D-AL462_3.pre  1       1
       2076   BLANK.air      1       2
c-----------------------------------------------------------------------------------
c15  weather station definition (station id and associated weather files)
c
c    wstationid  weather station id
c    wfilenum    number of files for the weather station
c    wfileid     weather file id (card 10)
c
c   wstationid   wfilenum   wfileid...
       792     2      1792    2076
       794     2      1794    2076
       795     2      1795    2076
       796     2      1796    2076
       797     2      1797    2076
       855     2      1855    2076
       857     2      1857    2076
```

```
c-----------------------------------------------------------------------------------------
c20  weather parameter multiplier
c
c    wstationid  weather station id (card 15)
c    wparmmult   multiplier for each weather parameter
c       1- multiplier for precipitation
c       2- multiplier for potential evapotranspiration
c       3- multiplier for air temperature
c       4- multiplier for wind speed
c       5- multiplier for solar radiation
c       6- multiplier for dew point
c       7- multiplier for cloud cover
c
c  wstationid  wparmmult1...
        792    1.000000       1.000000
        794    1.000000       1.000000
        795    1.000000       1.000000
        796    1.000000       1.000000
        797    1.000000       1.000000
        855    1.000000       1.000000
        857    1.000000       1.000000
c-----------------------------------------------------------------------------------------
c30 output file path     input (weather) file path  (each must be a continuous string)
        C:\WMMS2 LSPC Map\^LA0583005\Output\85P\     C:\WMMS2 LSPC Map\DataPackage\Weather_85P\
c-----------------------------------------------------------------------------------------
c40 general watershed controls
c
c    nsubbasin   number of subwatersheds
c    nrchid      number of stream channels (corresponds with number of subwatersheds)
c    nrgid       number of stream groups to assign parameters
c    ndefid      number of land groups to assign parameters
c    ndeluid     maximum number of land use
c
c nsws   nrch    nrgroup    nlgroup    nlandp
        12     12      2       2      96
c-----------------------------------------------------------------------------------------
c45  general output controls
c
c    Standard    Output standard model parameters
c    Snow        Output snow related parameters
c    Hydrology   Output hydrology related parameters
c    Sediment    Output sediment related parameters
c    GQUAL       Output general water quality related parameters
c    RQUAL       Output biochemical water quality related parameters
c    Custom      Output user specified parameters
c    Landuse     Output landuse summary
c                 if = 0 no output
c                 if = 1 average annual output
c                 if = 2 yearly output
c                 if = 3 monthly output
c    Stream      Output stream summary
c                 if = 0 no output
c                 if = 1 average annual output
c                 if = 2 yearly output
c                 if = 3 monthly output
c    PointSource Output point source summary
c                 if = 0 no output
c                 if = 1 average annual output
c                 if = 2 yearly output
c                 if = 3 monthly output
c    Threshold   Output threshold analysis summary
c                 if = 0 no output
c                 if = 1 average monthly output
c    SUSTAIN     Output unit-area land timeseries for SUSTAIN external option
c                 if = 0 no output
c                 if = 1 timeseries output
c
c Standard  Snow  Hydrology  Sediment  GQUAL  RQUAL  Custom  Landuse  Stream  PointSource  Threshold  SUSTAIN
        0      0       0      0       0      0       1      1       1      1       0      0
c-----------------------------------------------------------------------------------------
c46  user specified output parameter list
c
c   PRECP   AIRTMP  SNOTMP  SNOWF   RAINF   PRAIN   MELT   SNOWE  WYIELD  PACK    PACKF   PACKW   PACKI   PDEPTH
COVINDX   NEGHTS  XLNMELT     RDENPKF     SKYCLEAR    SNOCOV  DULLNESS    ALBEDO    PAKTEMP     DEWTMP  SURS
UZS     LZS     AGWS    SURO    IFWO  AGWO    PERO    TAET    PERC    INFIL   GWI     IGWI    AGWI      DEP
AVDEP   HRAD    AVVEL   SAREA   VOLUME   RO  TAU   WSSD   SCRSD   SOSED  SOBER   SSEDC  LSSED   LRSED  LBEDDEP
LDEPSCR     LROSED  SQO     WASHQS  SCRQS   SOQO    POQUAL  SOQUAL  IOQUAL    GOQUAL  POQC  CONC  CONCOUT
CONCSQAL   MATSQAL  MATIN   MATOUT   MATOSQAL  DOX   DOXMIN  DOXMAX   DOXAV   DOXX   BOD   BODX  NO3   NO3X
```

```
TAM    TAMX    NO2    NO2X    PO4    PO4X   SNH4   SNH4X   SPO4   SPO4X    PHYTO   PHYTOX   PHYCLA   BENAL   ORN
ORNX    ORP     ORPX   ORC   ORCX   NOX   DIN   TN   TP   PH   ALK   TIC   TICX   CO2   CO2X   TEMP
       1      0      0      0      0      0      0      0      0      0      0      0      0      0
       0      0      0      0      0      0      0      0      0      0      0      0      0      0
       1      0      0      0      0      0      0      0      0      0      0      0      0      0
       0      0      0      0      0      0      0      0      0      0      0      0      0      0
       0      0      0      0      0      0      0      0      0      0      0      0      0      0
       0      0      0      0      0      0      0      0      0      0      0      0      0      0
       0      0      0      0      0      0      0      0      0      0      0      0      0      0
       0      0      0      0      0      0      0      0      0      0      0      0      0      0
c-----------------------------------------------------------------------------------------
c50  model simulation time period
c
c    mstart   model start day.
c    mend     model end day.
c    deltm    time step in minutes.
c    mostart  model output start day.
c    moend    model output end day.
c    optlevel  if = 1 general output (daily)
c              if = 2 output per hour (hourly)
c              if = 3 output per time interval (minute)
c
c mstart   mend    deltm mostart    moend   optlevel
       1/1/2010       1/6/2010       60      1/1/2010       1/6/2010       3
c-----------------------------------------------------------------------------------------
c60  group information
c
c    subbasin  subbasin id
c    defid     group parameter id
c    nwst      number of weather stations assigned to the watershed
c    wsti = station id
c    wti = weighting to calculate input
c
c subbasin   defid   nwst  wst1   wt1   wst2   wt2   ...
       6665   40     1      792    1.000000
       6671   33     1      794    1.000000
       6673   33     1      857    1.000000
       6674   33     1      795    1.000000
       6675   33     1      795    1.000000
       6684   40     1      797    1.000000
       6839   33     1      792    1.000000
       6844   40     1      792    1.000000
       6850   33     1      857    1.000000
       6856   40     1      794    1.000000
       6859   33     1      855    1.000000
       6861   40     1      794    1.000000
c-----------------------------------------------------------------------------------------
c70  modeled land use names
c
c    deluid     landuse id
c    deluname   landuse name
c    premult    multiplier for precipitation
c    petmult    multiplier for potential evapotranspiration
c
c deluid  deluname  premult  petmult
       1000   Road_Freeway-All-All-All      1.000000       0.300000
       2000   Road_Primary-All-All-All      1.000000       0.300000
       3000   Road_Minor-All-All-All 1.000000       0.300000
       4000   Dev_ResHigh-All-All-All       1.000000       0.300000
       5000   Dev_ResLow-All-All-All 1.000000       0.300000
       6000   Dev_Com-All-All-All    1.000000       0.300000
       7000   Dev_Ind-All-All-All    1.000000       0.300000
       8000   Dev_Inst-All-All-All   1.000000       0.300000
       9000   Dev_Roof-All-All-All   1.000000       0.300000
       10000  Dev_Overspray-All-All-All     1.000000       0.300000
       11111  Dev_Irrigated-A-Low-Confined  1.000000       0.500000
       11112  Dev_Irrigated-A-Low-Unconfined       1.000000       0.500000
       11121  Dev_Irrigated-A-Med-Confined  1.000000       0.500000
       11122  Dev_Irrigated-A-Med-Unconfined       1.000000       0.500000
       11211  Dev_Irrigated-B-Low-Confined  1.000000       0.500000
       11212  Dev_Irrigated-B-Low-Unconfined       1.000000       0.500000
       11221  Dev_Irrigated-B-Med-Confined  1.000000       0.500000
       11222  Dev_Irrigated-B-Med-Unconfined       1.000000       0.500000
       11311  Dev_Irrigated-C-Low-Confined  1.000000       0.500000
       11312  Dev_Irrigated-C-Low-Unconfined       1.000000       0.500000
       11321  Dev_Irrigated-C-Med-Confined  1.000000       0.500000
       11322  Dev_Irrigated-C-Med-Unconfined       1.000000       0.500000
       11411  Dev_Irrigated-D-Low-Confined  1.000000       0.500000
       11412  Dev_Irrigated-D-Low-Unconfined       1.000000       0.500000
```

```
       11421  Dev_Irrigated-D-Med-Confined  1.000000       0.500000
       11422  Dev_Irrigated-D-Med-Unconfined       1.000000       0.500000
       12111  Dev_Pervious-A-Low-Confined   1.000000       0.500000
       12112  Dev_Pervious-A-Low-Unconfined 1.000000       0.500000
       12121  Dev_Pervious-A-Med-Confined   1.000000       0.500000
       12122  Dev_Pervious-A-Med-Unconfined 1.000000       0.500000
       12211  Dev_Pervious-B-Low-Confined   1.000000       0.500000
       12212  Dev_Pervious-B-Low-Unconfined 1.000000       0.500000
       12221  Dev_Pervious-B-Med-Confined   1.000000       0.500000
       12222  Dev_Pervious-B-Med-Unconfined 1.000000       0.500000
       12311  Dev_Pervious-C-Low-Confined   1.000000       0.500000
       12312  Dev_Pervious-C-Low-Unconfined 1.000000       0.500000
       12321  Dev_Pervious-C-Med-Confined   1.000000       0.500000
       12322  Dev_Pervious-C-Med-Unconfined 1.000000       0.500000
       12411  Dev_Pervious-D-Low-Confined   1.000000       0.500000
       12412  Dev_Pervious-D-Low-Unconfined 1.000000       0.500000
       12421  Dev_Pervious-D-Med-Confined   1.000000       0.500000
       12422  Dev_Pervious-D-Med-Unconfined 1.000000       0.500000
       13111  Agriculture-A-Low-Confined    1.000000       1.000000
       13112  Agriculture-A-Low-Unconfined  1.000000       1.000000
       13121  Agriculture-A-Med-Confined    1.000000       1.000000
       13122  Agriculture-A-Med-Unconfined  1.000000       1.000000
       13211  Agriculture-B-Low-Confined    1.000000       1.000000
       13212  Agriculture-B-Low-Unconfined  1.000000       1.000000
       13221  Agriculture-B-Med-Confined    1.000000       1.000000
       13222  Agriculture-B-Med-Unconfined  1.000000       1.000000
       13231  Agriculture-B-High-Confined   1.000000       1.000000
       13232  Agriculture-B-High-Unconfined 1.000000       1.000000
       13311  Agriculture-C-Low-Confined    1.000000       1.000000
       13312  Agriculture-C-Low-Unconfined  1.000000       1.000000
       13321  Agriculture-C-Med-Confined    1.000000       1.000000
       13322  Agriculture-C-Med-Unconfined  1.000000       1.000000
       13331  Agriculture-C-High-Confined   1.000000       1.000000
       13411  Agriculture-D-Low-Confined    1.000000       1.000000
       13412  Agriculture-D-Low-Unconfined  1.000000       1.000000
       13421  Agriculture-D-Med-Confined    1.000000       1.000000
       13422  Agriculture-D-Med-Unconfined  1.000000       1.000000
       13431  Agriculture-D-High-Confined   1.000000       1.000000
       13432  Agriculture-D-High-Unconfined 1.000000       1.000000
       14121  Veg_Low-A-Med-Confined 1.000000       1.000000
       14122  Veg_Low-A-Med-Unconfined      1.000000       1.000000
       14131  Veg_Low-A-High-Confined       1.000000       1.000000
       14132  Veg_Low-A-High-Unconfined     1.000000       1.000000
       14221  Veg_Low-B-Med-Confined 1.000000       1.000000
       14222  Veg_Low-B-Med-Unconfined      1.000000       1.000000
       14231  Veg_Low-B-High-Confined       1.000000       1.000000
       14232  Veg_Low-B-High-Unconfined     1.000000       1.000000
       14321  Veg_Low-C-Med-Confined 1.000000       1.000000
       14322  Veg_Low-C-Med-Unconfined      1.000000       1.000000
       14331  Veg_Low-C-High-Confined       1.000000       1.000000
       14332  Veg_Low-C-High-Unconfined     1.000000       1.000000
       14421  Veg_Low-D-Med-Confined 1.000000       1.000000
       14422  Veg_Low-D-Med-Unconfined      1.000000       1.000000
       14431  Veg_Low-D-High-Confined       1.000000       1.000000
       14432  Veg_Low-D-High-Unconfined     1.000000       1.000000
       15121  Veg_High-A-Med-Confined       1.000000       1.000000
       15122  Veg_High-A-Med-Unconfined     1.000000       1.000000
       15131  Veg_High-A-High-Confined      1.000000       1.000000
       15132  Veg_High-A-High-Unconfined    1.000000       1.000000
       15221  Veg_High-B-Med-Confined       1.000000       1.000000
       15222  Veg_High-B-Med-Unconfined     1.000000       1.000000
       15231  Veg_High-B-High-Confined      1.000000       1.000000
       15232  Veg_High-B-High-Unconfined    1.000000       1.000000
       15321  Veg_High-C-Med-Confined       1.000000       1.000000
       15322  Veg_High-C-Med-Unconfined     1.000000       1.000000
       15331  Veg_High-C-High-Confined      1.000000       1.000000
       15332  Veg_High-C-High-Unconfined    1.000000       1.000000
       15421  Veg_High-D-Med-Confined       1.000000       1.000000
       15422  Veg_High-D-Med-Unconfined     1.000000       1.000000
       15431  Veg_High-D-High-Confined      1.000000       1.000000
       15432  Veg_High-D-High-Unconfined    1.000000       1.000000
       16000  Water-All-All-All      1.000000       1.000000
c------------------------------------------------------------------------------------------
c80  land use to stream routing
c
c    defid       landuse default group id
c    deluid      land use id
c    route_suro  fraction of surface runoff that routes to the stream (0-1) (default=1)
c                if negative (<0) value then that fraction will be lost from the system
```

```
c    route_ifwo  fraction of interflow outflow that routes to the stream (0-1) (default=1)
c                if negative (<0) value then that fraction will be lost from the system
c    route_agwo  fraction of groundwater outflow that routes to the stream (0-1) (default=1)
c                if negative (<0) value then that fraction will be lost from the system
c
c    Example: 0.3 means 30% of outflow routes to the stream and 70% bypasses to the next down stream in the
reach network
c            -0.3 means 30% of outflow is permanently lost from the system and 70% routes to the stream
c             Enter a value of -1 to permanently lose all water from the respective layer
c             This convention applies to all three parameters (route_suro, route_ifwo, and route_agwo)
c
c  defid  deluid  route_suro  route_ifwo  route_agwo
        33     1000    1.000000       1.000000       -1.000000
        33     2000    1.000000       1.000000       -1.000000
        33     3000    1.000000       1.000000       -1.000000
        33     4000    1.000000       1.000000       -1.000000
        33     5000    1.000000       1.000000       -1.000000
        33     6000    1.000000       1.000000       -1.000000
        33     7000    1.000000       1.000000       -1.000000
        33     8000    1.000000       1.000000       -1.000000
        33     9000    1.000000       1.000000       -1.000000
        33     10000   1.000000       1.000000       -1.000000
        33     11111   1.000000       1.000000       -0.900000
        33     11112   1.000000       1.000000       -0.900000
        33     11121   1.000000       1.000000       -0.900000
        33     11122   1.000000       1.000000       -0.900000
        33     11211   1.000000       1.000000       -0.900000
        33     11212   1.000000       1.000000       -0.900000
        33     11221   1.000000       1.000000       -0.900000
        33     11222   1.000000       1.000000       -0.900000
        33     11311   1.000000       1.000000       -0.900000
        33     11312   1.000000       1.000000       -0.900000
        33     11321   1.000000       1.000000       -0.900000
        33     11322   1.000000       1.000000       -0.900000
        33     11411   1.000000       1.000000       -0.900000
        33     11412   1.000000       1.000000       -0.900000
        33     11421   1.000000       1.000000       -0.900000
        33     11422   1.000000       1.000000       -0.900000
        33     12111   1.000000       1.000000       -0.900000
        33     12112   1.000000       1.000000       -0.900000
        33     12121   1.000000       1.000000       -0.900000
        33     12122   1.000000       1.000000       -0.900000
        33     12211   1.000000       1.000000       -0.900000
        33     12212   1.000000       1.000000       -0.900000
        33     12221   1.000000       1.000000       -0.900000
        33     12222   1.000000       1.000000       -0.900000
        33     12311   1.000000       1.000000       -0.900000
        33     12312   1.000000       1.000000       -0.900000
        33     12321   1.000000       1.000000       -0.900000
        33     12322   1.000000       1.000000       -0.900000
        33     12411   1.000000       1.000000       -0.900000
        33     12412   1.000000       1.000000       -0.900000
        33     12421   1.000000       1.000000       -0.900000
        33     12422   1.000000       1.000000       -0.900000
        33     13111   1.000000       1.000000       -0.500000
        33     13112   1.000000       1.000000       -0.500000
        33     13121   1.000000       1.000000       -0.500000
        33     13122   1.000000       1.000000       -0.500000
        33     13211   1.000000       1.000000       -0.500000
        33     13212   1.000000       1.000000       -0.500000
        33     13221   1.000000       1.000000       -0.500000
        33     13222   1.000000       1.000000       -0.500000
        33     13231   1.000000       1.000000       -0.500000
        33     13232   1.000000       1.000000       -0.500000
        33     13311   1.000000       1.000000       -0.500000
        33     13312   1.000000       1.000000       -0.500000
        33     13321   1.000000       1.000000       -0.500000
        33     13322   1.000000       1.000000       -0.500000
        33     13331   1.000000       1.000000       -0.500000
        33     13411   1.000000       1.000000       -0.500000
        33     13412   1.000000       1.000000       -0.500000
        33     13421   1.000000       1.000000       -0.500000
        33     13422   1.000000       1.000000       -0.500000
        33     13431   1.000000       1.000000       -0.500000
        33     13432   1.000000       1.000000       -0.500000
        33     14121   1.000000       1.000000       -0.500000
        33     14122   1.000000       1.000000       -0.500000
        33     14131   1.000000       1.000000       -0.500000
        33     14132   1.000000       1.000000       -0.500000
```

```
33      14221  1.000000       1.000000       -0.500000
33      14222  1.000000       1.000000       -0.500000
33      14231  1.000000       1.000000       -0.500000
33      14232  1.000000       1.000000       -0.500000
33      14321  1.000000       1.000000       -0.500000
33      14322  1.000000       1.000000       -0.500000
33      14331  1.000000       1.000000       -0.500000
33      14332  1.000000       1.000000       -0.500000
33      14421  1.000000       1.000000       -0.500000
33      14422  1.000000       1.000000       -0.500000
33      14431  1.000000       1.000000       -0.500000
33      14432  1.000000       1.000000       -0.500000
33      15121  1.000000       1.000000       -0.500000
33      15122  1.000000       1.000000       -0.500000
33      15131  1.000000       1.000000       -0.500000
33      15132  1.000000       1.000000       -0.500000
33      15221  1.000000       1.000000       -0.500000
33      15222  1.000000       1.000000       -0.500000
33      15231  1.000000       1.000000       -0.500000
33      15232  1.000000       1.000000       -0.500000
33      15321  1.000000       1.000000       -0.500000
33      15322  1.000000       1.000000       -0.500000
33      15331  1.000000       1.000000       -0.500000
33      15332  1.000000       1.000000       -0.500000
33      15421  1.000000       1.000000       -0.500000
33      15422  1.000000       1.000000       -0.500000
33      15431  1.000000       1.000000       -0.500000
33      15432  1.000000       1.000000       -0.500000
33      16000  1.000000       1.000000       -0.500000
40      1000   -0.400000      -0.900000      -1.000000
40      2000   -0.400000      -0.900000      -1.000000
40      3000   -0.400000      -0.900000      -1.000000
40      4000   -0.400000      -0.900000      -1.000000
40      5000   -0.400000      -0.900000      -1.000000
40      6000   -0.400000      -0.900000      -1.000000
40      7000   -0.400000      -0.900000      -1.000000
40      8000   -0.400000      -0.900000      -1.000000
40      9000   -0.400000      -0.900000      -1.000000
40      10000  -0.400000      -0.900000      -1.000000
40      11111  -0.400000      -0.900000      -0.900000
40      11112  -0.400000      -0.900000      -0.900000
40      11121  -0.400000      -0.900000      -0.900000
40      11122  -0.400000      -0.900000      -0.900000
40      11211  -0.400000      -0.900000      -0.900000
40      11212  -0.400000      -0.900000      -0.900000
40      11221  -0.400000      -0.900000      -0.900000
40      11222  -0.400000      -0.900000      -0.900000
40      11311  -0.400000      -0.900000      -0.900000
40      11312  -0.400000      -0.900000      -0.900000
40      11321  -0.400000      -0.900000      -0.900000
40      11322  -0.400000      -0.900000      -0.900000
40      11411  -0.400000      -0.900000      -0.900000
40      11412  -0.400000      -0.900000      -0.900000
40      11421  -0.400000      -0.900000      -0.900000
40      11422  -0.400000      -0.900000      -0.900000
40      12111  -0.400000      -0.900000      -0.900000
40      12112  -0.400000      -0.900000      -0.900000
40      12121  -0.400000      -0.900000      -0.900000
40      12122  -0.400000      -0.900000      -0.900000
40      12211  -0.400000      -0.900000      -0.900000
40      12212  -0.400000      -0.900000      -0.900000
40      12221  -0.400000      -0.900000      -0.900000
40      12222  -0.400000      -0.900000      -0.900000
40      12311  -0.400000      -0.900000      -0.900000
40      12312  -0.400000      -0.900000      -0.900000
40      12321  -0.400000      -0.900000      -0.900000
40      12322  -0.400000      -0.900000      -0.900000
40      12411  -0.400000      -0.900000      -0.900000
40      12412  -0.400000      -0.900000      -0.900000
40      12421  -0.400000      -0.900000      -0.900000
40      12422  -0.400000      -0.900000      -0.900000
40      13111  -0.400000      -0.500000      -0.800000
40      13112  -0.400000      -0.500000      -0.800000
40      13121  -0.400000      -0.500000      -0.800000
40      13122  -0.400000      -0.500000      -0.800000
40      13211  -0.400000      -0.500000      -0.800000
40      13212  -0.400000      -0.500000      -0.800000
40      13221  -0.400000      -0.500000      -0.800000
40      13222  -0.400000      -0.500000      -0.800000
```

```
       40     13231  -0.400000      -0.500000      -0.800000
       40     13232  -0.400000      -0.500000      -0.800000
       40     13311  -0.400000      -0.500000      -0.800000
       40     13312  -0.400000      -0.500000      -0.800000
       40     13321  -0.400000      -0.500000      -0.800000
       40     13322  -0.400000      -0.500000      -0.800000
       40     13331  -0.400000      -0.500000      -0.800000
       40     13411  -0.400000      -0.500000      -0.800000
       40     13412  -0.400000      -0.500000      -0.800000
       40     13421  -0.400000      -0.500000      -0.800000
       40     13422  -0.400000      -0.500000      -0.800000
       40     13431  -0.400000      -0.500000      -0.800000
       40     13432  -0.400000      -0.500000      -0.800000
       40     14121  -0.400000      -0.500000      -0.800000
       40     14122  -0.400000      -0.500000      -0.800000
       40     14131  -0.400000      -0.500000      -0.800000
       40     14132  -0.400000      -0.500000      -0.800000
       40     14221  -0.400000      -0.500000      -0.800000
       40     14222  -0.400000      -0.500000      -0.800000
       40     14231  -0.400000      -0.500000      -0.800000
       40     14232  -0.400000      -0.500000      -0.800000
       40     14321  -0.400000      -0.500000      -0.800000
       40     14322  -0.400000      -0.500000      -0.800000
       40     14331  -0.400000      -0.500000      -0.800000
       40     14332  -0.400000      -0.500000      -0.800000
       40     14421  -0.400000      -0.500000      -0.800000
       40     14422  -0.400000      -0.500000      -0.800000
       40     14431  -0.400000      -0.500000      -0.800000
       40     14432  -0.400000      -0.500000      -0.800000
       40     15121  -0.400000      -0.500000      -0.800000
       40     15122  -0.400000      -0.500000      -0.800000
       40     15131  -0.400000      -0.500000      -0.800000
       40     15132  -0.400000      -0.500000      -0.800000
       40     15221  -0.400000      -0.500000      -0.800000
       40     15222  -0.400000      -0.500000      -0.800000
       40     15231  -0.400000      -0.500000      -0.800000
       40     15232  -0.400000      -0.500000      -0.800000
       40     15321  -0.400000      -0.500000      -0.800000
       40     15322  -0.400000      -0.500000      -0.800000
       40     15331  -0.400000      -0.500000      -0.800000
       40     15332  -0.400000      -0.500000      -0.800000
       40     15421  -0.400000      -0.500000      -0.800000
       40     15422  -0.400000      -0.500000      -0.800000
       40     15431  -0.400000      -0.500000      -0.800000
       40     15432  -0.400000      -0.500000      -0.800000
       40     16000  -0.400000      -0.500000      -0.800000
c------------------------------------------------------------------------------------------
c90  land use information
c
c    subbasin   subbasin id
c    deluid     land use id
c    deluname   land use name
c    perimp     1 imperivous land (subsurface processes disabled)
c               2 pervious  land (subsurface processes activated)
c    area_ac    area (acres)
c    slsur      slope of overland flow plane (none)
c    lsur       length of overland flow plane (feet)
c
c  subbasin  deluid  deluname  perimp  area_ac  slsur  lsur
       6665   1000   Road_Freeway-All-All-All      1      0.000000       0.010000       100.000000
       6665   2000   Road_Primary-All-All-All      1      8.985516       0.010000       100.000000
       6665   3000   Road_Minor-All-All-All 1      2.325384       0.010000       100.000000
       6665   4000   Dev_ResHigh-All-All-All       1      3.402785       0.010000       100.000000
       6665   5000   Dev_ResLow-All-All-All 1      1.636626       0.010000       100.000000
       6665   6000   Dev_Com-All-All-All    1      4.142739       0.010000       100.000000
       6665   7000   Dev_Ind-All-All-All    1      0.000000       0.010000       100.000000
       6665   8000   Dev_Inst-All-All-All   1      3.182982       0.010000       100.000000
       6665   9000   Dev_Roof-All-All-All   1      21.112313      0.010000       100.000000
       6665   10000  Dev_Overspray-All-All-All     1      0.347450       0.010000       100.000000
       6665   11111  Dev_Irrigated-A-Low-Confined  2      0.000000       0.010000       400.000000
       6665   11112  Dev_Irrigated-A-Low-Unconfined       2      0.000000       0.010000       400.000000
       6665   11121  Dev_Irrigated-A-Med-Confined  2      0.000000       0.010000       300.000000
       6665   11122  Dev_Irrigated-A-Med-Unconfined       2      0.000000       0.010000       300.000000
       6665   11211  Dev_Irrigated-B-Low-Confined  2      0.000000       0.010000       400.000000
       6665   11212  Dev_Irrigated-B-Low-Unconfined       2      0.000000       0.010000       400.000000
       6665   11221  Dev_Irrigated-B-Med-Confined  2      0.000000       0.010000       300.000000
       6665   11222  Dev_Irrigated-B-Med-Unconfined       2      0.000000       0.010000       300.000000
       6665   11311  Dev_Irrigated-C-Low-Confined  2      0.000000       0.010000       400.000000
       6665   11312  Dev_Irrigated-C-Low-Unconfined       2      0.000000       0.010000       400.000000
```

| | | | | | | |
|---|---|---|---|---|---|---|
| 6665 | 11321 | Dev_Irrigated-C-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6665 | 11322 | Dev_Irrigated-C-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6665 | 11411 | Dev_Irrigated-D-Low-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6665 | 11412 | Dev_Irrigated-D-Low-Unconfined | 2 | 1.510911 | 0.010000 | 400.000000 |
| 6665 | 11421 | Dev_Irrigated-D-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6665 | 11422 | Dev_Irrigated-D-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6665 | 12111 | Dev_Pervious-A-Low-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6665 | 12112 | Dev_Pervious-A-Low-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6665 | 12121 | Dev_Pervious-A-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6665 | 12122 | Dev_Pervious-A-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6665 | 12211 | Dev_Pervious-B-Low-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6665 | 12212 | Dev_Pervious-B-Low-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6665 | 12221 | Dev_Pervious-B-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6665 | 12222 | Dev_Pervious-B-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6665 | 12311 | Dev_Pervious-C-Low-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6665 | 12312 | Dev_Pervious-C-Low-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6665 | 12321 | Dev_Pervious-C-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6665 | 12322 | Dev_Pervious-C-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6665 | 12411 | Dev_Pervious-D-Low-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6665 | 12412 | Dev_Pervious-D-Low-Unconfined | 2 | 4.317925 | 0.010000 | 400.000000 |
| 6665 | 12421 | Dev_Pervious-D-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6665 | 12422 | Dev_Pervious-D-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6665 | 13111 | Agriculture-A-Low-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6665 | 13112 | Agriculture-A-Low-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6665 | 13121 | Agriculture-A-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6665 | 13122 | Agriculture-A-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6665 | 13211 | Agriculture-B-Low-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6665 | 13212 | Agriculture-B-Low-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6665 | 13221 | Agriculture-B-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6665 | 13222 | Agriculture-B-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6665 | 13231 | Agriculture-B-High-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6665 | 13232 | Agriculture-B-High-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6665 | 13311 | Agriculture-C-Low-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6665 | 13312 | Agriculture-C-Low-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6665 | 13321 | Agriculture-C-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6665 | 13322 | Agriculture-C-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6665 | 13331 | Agriculture-C-High-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6665 | 13411 | Agriculture-D-Low-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6665 | 13412 | Agriculture-D-Low-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6665 | 13421 | Agriculture-D-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6665 | 13422 | Agriculture-D-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6665 | 13431 | Agriculture-D-High-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6665 | 13432 | Agriculture-D-High-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6665 | 14121 | Veg_Low-A-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6665 | 14122 | Veg_Low-A-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6665 | 14131 | Veg_Low-A-High-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6665 | 14132 | Veg_Low-A-High-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6665 | 14221 | Veg_Low-B-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6665 | 14222 | Veg_Low-B-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6665 | 14231 | Veg_Low-B-High-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6665 | 14232 | Veg_Low-B-High-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6665 | 14321 | Veg_Low-C-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6665 | 14322 | Veg_Low-C-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6665 | 14331 | Veg_Low-C-High-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6665 | 14332 | Veg_Low-C-High-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6665 | 14421 | Veg_Low-D-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6665 | 14422 | Veg_Low-D-Med-Unconfined | 2 | 3.304589 | 0.010000 | 300.000000 |
| 6665 | 14431 | Veg_Low-D-High-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6665 | 14432 | Veg_Low-D-High-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6665 | 15121 | Veg_High-A-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6665 | 15122 | Veg_High-A-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6665 | 15131 | Veg_High-A-High-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6665 | 15132 | Veg_High-A-High-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6665 | 15221 | Veg_High-B-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6665 | 15222 | Veg_High-B-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6665 | 15231 | Veg_High-B-High-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6665 | 15232 | Veg_High-B-High-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6665 | 15321 | Veg_High-C-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6665 | 15322 | Veg_High-C-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6665 | 15331 | Veg_High-C-High-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6665 | 15332 | Veg_High-C-High-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6665 | 15421 | Veg_High-D-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6665 | 15422 | Veg_High-D-Med-Unconfined | 2 | 12.946617 | 0.010000 | 300.000000 |
| 6665 | 15431 | Veg_High-D-High-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6665 | 15432 | Veg_High-D-High-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6665 | 16000 | Water-All-All-All | 1 | 0.000000 | 0.010000 | 100.000000 |
| 6671 | 1000 | Road_Freeway-All-All-All | 1 | 0.000000 | 0.010000 | 100.000000 |
| 6671 | 2000 | Road_Primary-All-All-All | 1 | 2.312761 | 0.010000 | 100.000000 |
| 6671 | 3000 | Road_Minor-All-All-All | 1 | 0.904067 | 0.010000 | 100.000000 |

```
6671	4000	Dev_ResHigh-All-All-All	1	1.247810	0.010000	100.000000
6671	5000	Dev_ResLow-All-All-All	1	5.720340	0.010000	100.000000
6671	6000	Dev_Com-All-All-All	1	1.113389	0.010000	100.000000
6671	7000	Dev_Ind-All-All-All	1	0.000163	0.010000	100.000000
6671	8000	Dev_Inst-All-All-All	1	0.736398	0.010000	100.000000
6671	9000	Dev_Roof-All-All-All	1	11.268195	0.010000	100.000000
6671	10000	Dev_Overspray-All-All-All	1	0.320635	0.010000	100.000000
6671	11111	Dev_Irrigated-A-Low-Confined	2	0.000000	0.010000	400.000000
6671	11112	Dev_Irrigated-A-Low-Unconfined	2	0.000000	0.010000	400.000000
6671	11121	Dev_Irrigated-A-Med-Confined	2	0.000000	0.010000	300.000000
6671	11122	Dev_Irrigated-A-Med-Unconfined	2	0.000000	0.010000	300.000000
6671	11211	Dev_Irrigated-B-Low-Confined	2	0.000000	0.010000	400.000000
6671	11212	Dev_Irrigated-B-Low-Unconfined	2	0.000000	0.010000	400.000000
6671	11221	Dev_Irrigated-B-Med-Confined	2	0.000000	0.010000	300.000000
6671	11222	Dev_Irrigated-B-Med-Unconfined	2	0.000000	0.010000	300.000000
6671	11311	Dev_Irrigated-C-Low-Confined	2	0.000000	0.010000	400.000000
6671	11312	Dev_Irrigated-C-Low-Unconfined	2	0.000000	0.010000	400.000000
6671	11321	Dev_Irrigated-C-Med-Confined	2	0.000000	0.010000	300.000000
6671	11322	Dev_Irrigated-C-Med-Unconfined	2	0.000000	0.010000	300.000000
6671	11411	Dev_Irrigated-D-Low-Confined	2	0.000000	0.010000	400.000000
6671	11412	Dev_Irrigated-D-Low-Unconfined	2	0.417402	0.010000	400.000000
6671	11421	Dev_Irrigated-D-Med-Confined	2	0.000000	0.010000	300.000000
6671	11422	Dev_Irrigated-D-Med-Unconfined	2	0.000000	0.010000	300.000000
6671	12111	Dev_Pervious-A-Low-Confined	2	0.000000	0.010000	400.000000
6671	12112	Dev_Pervious-A-Low-Unconfined	2	0.000000	0.010000	400.000000
6671	12121	Dev_Pervious-A-Med-Confined	2	0.000000	0.010000	300.000000
6671	12122	Dev_Pervious-A-Med-Unconfined	2	0.000000	0.010000	300.000000
6671	12211	Dev_Pervious-B-Low-Confined	2	0.000000	0.010000	400.000000
6671	12212	Dev_Pervious-B-Low-Unconfined	2	0.000000	0.010000	400.000000
6671	12221	Dev_Pervious-B-Med-Confined	2	0.000000	0.010000	300.000000
6671	12222	Dev_Pervious-B-Med-Unconfined	2	0.000000	0.010000	300.000000
6671	12311	Dev_Pervious-C-Low-Confined	2	0.000000	0.010000	400.000000
6671	12312	Dev_Pervious-C-Low-Unconfined	2	0.000000	0.010000	400.000000
6671	12321	Dev_Pervious-C-Med-Confined	2	0.000000	0.010000	300.000000
6671	12322	Dev_Pervious-C-Med-Unconfined	2	0.000000	0.010000	300.000000
6671	12411	Dev_Pervious-D-Low-Confined	2	0.000000	0.010000	400.000000
6671	12412	Dev_Pervious-D-Low-Unconfined	2	1.110206	0.010000	400.000000
6671	12421	Dev_Pervious-D-Med-Confined	2	0.000000	0.010000	300.000000
6671	12422	Dev_Pervious-D-Med-Unconfined	2	0.000000	0.010000	300.000000
6671	13111	Agriculture-A-Low-Confined	2	0.000000	0.010000	400.000000
6671	13112	Agriculture-A-Low-Unconfined	2	0.000000	0.010000	400.000000
6671	13121	Agriculture-A-Med-Confined	2	0.000000	0.010000	300.000000
6671	13122	Agriculture-A-Med-Unconfined	2	0.000000	0.010000	300.000000
6671	13211	Agriculture-B-Low-Confined	2	0.000000	0.010000	400.000000
6671	13212	Agriculture-B-Low-Unconfined	2	0.000000	0.010000	400.000000
6671	13221	Agriculture-B-Med-Confined	2	0.000000	0.010000	300.000000
6671	13222	Agriculture-B-Med-Unconfined	2	0.000000	0.010000	300.000000
6671	13231	Agriculture-B-High-Confined	2	0.000000	0.010000	400.000000
6671	13232	Agriculture-B-High-Unconfined	2	0.000000	0.010000	400.000000
6671	13311	Agriculture-C-Low-Confined	2	0.000000	0.010000	400.000000
6671	13312	Agriculture-C-Low-Unconfined	2	0.000000	0.010000	400.000000
6671	13321	Agriculture-C-Med-Confined	2	0.000000	0.010000	300.000000
6671	13322	Agriculture-C-Med-Unconfined	2	0.000000	0.010000	300.000000
6671	13331	Agriculture-C-High-Confined	2	0.000000	0.010000	400.000000
6671	13411	Agriculture-D-Low-Confined	2	0.000000	0.010000	400.000000
6671	13412	Agriculture-D-Low-Unconfined	2	0.000000	0.010000	400.000000
6671	13421	Agriculture-D-Med-Confined	2	0.000000	0.010000	300.000000
6671	13422	Agriculture-D-Med-Unconfined	2	0.000000	0.010000	300.000000
6671	13431	Agriculture-D-High-Confined	2	0.000000	0.010000	400.000000
6671	13432	Agriculture-D-High-Unconfined	2	0.000000	0.010000	400.000000
6671	14121	Veg_Low-A-Med-Confined	2	0.000000	0.010000	300.000000
6671	14122	Veg_Low-A-Med-Unconfined	2	0.000000	0.010000	300.000000
6671	14131	Veg_Low-A-High-Confined	2	0.000000	0.010000	400.000000
6671	14132	Veg_Low-A-High-Unconfined	2	0.000000	0.010000	400.000000
6671	14221	Veg_Low-B-Med-Confined	2	0.000000	0.010000	300.000000
6671	14222	Veg_Low-B-Med-Unconfined	2	0.000000	0.010000	300.000000
6671	14231	Veg_Low-B-High-Confined	2	0.000000	0.010000	400.000000
6671	14232	Veg_Low-B-High-Unconfined	2	0.000000	0.010000	400.000000
6671	14321	Veg_Low-C-Med-Confined	2	0.000000	0.010000	300.000000
6671	14322	Veg_Low-C-Med-Unconfined	2	0.000000	0.010000	300.000000
6671	14331	Veg_Low-C-High-Confined	2	0.000000	0.010000	400.000000
6671	14332	Veg_Low-C-High-Unconfined	2	0.000000	0.010000	400.000000
6671	14421	Veg_Low-D-Med-Confined	2	0.000000	0.010000	300.000000
6671	14422	Veg_Low-D-Med-Unconfined	2	2.005914	0.010000	300.000000
6671	14431	Veg_Low-D-High-Confined	2	0.000000	0.010000	400.000000
6671	14432	Veg_Low-D-High-Unconfined	2	0.000000	0.010000	400.000000
6671	15121	Veg_High-A-Med-Confined	2	0.000000	0.010000	300.000000
6671	15122	Veg_High-A-Med-Unconfined	2	0.000000	0.010000	300.000000
6671	15131	Veg_High-A-High-Confined	2	0.000000	0.010000	400.000000
```

```
6671	15132	Veg_High-A-High-Unconfined	2	0.000000	0.010000	400.000000
6671	15221	Veg_High-B-Med-Confined	2	0.000000	0.010000	300.000000
6671	15222	Veg_High-B-Med-Unconfined	2	0.000000	0.010000	300.000000
6671	15231	Veg_High-B-High-Confined	2	0.000000	0.010000	400.000000
6671	15232	Veg_High-B-High-Unconfined	2	0.000000	0.010000	400.000000
6671	15321	Veg_High-C-Med-Confined	2	0.000000	0.010000	300.000000
6671	15322	Veg_High-C-Med-Unconfined	2	0.000000	0.010000	300.000000
6671	15331	Veg_High-C-High-Confined	2	0.000000	0.010000	400.000000
6671	15332	Veg_High-C-High-Unconfined	2	0.000000	0.010000	400.000000
6671	15421	Veg_High-D-Med-Confined	2	0.000000	0.010000	300.000000
6671	15422	Veg_High-D-Med-Unconfined	2	4.574342	0.010000	300.000000
6671	15431	Veg_High-D-High-Confined	2	0.000000	0.010000	400.000000
6671	15432	Veg_High-D-High-Unconfined	2	0.000000	0.010000	400.000000
6671	16000	Water-All-All-All	1	0.000000	0.010000	100.000000
6673	1000	Road_Freeway-All-All-All	1	0.000000	0.010000	100.000000
6673	2000	Road_Primary-All-All-All	1	0.481529	0.010000	100.000000
6673	3000	Road_Minor-All-All-All	1	2.956772	0.010000	100.000000
6673	4000	Dev_ResHigh-All-All-All	1	0.000000	0.010000	100.000000
6673	5000	Dev_ResLow-All-All-All	1	0.000000	0.010000	100.000000
6673	6000	Dev_Com-All-All-All	1	1.290964	0.010000	100.000000
6673	7000	Dev_Ind-All-All-All	1	6.885027	0.010000	100.000000
6673	8000	Dev_Inst-All-All-All	1	4.118302	0.010000	100.000000
6673	9000	Dev_Roof-All-All-All	1	6.831145	0.010000	100.000000
6673	10000	Dev_Overspray-All-All-All	1	0.053652	0.010000	100.000000
6673	11111	Dev_Irrigated-A-Low-Confined	2	0.000000	0.010000	400.000000
6673	11112	Dev_Irrigated-A-Low-Unconfined		2	0.000000	0.010000	400.000000
6673	11121	Dev_Irrigated-A-Med-Confined	2	0.000000	0.010000	300.000000
6673	11122	Dev_Irrigated-A-Med-Unconfined		2	0.000000	0.010000	300.000000
6673	11211	Dev_Irrigated-B-Low-Confined	2	0.000000	0.010000	400.000000
6673	11212	Dev_Irrigated-B-Low-Unconfined		2	0.000000	0.010000	400.000000
6673	11221	Dev_Irrigated-B-Med-Confined	2	0.000000	0.010000	300.000000
6673	11222	Dev_Irrigated-B-Med-Unconfined		2	0.000000	0.010000	300.000000
6673	11311	Dev_Irrigated-C-Low-Confined	2	0.000000	0.010000	400.000000
6673	11312	Dev_Irrigated-C-Low-Unconfined		2	0.000000	0.010000	400.000000
6673	11321	Dev_Irrigated-C-Med-Confined	2	0.000000	0.010000	300.000000
6673	11322	Dev_Irrigated-C-Med-Unconfined		2	0.000000	0.010000	300.000000
6673	11411	Dev_Irrigated-D-Low-Confined	2	0.000000	0.010000	400.000000
6673	11412	Dev_Irrigated-D-Low-Unconfined		2	0.074199	0.010000	400.000000
6673	11421	Dev_Irrigated-D-Med-Confined	2	0.000000	0.010000	300.000000
6673	11422	Dev_Irrigated-D-Med-Unconfined		2	0.000000	0.010000	300.000000
6673	12111	Dev_Pervious-A-Low-Confined	2	0.000000	0.010000	400.000000
6673	12112	Dev_Pervious-A-Low-Unconfined	2	0.000000	0.010000	400.000000
6673	12121	Dev_Pervious-A-Med-Confined	2	0.000000	0.010000	300.000000
6673	12122	Dev_Pervious-A-Med-Unconfined	2	0.000000	0.010000	300.000000
6673	12211	Dev_Pervious-B-Low-Confined	2	0.000000	0.010000	400.000000
6673	12212	Dev_Pervious-B-Low-Unconfined	2	0.000000	0.010000	400.000000
6673	12221	Dev_Pervious-B-Med-Confined	2	0.000000	0.010000	300.000000
6673	12222	Dev_Pervious-B-Med-Unconfined	2	0.000000	0.010000	300.000000
6673	12311	Dev_Pervious-C-Low-Confined	2	0.000000	0.010000	400.000000
6673	12312	Dev_Pervious-C-Low-Unconfined	2	0.000000	0.010000	400.000000
6673	12321	Dev_Pervious-C-Med-Confined	2	0.000000	0.010000	300.000000
6673	12322	Dev_Pervious-C-Med-Unconfined	2	0.000000	0.010000	300.000000
6673	12411	Dev_Pervious-D-Low-Confined	2	0.000000	0.010000	400.000000
6673	12412	Dev_Pervious-D-Low-Unconfined	2	0.203030	0.010000	400.000000
6673	12421	Dev_Pervious-D-Med-Confined	2	0.000000	0.010000	300.000000
6673	12422	Dev_Pervious-D-Med-Unconfined	2	0.000000	0.010000	300.000000
6673	13111	Agriculture-A-Low-Confined	2	0.000000	0.010000	400.000000
6673	13112	Agriculture-A-Low-Unconfined	2	0.000000	0.010000	400.000000
6673	13121	Agriculture-A-Med-Confined	2	0.000000	0.010000	300.000000
6673	13122	Agriculture-A-Med-Unconfined	2	0.000000	0.010000	300.000000
6673	13211	Agriculture-B-Low-Confined	2	0.000000	0.010000	400.000000
6673	13212	Agriculture-B-Low-Unconfined	2	0.000000	0.010000	400.000000
6673	13221	Agriculture-B-Med-Confined	2	0.000000	0.010000	300.000000
6673	13222	Agriculture-B-Med-Unconfined	2	0.000000	0.010000	300.000000
6673	13231	Agriculture-B-High-Confined	2	0.000000	0.010000	400.000000
6673	13232	Agriculture-B-High-Unconfined	2	0.000000	0.010000	400.000000
6673	13311	Agriculture-C-Low-Confined	2	0.000000	0.010000	400.000000
6673	13312	Agriculture-C-Low-Unconfined	2	0.000000	0.010000	400.000000
6673	13321	Agriculture-C-Med-Confined	2	0.000000	0.010000	300.000000
6673	13322	Agriculture-C-Med-Unconfined	2	0.000000	0.010000	300.000000
6673	13331	Agriculture-C-High-Confined	2	0.000000	0.010000	400.000000
6673	13411	Agriculture-D-Low-Confined	2	0.000000	0.010000	400.000000
6673	13412	Agriculture-D-Low-Unconfined	2	0.000000	0.010000	400.000000
6673	13421	Agriculture-D-Med-Confined	2	0.000000	0.010000	300.000000
6673	13422	Agriculture-D-Med-Unconfined	2	0.000000	0.010000	300.000000
6673	13431	Agriculture-D-High-Confined	2	0.000000	0.010000	400.000000
6673	13432	Agriculture-D-High-Unconfined	2	0.000000	0.010000	400.000000
6673	14121	Veg_Low-A-Med-Confined	2	0.000000	0.010000	300.000000
6673	14122	Veg_Low-A-Med-Unconfined	2	0.000000	0.010000	300.000000
```

| | | | | | | |
|---|---|---|---|---|---|---|
| 6673 | 14131 | Veg_Low-A-High-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6673 | 14132 | Veg_Low-A-High-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6673 | 14221 | Veg_Low-B-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6673 | 14222 | Veg_Low-B-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6673 | 14231 | Veg_Low-B-High-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6673 | 14232 | Veg_Low-B-High-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6673 | 14321 | Veg_Low-C-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6673 | 14322 | Veg_Low-C-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6673 | 14331 | Veg_Low-C-High-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6673 | 14332 | Veg_Low-C-High-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6673 | 14421 | Veg_Low-D-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6673 | 14422 | Veg_Low-D-Med-Unconfined | 2 | 1.045365 | 0.010000 | 300.000000 |
| 6673 | 14431 | Veg_Low-D-High-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6673 | 14432 | Veg_Low-D-High-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6673 | 15121 | Veg_High-A-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6673 | 15122 | Veg_High-A-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6673 | 15131 | Veg_High-A-High-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6673 | 15132 | Veg_High-A-High-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6673 | 15221 | Veg_High-B-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6673 | 15222 | Veg_High-B-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6673 | 15231 | Veg_High-B-High-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6673 | 15232 | Veg_High-B-High-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6673 | 15321 | Veg_High-C-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6673 | 15322 | Veg_High-C-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6673 | 15331 | Veg_High-C-High-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6673 | 15332 | Veg_High-C-High-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6673 | 15421 | Veg_High-D-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6673 | 15422 | Veg_High-D-Med-Unconfined | 2 | 0.573705 | 0.010000 | 300.000000 |
| 6673 | 15431 | Veg_High-D-High-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6673 | 15432 | Veg_High-D-High-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6673 | 16000 | Water-All-All-All | 1 | 0.000000 | 0.010000 | 100.000000 |
| 6674 | 1000 | Road_Freeway-All-All-All | 1 | 0.000000 | 0.010000 | 100.000000 |
| 6674 | 2000 | Road_Primary-All-All-All | 1 | 2.925525 | 0.010000 | 100.000000 |
| 6674 | 3000 | Road_Minor-All-All-All | 1 | 0.614918 | 0.010000 | 100.000000 |
| 6674 | 4000 | Dev_ResHigh-All-All-All | 1 | 0.000000 | 0.010000 | 100.000000 |
| 6674 | 5000 | Dev_ResLow-All-All-All | 1 | 0.000000 | 0.010000 | 100.000000 |
| 6674 | 6000 | Dev_Com-All-All-All | 1 | 2.889121 | 0.010000 | 100.000000 |
| 6674 | 7000 | Dev_Ind-All-All-All | 1 | 0.000000 | 0.010000 | 100.000000 |
| 6674 | 8000 | Dev_Inst-All-All-All | 1 | 0.000000 | 0.010000 | 100.000000 |
| 6674 | 9000 | Dev_Roof-All-All-All | 1 | 6.797795 | 0.010000 | 100.000000 |
| 6674 | 10000 | Dev_Overspray-All-All-All | 1 | 0.098764 | 0.010000 | 100.000000 |
| 6674 | 11111 | Dev_Irrigated-A-Low-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6674 | 11112 | Dev_Irrigated-A-Low-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6674 | 11121 | Dev_Irrigated-A-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6674 | 11122 | Dev_Irrigated-A-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6674 | 11211 | Dev_Irrigated-B-Low-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6674 | 11212 | Dev_Irrigated-B-Low-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6674 | 11221 | Dev_Irrigated-B-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6674 | 11222 | Dev_Irrigated-B-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6674 | 11311 | Dev_Irrigated-C-Low-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6674 | 11312 | Dev_Irrigated-C-Low-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6674 | 11321 | Dev_Irrigated-C-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6674 | 11322 | Dev_Irrigated-C-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6674 | 11411 | Dev_Irrigated-D-Low-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6674 | 11412 | Dev_Irrigated-D-Low-Unconfined | 2 | 0.029689 | 0.010000 | 400.000000 |
| 6674 | 11421 | Dev_Irrigated-D-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6674 | 11422 | Dev_Irrigated-D-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6674 | 12111 | Dev_Pervious-A-Low-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6674 | 12112 | Dev_Pervious-A-Low-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6674 | 12121 | Dev_Pervious-A-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6674 | 12122 | Dev_Pervious-A-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6674 | 12211 | Dev_Pervious-B-Low-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6674 | 12212 | Dev_Pervious-B-Low-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6674 | 12221 | Dev_Pervious-B-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6674 | 12222 | Dev_Pervious-B-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6674 | 12311 | Dev_Pervious-C-Low-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6674 | 12312 | Dev_Pervious-C-Low-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6674 | 12321 | Dev_Pervious-C-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6674 | 12322 | Dev_Pervious-C-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6674 | 12411 | Dev_Pervious-D-Low-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6674 | 12412 | Dev_Pervious-D-Low-Unconfined | 2 | 0.067237 | 0.010000 | 400.000000 |
| 6674 | 12421 | Dev_Pervious-D-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6674 | 12422 | Dev_Pervious-D-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6674 | 13111 | Agriculture-A-Low-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6674 | 13112 | Agriculture-A-Low-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6674 | 13121 | Agriculture-A-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6674 | 13122 | Agriculture-A-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6674 | 13211 | Agriculture-B-Low-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6674 | 13212 | Agriculture-B-Low-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |

| | | | | | | |
|---|---|---|---|---|---|---|
| 6674 | 13221 | Agriculture-B-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6674 | 13222 | Agriculture-B-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6674 | 13231 | Agriculture-B-High-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6674 | 13232 | Agriculture-B-High-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6674 | 13311 | Agriculture-C-Low-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6674 | 13312 | Agriculture-C-Low-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6674 | 13321 | Agriculture-C-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6674 | 13322 | Agriculture-C-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6674 | 13331 | Agriculture-C-High-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6674 | 13411 | Agriculture-D-Low-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6674 | 13412 | Agriculture-D-Low-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6674 | 13421 | Agriculture-D-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6674 | 13422 | Agriculture-D-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6674 | 13431 | Agriculture-D-High-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6674 | 13432 | Agriculture-D-High-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6674 | 14121 | Veg_Low-A-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6674 | 14122 | Veg_Low-A-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6674 | 14131 | Veg_Low-A-High-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6674 | 14132 | Veg_Low-A-High-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6674 | 14221 | Veg_Low-B-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6674 | 14222 | Veg_Low-B-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6674 | 14231 | Veg_Low-B-High-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6674 | 14232 | Veg_Low-B-High-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6674 | 14321 | Veg_Low-C-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6674 | 14322 | Veg_Low-C-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6674 | 14331 | Veg_Low-C-High-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6674 | 14332 | Veg_Low-C-High-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6674 | 14421 | Veg_Low-D-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6674 | 14422 | Veg_Low-D-Med-Unconfined | 2 | 0.499460 | 0.010000 | 300.000000 |
| 6674 | 14431 | Veg_Low-D-High-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6674 | 14432 | Veg_Low-D-High-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6674 | 15121 | Veg_High-A-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6674 | 15122 | Veg_High-A-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6674 | 15131 | Veg_High-A-High-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6674 | 15132 | Veg_High-A-High-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6674 | 15221 | Veg_High-B-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6674 | 15222 | Veg_High-B-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6674 | 15231 | Veg_High-B-High-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6674 | 15232 | Veg_High-B-High-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6674 | 15321 | Veg_High-C-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6674 | 15322 | Veg_High-C-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6674 | 15331 | Veg_High-C-High-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6674 | 15332 | Veg_High-C-High-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6674 | 15421 | Veg_High-D-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6674 | 15422 | Veg_High-D-Med-Unconfined | 2 | 0.817424 | 0.010000 | 300.000000 |
| 6674 | 15431 | Veg_High-D-High-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6674 | 15432 | Veg_High-D-High-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6674 | 16000 | Water-All-All-All | 1 | 0.000000 | 0.010000 | 100.000000 |
| 6675 | 1000 | Road_Freeway-All-All-All | 1 | 0.000000 | 0.010000 | 100.000000 |
| 6675 | 2000 | Road_Primary-All-All-All | 1 | 1.937187 | 0.010000 | 100.000000 |
| 6675 | 3000 | Road_Minor-All-All-All | 1 | 0.156881 | 0.010000 | 100.000000 |
| 6675 | 4000 | Dev_ResHigh-All-All-All | 1 | 0.736092 | 0.010000 | 100.000000 |
| 6675 | 5000 | Dev_ResLow-All-All-All | 1 | 0.000000 | 0.010000 | 100.000000 |
| 6675 | 6000 | Dev_Com-All-All-All | 1 | 0.439377 | 0.010000 | 100.000000 |
| 6675 | 7000 | Dev_Ind-All-All-All | 1 | 0.000000 | 0.010000 | 100.000000 |
| 6675 | 8000 | Dev_Inst-All-All-All | 1 | 0.941816 | 0.010000 | 100.000000 |
| 6675 | 9000 | Dev_Roof-All-All-All | 1 | 3.077462 | 0.010000 | 100.000000 |
| 6675 | 10000 | Dev_Overspray-All-All-All | 1 | 0.041320 | 0.010000 | 100.000000 |
| 6675 | 11111 | Dev_Irrigated-A-Low-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6675 | 11112 | Dev_Irrigated-A-Low-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6675 | 11121 | Dev_Irrigated-A-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6675 | 11122 | Dev_Irrigated-A-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6675 | 11211 | Dev_Irrigated-B-Low-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6675 | 11212 | Dev_Irrigated-B-Low-Unconfined | 2 | 0.000000 | 0.040000 | 400.000000 |
| 6675 | 11221 | Dev_Irrigated-B-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6675 | 11222 | Dev_Irrigated-B-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6675 | 11311 | Dev_Irrigated-C-Low-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6675 | 11312 | Dev_Irrigated-C-Low-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6675 | 11321 | Dev_Irrigated-C-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6675 | 11322 | Dev_Irrigated-C-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6675 | 11411 | Dev_Irrigated-D-Low-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6675 | 11412 | Dev_Irrigated-D-Low-Unconfined | 2 | 0.181499 | 0.010000 | 400.000000 |
| 6675 | 11421 | Dev_Irrigated-D-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6675 | 11422 | Dev_Irrigated-D-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6675 | 12111 | Dev_Pervious-A-Low-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6675 | 12112 | Dev_Pervious-A-Low-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6675 | 12121 | Dev_Pervious-A-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6675 | 12122 | Dev_Pervious-A-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6675 | 12211 | Dev_Pervious-B-Low-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |

| | | | | | |
|---|---|---|---|---|---|
| 6675 | 12212 | Dev_Pervious-B-Low-Unconfined | 2 | 0.000000 | 0.040000 | 400.000000 |
| 6675 | 12221 | Dev_Pervious-B-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6675 | 12222 | Dev_Pervious-B-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6675 | 12311 | Dev_Pervious-C-Low-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6675 | 12312 | Dev_Pervious-C-Low-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6675 | 12321 | Dev_Pervious-C-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6675 | 12322 | Dev_Pervious-C-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6675 | 12411 | Dev_Pervious-D-Low-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6675 | 12412 | Dev_Pervious-D-Low-Unconfined | 2 | 0.451767 | 0.010000 | 400.000000 |
| 6675 | 12421 | Dev_Pervious-D-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6675 | 12422 | Dev_Pervious-D-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6675 | 13111 | Agriculture-A-Low-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6675 | 13112 | Agriculture-A-Low-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6675 | 13121 | Agriculture-A-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6675 | 13122 | Agriculture-A-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6675 | 13211 | Agriculture-B-Low-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6675 | 13212 | Agriculture-B-Low-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6675 | 13221 | Agriculture-B-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6675 | 13222 | Agriculture-B-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6675 | 13231 | Agriculture-B-High-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6675 | 13232 | Agriculture-B-High-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6675 | 13311 | Agriculture-C-Low-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6675 | 13312 | Agriculture-C-Low-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6675 | 13321 | Agriculture-C-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6675 | 13322 | Agriculture-C-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6675 | 13331 | Agriculture-C-High-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6675 | 13411 | Agriculture-D-Low-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6675 | 13412 | Agriculture-D-Low-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6675 | 13421 | Agriculture-D-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6675 | 13422 | Agriculture-D-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6675 | 13431 | Agriculture-D-High-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6675 | 13432 | Agriculture-D-High-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6675 | 14121 | Veg_Low-A-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6675 | 14122 | Veg_Low-A-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6675 | 14131 | Veg_Low-A-High-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6675 | 14132 | Veg_Low-A-High-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6675 | 14221 | Veg_Low-B-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6675 | 14222 | Veg_Low-B-Med-Unconfined | 2 | 0.000000 | 0.020000 | 300.000000 |
| 6675 | 14231 | Veg_Low-B-High-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6675 | 14232 | Veg_Low-B-High-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6675 | 14321 | Veg_Low-C-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6675 | 14322 | Veg_Low-C-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6675 | 14331 | Veg_Low-C-High-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6675 | 14332 | Veg_Low-C-High-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6675 | 14421 | Veg_Low-D-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6675 | 14422 | Veg_Low-D-Med-Unconfined | 2 | 0.285731 | 0.010000 | 300.000000 |
| 6675 | 14431 | Veg_Low-D-High-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6675 | 14432 | Veg_Low-D-High-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6675 | 15121 | Veg_High-A-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6675 | 15122 | Veg_High-A-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6675 | 15131 | Veg_High-A-High-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6675 | 15132 | Veg_High-A-High-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6675 | 15221 | Veg_High-B-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6675 | 15222 | Veg_High-B-Med-Unconfined | 2 | 0.000000 | 0.020000 | 300.000000 |
| 6675 | 15231 | Veg_High-B-High-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6675 | 15232 | Veg_High-B-High-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6675 | 15321 | Veg_High-C-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6675 | 15322 | Veg_High-C-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6675 | 15331 | Veg_High-C-High-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6675 | 15332 | Veg_High-C-High-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6675 | 15421 | Veg_High-D-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6675 | 15422 | Veg_High-D-Med-Unconfined | 2 | 1.242093 | 0.010000 | 300.000000 |
| 6675 | 15431 | Veg_High-D-High-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6675 | 15432 | Veg_High-D-High-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6675 | 16000 | Water-All-All-All | 1 | 0.000000 | 0.010000 | 100.000000 |
| 6684 | 1000 | Road_Freeway-All-All-All | 1 | 0.000000 | 0.010000 | 100.000000 |
| 6684 | 2000 | Road_Primary-All-All-All | 1 | 0.139605 | 0.010000 | 100.000000 |
| 6684 | 3000 | Road_Minor-All-All-All | 1 | 0.000000 | 0.010000 | 100.000000 |
| 6684 | 4000 | Dev_ResHigh-All-All-All | 1 | 0.000000 | 0.010000 | 100.000000 |
| 6684 | 5000 | Dev_ResLow-All-All-All | 1 | 0.739849 | 0.010000 | 100.000000 |
| 6684 | 6000 | Dev_Com-All-All-All | 1 | 0.000000 | 0.010000 | 100.000000 |
| 6684 | 7000 | Dev_Ind-All-All-All | 1 | 0.000000 | 0.010000 | 100.000000 |
| 6684 | 8000 | Dev_Inst-All-All-All | 1 | 0.166684 | 0.010000 | 100.000000 |
| 6684 | 9000 | Dev_Roof-All-All-All | 1 | 0.712684 | 0.010000 | 100.000000 |
| 6684 | 10000 | Dev_Overspray-All-All-All | 1 | 0.029787 | 0.010000 | 100.000000 |
| 6684 | 11111 | Dev_Irrigated-A-Low-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6684 | 11112 | Dev_Irrigated-A-Low-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6684 | 11121 | Dev_Irrigated-A-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6684 | 11122 | Dev_Irrigated-A-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |

```
6684	11211	Dev_Irrigated-B-Low-Confined	2	0.000000	0.010000	400.000000
6684	11212	Dev_Irrigated-B-Low-Unconfined		2	0.000000	0.010000	400.000000
6684	11221	Dev_Irrigated-B-Med-Confined	2	0.000000	0.010000	300.000000
6684	11222	Dev_Irrigated-B-Med-Unconfined		2	0.000000	0.010000	300.000000
6684	11311	Dev_Irrigated-C-Low-Confined	2	0.000000	0.010000	400.000000
6684	11312	Dev_Irrigated-C-Low-Unconfined		2	0.000000	0.010000	400.000000
6684	11321	Dev_Irrigated-C-Med-Confined	2	0.000000	0.010000	300.000000
6684	11322	Dev_Irrigated-C-Med-Unconfined		2	0.000000	0.010000	300.000000
6684	11411	Dev_Irrigated-D-Low-Confined	2	0.000000	0.010000	400.000000
6684	11412	Dev_Irrigated-D-Low-Unconfined		2	0.059527	0.010000	400.000000
6684	11421	Dev_Irrigated-D-Med-Confined	2	0.000000	0.010000	300.000000
6684	11422	Dev_Irrigated-D-Med-Unconfined		2	0.000000	0.010000	300.000000
6684	12111	Dev_Pervious-A-Low-Confined	2	0.000000	0.010000	400.000000
6684	12112	Dev_Pervious-A-Low-Unconfined	2	0.000000	0.010000	400.000000
6684	12121	Dev_Pervious-A-Med-Confined	2	0.000000	0.010000	300.000000
6684	12122	Dev_Pervious-A-Med-Unconfined	2	0.000000	0.010000	300.000000
6684	12211	Dev_Pervious-B-Low-Confined	2	0.000000	0.010000	400.000000
6684	12212	Dev_Pervious-B-Low-Unconfined	2	0.000000	0.010000	400.000000
6684	12221	Dev_Pervious-B-Med-Confined	2	0.000000	0.010000	300.000000
6684	12222	Dev_Pervious-B-Med-Unconfined	2	0.000000	0.010000	300.000000
6684	12311	Dev_Pervious-C-Low-Confined	2	0.000000	0.010000	400.000000
6684	12312	Dev_Pervious-C-Low-Unconfined	2	0.000000	0.010000	400.000000
6684	12321	Dev_Pervious-C-Med-Confined	2	0.000000	0.010000	300.000000
6684	12322	Dev_Pervious-C-Med-Unconfined	2	0.000000	0.010000	300.000000
6684	12411	Dev_Pervious-D-Low-Confined	2	0.000000	0.010000	400.000000
6684	12412	Dev_Pervious-D-Low-Unconfined	2	0.195329	0.010000	400.000000
6684	12421	Dev_Pervious-D-Med-Confined	2	0.000000	0.010000	300.000000
6684	12422	Dev_Pervious-D-Med-Unconfined	2	0.000000	0.010000	300.000000
6684	13111	Agriculture-A-Low-Confined	2	0.000000	0.010000	400.000000
6684	13112	Agriculture-A-Low-Unconfined	2	0.000000	0.010000	400.000000
6684	13121	Agriculture-A-Med-Confined	2	0.000000	0.010000	300.000000
6684	13122	Agriculture-A-Med-Unconfined	2	0.000000	0.010000	300.000000
6684	13211	Agriculture-B-Low-Confined	2	0.000000	0.010000	400.000000
6684	13212	Agriculture-B-Low-Unconfined	2	0.000000	0.010000	400.000000
6684	13221	Agriculture-B-Med-Confined	2	0.000000	0.010000	300.000000
6684	13222	Agriculture-B-Med-Unconfined	2	0.000000	0.010000	300.000000
6684	13231	Agriculture-B-High-Confined	2	0.000000	0.010000	400.000000
6684	13232	Agriculture-B-High-Unconfined	2	0.000000	0.010000	400.000000
6684	13311	Agriculture-C-Low-Confined	2	0.000000	0.010000	400.000000
6684	13312	Agriculture-C-Low-Unconfined	2	0.000000	0.010000	400.000000
6684	13321	Agriculture-C-Med-Confined	2	0.000000	0.010000	300.000000
6684	13322	Agriculture-C-Med-Unconfined	2	0.000000	0.010000	300.000000
6684	13331	Agriculture-C-High-Confined	2	0.000000	0.010000	400.000000
6684	13411	Agriculture-D-Low-Confined	2	0.000000	0.010000	400.000000
6684	13412	Agriculture-D-Low-Unconfined	2	0.000000	0.010000	400.000000
6684	13421	Agriculture-D-Med-Confined	2	0.000000	0.010000	300.000000
6684	13422	Agriculture-D-Med-Unconfined	2	0.000000	0.010000	300.000000
6684	13431	Agriculture-D-High-Confined	2	0.000000	0.010000	400.000000
6684	13432	Agriculture-D-High-Unconfined	2	0.000000	0.010000	400.000000
6684	14121	Veg_Low-A-Med-Confined	2	0.000000	0.010000	300.000000
6684	14122	Veg_Low-A-Med-Unconfined	2	0.000000	0.010000	300.000000
6684	14131	Veg_Low-A-High-Confined	2	0.000000	0.010000	400.000000
6684	14132	Veg_Low-A-High-Unconfined	2	0.000000	0.010000	400.000000
6684	14221	Veg_Low-B-Med-Confined	2	0.000000	0.010000	300.000000
6684	14222	Veg_Low-B-Med-Unconfined	2	0.000000	0.010000	300.000000
6684	14231	Veg_Low-B-High-Confined	2	0.000000	0.010000	400.000000
6684	14232	Veg_Low-B-High-Unconfined	2	0.000000	0.010000	400.000000
6684	14321	Veg_Low-C-Med-Confined	2	0.000000	0.010000	300.000000
6684	14322	Veg_Low-C-Med-Unconfined	2	0.000000	0.010000	300.000000
6684	14331	Veg_Low-C-High-Confined	2	0.000000	0.010000	400.000000
6684	14332	Veg_Low-C-High-Unconfined	2	0.000000	0.010000	400.000000
6684	14421	Veg_Low-D-Med-Confined	2	0.000000	0.010000	300.000000
6684	14422	Veg_Low-D-Med-Unconfined	2	0.396905	0.010000	300.000000
6684	14431	Veg_Low-D-High-Confined	2	0.000000	0.010000	400.000000
6684	14432	Veg_Low-D-High-Unconfined	2	0.000000	0.010000	400.000000
6684	15121	Veg_High-A-Med-Confined	2	0.000000	0.010000	300.000000
6684	15122	Veg_High-A-Med-Unconfined	2	0.000000	0.010000	300.000000
6684	15131	Veg_High-A-High-Confined	2	0.000000	0.010000	400.000000
6684	15132	Veg_High-A-High-Unconfined	2	0.000000	0.010000	400.000000
6684	15221	Veg_High-B-Med-Confined	2	0.000000	0.010000	300.000000
6684	15222	Veg_High-B-Med-Unconfined	2	0.000000	0.010000	300.000000
6684	15231	Veg_High-B-High-Confined	2	0.000000	0.010000	400.000000
6684	15232	Veg_High-B-High-Unconfined	2	0.000000	0.010000	400.000000
6684	15321	Veg_High-C-Med-Confined	2	0.000000	0.010000	300.000000
6684	15322	Veg_High-C-Med-Unconfined	2	0.000000	0.010000	300.000000
6684	15331	Veg_High-C-High-Confined	2	0.000000	0.010000	400.000000
6684	15332	Veg_High-C-High-Unconfined	2	0.000000	0.010000	400.000000
6684	15421	Veg_High-D-Med-Confined	2	0.000000	0.010000	300.000000
6684	15422	Veg_High-D-Med-Unconfined	2	0.628041	0.010000	300.000000
```

| | | | | | | |
|---|---|---|---|---|---|---|
| 6684 | 15431 | Veg_High-D-High-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6684 | 15432 | Veg_High-D-High-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6684 | 16000 | Water-All-All-All | 1 | 0.000000 | 0.010000 | 100.000000 |
| 6839 | 1000 | Road_Freeway-All-All-All | 1 | 0.000000 | 0.010000 | 100.000000 |
| 6839 | 2000 | Road_Primary-All-All-All | 1 | 12.914056 | 0.010000 | 100.000000 |
| 6839 | 3000 | Road_Minor-All-All-All | 1 | 22.882187 | 0.010000 | 100.000000 |
| 6839 | 4000 | Dev_ResHigh-All-All-All | 1 | 4.661385 | 0.010000 | 100.000000 |
| 6839 | 5000 | Dev_ResLow-All-All-All | 1 | 25.629873 | 0.010000 | 100.000000 |
| 6839 | 6000 | Dev_Com-All-All-All | 1 | 6.709273 | 0.010000 | 100.000000 |
| 6839 | 7000 | Dev_Ind-All-All-All | 1 | 0.006919 | 0.010000 | 100.000000 |
| 6839 | 8000 | Dev_Inst-All-All-All | 1 | 6.110366 | 0.010000 | 100.000000 |
| 6839 | 9000 | Dev_Roof-All-All-All | 1 | 69.593855 | 0.010000 | 100.000000 |
| 6839 | 10000 | Dev_Overspray-All-All-All | 1 | 1.549902 | 0.010000 | 100.000000 |
| 6839 | 11111 | Dev_Irrigated-A-Low-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6839 | 11112 | Dev_Irrigated-A-Low-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6839 | 11121 | Dev_Irrigated-A-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6839 | 11122 | Dev_Irrigated-A-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6839 | 11211 | Dev_Irrigated-B-Low-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6839 | 11212 | Dev_Irrigated-B-Low-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6839 | 11221 | Dev_Irrigated-B-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6839 | 11222 | Dev_Irrigated-B-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6839 | 11311 | Dev_Irrigated-C-Low-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6839 | 11312 | Dev_Irrigated-C-Low-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6839 | 11321 | Dev_Irrigated-C-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6839 | 11322 | Dev_Irrigated-C-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6839 | 11411 | Dev_Irrigated-D-Low-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6839 | 11412 | Dev_Irrigated-D-Low-Unconfined | 2 | 9.868122 | 0.010000 | 400.000000 |
| 6839 | 11421 | Dev_Irrigated-D-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6839 | 11422 | Dev_Irrigated-D-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6839 | 12111 | Dev_Pervious-A-Low-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6839 | 12112 | Dev_Pervious-A-Low-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6839 | 12121 | Dev_Pervious-A-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6839 | 12122 | Dev_Pervious-A-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6839 | 12211 | Dev_Pervious-B-Low-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6839 | 12212 | Dev_Pervious-B-Low-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6839 | 12221 | Dev_Pervious-B-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6839 | 12222 | Dev_Pervious-B-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6839 | 12311 | Dev_Pervious-C-Low-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6839 | 12312 | Dev_Pervious-C-Low-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6839 | 12321 | Dev_Pervious-C-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6839 | 12322 | Dev_Pervious-C-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6839 | 12411 | Dev_Pervious-D-Low-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6839 | 12412 | Dev_Pervious-D-Low-Unconfined | 2 | 27.470649 | 0.010000 | 400.000000 |
| 6839 | 12421 | Dev_Pervious-D-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6839 | 12422 | Dev_Pervious-D-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6839 | 13111 | Agriculture-A-Low-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6839 | 13112 | Agriculture-A-Low-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6839 | 13121 | Agriculture-A-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6839 | 13122 | Agriculture-A-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6839 | 13211 | Agriculture-B-Low-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6839 | 13212 | Agriculture-B-Low-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6839 | 13221 | Agriculture-B-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6839 | 13222 | Agriculture-B-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6839 | 13231 | Agriculture-B-High-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6839 | 13232 | Agriculture-B-High-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6839 | 13311 | Agriculture-C-Low-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6839 | 13312 | Agriculture-C-Low-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6839 | 13321 | Agriculture-C-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6839 | 13322 | Agriculture-C-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6839 | 13331 | Agriculture-C-High-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6839 | 13411 | Agriculture-D-Low-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6839 | 13412 | Agriculture-D-Low-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6839 | 13421 | Agriculture-D-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6839 | 13422 | Agriculture-D-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6839 | 13431 | Agriculture-D-High-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6839 | 13432 | Agriculture-D-High-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6839 | 14121 | Veg_Low-A-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6839 | 14122 | Veg_Low-A-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6839 | 14131 | Veg_Low-A-High-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6839 | 14132 | Veg_Low-A-High-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6839 | 14221 | Veg_Low-B-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6839 | 14222 | Veg_Low-B-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6839 | 14231 | Veg_Low-B-High-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6839 | 14232 | Veg_Low-B-High-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6839 | 14321 | Veg_Low-C-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6839 | 14322 | Veg_Low-C-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6839 | 14331 | Veg_Low-C-High-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6839 | 14332 | Veg_Low-C-High-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6839 | 14421 | Veg_Low-D-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |

| | | | | | | |
|---|---|---|---|---|---|---|
| 6839 | 14422 | Veg_Low-D-Med-Unconfined | 2 | 11.789382 | 0.010000 | 300.000000 |
| 6839 | 14431 | Veg_Low-D-High-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6839 | 14432 | Veg_Low-D-High-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6839 | 15121 | Veg_High-A-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6839 | 15122 | Veg_High-A-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6839 | 15131 | Veg_High-A-High-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6839 | 15132 | Veg_High-A-High-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6839 | 15221 | Veg_High-B-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6839 | 15222 | Veg_High-B-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6839 | 15231 | Veg_High-B-High-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6839 | 15232 | Veg_High-B-High-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6839 | 15321 | Veg_High-C-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6839 | 15322 | Veg_High-C-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6839 | 15331 | Veg_High-C-High-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6839 | 15332 | Veg_High-C-High-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6839 | 15421 | Veg_High-D-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6839 | 15422 | Veg_High-D-Med-Unconfined | 2 | 92.507385 | 0.010000 | 300.000000 |
| 6839 | 15431 | Veg_High-D-High-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6839 | 15432 | Veg_High-D-High-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6839 | 16000 | Water-All-All-All | 1 | 0.000000 | 0.010000 | 100.000000 |
| 6844 | 1000 | Road_Freeway-All-All-All | 1 | 0.000000 | 0.030000 | 100.000000 |
| 6844 | 2000 | Road_Primary-All-All-All | 1 | 3.007383 | 0.020000 | 100.000000 |
| 6844 | 3000 | Road_Minor-All-All-All | 1 | 19.497989 | 0.010000 | 100.000000 |
| 6844 | 4000 | Dev_ResHigh-All-All-All | 1 | 3.024602 | 0.020000 | 100.000000 |
| 6844 | 5000 | Dev_ResLow-All-All-All | 1 | 20.169560 | 0.030000 | 100.000000 |
| 6844 | 6000 | Dev_Com-All-All-All | 1 | 2.997446 | 0.020000 | 100.000000 |
| 6844 | 7000 | Dev_Ind-All-All-All | 1 | 0.000000 | 0.010000 | 100.000000 |
| 6844 | 8000 | Dev_Inst-All-All-All | 1 | 0.192866 | 0.020000 | 100.000000 |
| 6844 | 9000 | Dev_Roof-All-All-All | 1 | 46.216685 | 0.020000 | 100.000000 |
| 6844 | 10000 | Dev_Overspray-All-All-All | 1 | 1.159484 | 0.030000 | 100.000000 |
| 6844 | 11111 | Dev_Irrigated-A-Low-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6844 | 11112 | Dev_Irrigated-A-Low-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6844 | 11121 | Dev_Irrigated-A-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6844 | 11122 | Dev_Irrigated-A-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6844 | 11211 | Dev_Irrigated-B-Low-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6844 | 11212 | Dev_Irrigated-B-Low-Unconfined | 2 | 0.000000 | 0.080000 | 400.000000 |
| 6844 | 11221 | Dev_Irrigated-B-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6844 | 11222 | Dev_Irrigated-B-Med-Unconfined | 2 | 0.000000 | 0.050000 | 300.000000 |
| 6844 | 11311 | Dev_Irrigated-C-Low-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6844 | 11312 | Dev_Irrigated-C-Low-Unconfined | 2 | 0.000000 | 0.100000 | 400.000000 |
| 6844 | 11321 | Dev_Irrigated-C-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6844 | 11322 | Dev_Irrigated-C-Med-Unconfined | 2 | 0.000000 | 0.060000 | 300.000000 |
| 6844 | 11411 | Dev_Irrigated-D-Low-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6844 | 11412 | Dev_Irrigated-D-Low-Unconfined | 2 | 7.363181 | 0.010000 | 400.000000 |
| 6844 | 11421 | Dev_Irrigated-D-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6844 | 11422 | Dev_Irrigated-D-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6844 | 12111 | Dev_Pervious-A-Low-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6844 | 12112 | Dev_Pervious-A-Low-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6844 | 12121 | Dev_Pervious-A-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6844 | 12122 | Dev_Pervious-A-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6844 | 12211 | Dev_Pervious-B-Low-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6844 | 12212 | Dev_Pervious-B-Low-Unconfined | 2 | 0.000000 | 0.080000 | 400.000000 |
| 6844 | 12221 | Dev_Pervious-B-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6844 | 12222 | Dev_Pervious-B-Med-Unconfined | 2 | 0.000000 | 0.060000 | 300.000000 |
| 6844 | 12311 | Dev_Pervious-C-Low-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6844 | 12312 | Dev_Pervious-C-Low-Unconfined | 2 | 0.000000 | 0.100000 | 400.000000 |
| 6844 | 12321 | Dev_Pervious-C-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6844 | 12322 | Dev_Pervious-C-Med-Unconfined | 2 | 0.000000 | 0.060000 | 300.000000 |
| 6844 | 12411 | Dev_Pervious-D-Low-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6844 | 12412 | Dev_Pervious-D-Low-Unconfined | 2 | 20.364433 | 0.010000 | 400.000000 |
| 6844 | 12421 | Dev_Pervious-D-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6844 | 12422 | Dev_Pervious-D-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6844 | 13111 | Agriculture-A-Low-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6844 | 13112 | Agriculture-A-Low-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6844 | 13121 | Agriculture-A-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6844 | 13122 | Agriculture-A-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6844 | 13211 | Agriculture-B-Low-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6844 | 13212 | Agriculture-B-Low-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6844 | 13221 | Agriculture-B-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6844 | 13222 | Agriculture-B-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6844 | 13231 | Agriculture-B-High-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6844 | 13232 | Agriculture-B-High-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6844 | 13311 | Agriculture-C-Low-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6844 | 13312 | Agriculture-C-Low-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6844 | 13321 | Agriculture-C-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6844 | 13322 | Agriculture-C-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6844 | 13331 | Agriculture-C-High-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6844 | 13411 | Agriculture-D-Low-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6844 | 13412 | Agriculture-D-Low-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |

| | | | | | | |
|---|---|---|---|---|---|---|
| 6844 | 13421 | Agriculture-D-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6844 | 13422 | Agriculture-D-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6844 | 13431 | Agriculture-D-High-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6844 | 13432 | Agriculture-D-High-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6844 | 14121 | Veg_Low-A-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6844 | 14122 | Veg_Low-A-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6844 | 14131 | Veg_Low-A-High-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6844 | 14132 | Veg_Low-A-High-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6844 | 14221 | Veg_Low-B-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6844 | 14222 | Veg_Low-B-Med-Unconfined | 2 | 0.000000 | 0.040000 | 300.000000 |
| 6844 | 14231 | Veg_Low-B-High-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6844 | 14232 | Veg_Low-B-High-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6844 | 14321 | Veg_Low-C-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6844 | 14322 | Veg_Low-C-Med-Unconfined | 2 | 0.000000 | 0.140000 | 300.000000 |
| 6844 | 14331 | Veg_Low-C-High-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6844 | 14332 | Veg_Low-C-High-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6844 | 14421 | Veg_Low-D-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6844 | 14422 | Veg_Low-D-Med-Unconfined | 2 | 9.600268 | 0.010000 | 300.000000 |
| 6844 | 14431 | Veg_Low-D-High-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6844 | 14432 | Veg_Low-D-High-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6844 | 15121 | Veg_High-A-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6844 | 15122 | Veg_High-A-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6844 | 15131 | Veg_High-A-High-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6844 | 15132 | Veg_High-A-High-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6844 | 15221 | Veg_High-B-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6844 | 15222 | Veg_High-B-Med-Unconfined | 2 | 0.000000 | 0.090000 | 300.000000 |
| 6844 | 15231 | Veg_High-B-High-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6844 | 15232 | Veg_High-B-High-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6844 | 15321 | Veg_High-C-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6844 | 15322 | Veg_High-C-Med-Unconfined | 2 | 0.000000 | 0.110000 | 300.000000 |
| 6844 | 15331 | Veg_High-C-High-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6844 | 15332 | Veg_High-C-High-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6844 | 15421 | Veg_High-D-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6844 | 15422 | Veg_High-D-Med-Unconfined | 2 | 59.234758 | 0.010000 | 300.000000 |
| 6844 | 15431 | Veg_High-D-High-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6844 | 15432 | Veg_High-D-High-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6844 | 16000 | Water-All-All-All | 1 | 0.000000 | 0.010000 | 100.000000 |
| 6850 | 1000 | Road_Freeway-All-All-All | 1 | 0.000000 | 0.020000 | 100.000000 |
| 6850 | 2000 | Road_Primary-All-All-All | 1 | 18.040079 | 0.030000 | 100.000000 |
| 6850 | 3000 | Road_Minor-All-All-All | 1 | 48.751825 | 0.010000 | 100.000000 |
| 6850 | 4000 | Dev_ResHigh-All-All-All | 1 | 30.268389 | 0.010000 | 100.000000 |
| 6850 | 5000 | Dev_ResLow-All-All-All | 1 | 31.657937 | 0.030000 | 100.000000 |
| 6850 | 6000 | Dev_Com-All-All-All | 1 | 30.579716 | 0.030000 | 100.000000 |
| 6850 | 7000 | Dev_Ind-All-All-All | 1 | 13.520361 | 0.010000 | 100.000000 |
| 6850 | 8000 | Dev_Inst-All-All-All | 1 | 43.609048 | 0.010000 | 100.000000 |
| 6850 | 9000 | Dev_Roof-All-All-All | 1 | 161.500194 | 0.010000 | 100.000000 |
| 6850 | 10000 | Dev_Overspray-All-All-All | 1 | 3.769618 | 0.030000 | 100.000000 |
| 6850 | 11111 | Dev_Irrigated-A-Low-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6850 | 11112 | Dev_Irrigated-A-Low-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6850 | 11121 | Dev_Irrigated-A-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6850 | 11122 | Dev_Irrigated-A-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6850 | 11211 | Dev_Irrigated-B-Low-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6850 | 11212 | Dev_Irrigated-B-Low-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6850 | 11221 | Dev_Irrigated-B-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6850 | 11222 | Dev_Irrigated-B-Med-Unconfined | 2 | 0.000000 | 0.080000 | 300.000000 |
| 6850 | 11311 | Dev_Irrigated-C-Low-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6850 | 11312 | Dev_Irrigated-C-Low-Unconfined | 2 | 0.000000 | 0.020000 | 400.000000 |
| 6850 | 11321 | Dev_Irrigated-C-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6850 | 11322 | Dev_Irrigated-C-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6850 | 11411 | Dev_Irrigated-D-Low-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6850 | 11412 | Dev_Irrigated-D-Low-Unconfined | 2 | 11.877303 | 0.010000 | 400.000000 |
| 6850 | 11421 | Dev_Irrigated-D-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6850 | 11422 | Dev_Irrigated-D-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6850 | 12111 | Dev_Pervious-A-Low-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6850 | 12112 | Dev_Pervious-A-Low-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6850 | 12121 | Dev_Pervious-A-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6850 | 12122 | Dev_Pervious-A-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6850 | 12211 | Dev_Pervious-B-Low-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6850 | 12212 | Dev_Pervious-B-Low-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6850 | 12221 | Dev_Pervious-B-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6850 | 12222 | Dev_Pervious-B-Med-Unconfined | 2 | 0.000000 | 0.090000 | 300.000000 |
| 6850 | 12311 | Dev_Pervious-C-Low-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6850 | 12312 | Dev_Pervious-C-Low-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6850 | 12321 | Dev_Pervious-C-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6850 | 12322 | Dev_Pervious-C-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6850 | 12411 | Dev_Pervious-D-Low-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6850 | 12412 | Dev_Pervious-D-Low-Unconfined | 2 | 32.743451 | 0.010000 | 400.000000 |
| 6850 | 12421 | Dev_Pervious-D-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6850 | 12422 | Dev_Pervious-D-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |

|  |  |  |  |  |  |  |
|---|---|---|---|---|---|---|
| 6850 | 13111 | Agriculture-A-Low-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6850 | 13112 | Agriculture-A-Low-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6850 | 13121 | Agriculture-A-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6850 | 13122 | Agriculture-A-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6850 | 13211 | Agriculture-B-Low-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6850 | 13212 | Agriculture-B-Low-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6850 | 13221 | Agriculture-B-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6850 | 13222 | Agriculture-B-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6850 | 13231 | Agriculture-B-High-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6850 | 13232 | Agriculture-B-High-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6850 | 13311 | Agriculture-C-Low-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6850 | 13312 | Agriculture-C-Low-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6850 | 13321 | Agriculture-C-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6850 | 13322 | Agriculture-C-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6850 | 13331 | Agriculture-C-High-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6850 | 13411 | Agriculture-D-Low-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6850 | 13412 | Agriculture-D-Low-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6850 | 13421 | Agriculture-D-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6850 | 13422 | Agriculture-D-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6850 | 13431 | Agriculture-D-High-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6850 | 13432 | Agriculture-D-High-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6850 | 14121 | Veg_Low-A-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6850 | 14122 | Veg_Low-A-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6850 | 14131 | Veg_Low-A-High-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6850 | 14132 | Veg_Low-A-High-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6850 | 14221 | Veg_Low-B-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6850 | 14222 | Veg_Low-B-Med-Unconfined | 2 | 0.000000 | 0.080000 | 300.000000 |
| 6850 | 14231 | Veg_Low-B-High-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6850 | 14232 | Veg_Low-B-High-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6850 | 14321 | Veg_Low-C-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6850 | 14322 | Veg_Low-C-Med-Unconfined | 2 | 0.000000 | 0.020000 | 300.000000 |
| 6850 | 14331 | Veg_Low-C-High-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6850 | 14332 | Veg_Low-C-High-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6850 | 14421 | Veg_Low-D-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6850 | 14422 | Veg_Low-D-Med-Unconfined | 2 | 37.090045 | 0.010000 | 300.000000 |
| 6850 | 14431 | Veg_Low-D-High-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6850 | 14432 | Veg_Low-D-High-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6850 | 15121 | Veg_High-A-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6850 | 15122 | Veg_High-A-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6850 | 15131 | Veg_High-A-High-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6850 | 15132 | Veg_High-A-High-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6850 | 15221 | Veg_High-B-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6850 | 15222 | Veg_High-B-Med-Unconfined | 2 | 0.000000 | 0.100000 | 300.000000 |
| 6850 | 15231 | Veg_High-B-High-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6850 | 15232 | Veg_High-B-High-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6850 | 15321 | Veg_High-C-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6850 | 15322 | Veg_High-C-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6850 | 15331 | Veg_High-C-High-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6850 | 15332 | Veg_High-C-High-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6850 | 15421 | Veg_High-D-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6850 | 15422 | Veg_High-D-Med-Unconfined | 2 | 115.335430 | 0.010000 | 300.000000 |
| 6850 | 15431 | Veg_High-D-High-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6850 | 15432 | Veg_High-D-High-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6850 | 16000 | Water-All-All-All | 1 | 0.000000 | 0.010000 | 100.000000 |
| 6856 | 1000 | Road_Freeway-All-All-All | 1 | 0.000000 | 0.010000 | 100.000000 |
| 6856 | 2000 | Road_Primary-All-All-All | 1 | 18.861129 | 0.010000 | 100.000000 |
| 6856 | 3000 | Road_Minor-All-All-All | 1 | 12.102120 | 0.010000 | 100.000000 |
| 6856 | 4000 | Dev_ResHigh-All-All-All | 1 | 4.400158 | 0.010000 | 100.000000 |
| 6856 | 5000 | Dev_ResLow-All-All-All | 1 | 3.532308 | 0.010000 | 100.000000 |
| 6856 | 6000 | Dev_Com-All-All-All | 1 | 42.667495 | 0.010000 | 100.000000 |
| 6856 | 7000 | Dev_Ind-All-All-All | 1 | 2.707957 | 0.010000 | 100.000000 |
| 6856 | 8000 | Dev_Inst-All-All-All | 1 | 6.163053 | 0.010000 | 100.000000 |
| 6856 | 9000 | Dev_Roof-All-All-All | 1 | 66.139393 | 0.010000 | 100.000000 |
| 6856 | 10000 | Dev_Overspray-All-All-All | 1 | 1.996291 | 0.010000 | 100.000000 |
| 6856 | 11111 | Dev_Irrigated-A-Low-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6856 | 11112 | Dev_Irrigated-A-Low-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6856 | 11121 | Dev_Irrigated-A-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6856 | 11122 | Dev_Irrigated-A-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6856 | 11211 | Dev_Irrigated-B-Low-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6856 | 11212 | Dev_Irrigated-B-Low-Unconfined | 2 | 0.000000 | 0.040000 | 400.000000 |
| 6856 | 11221 | Dev_Irrigated-B-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6856 | 11222 | Dev_Irrigated-B-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6856 | 11311 | Dev_Irrigated-C-Low-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6856 | 11312 | Dev_Irrigated-C-Low-Unconfined | 2 | 0.000000 | 0.020000 | 400.000000 |
| 6856 | 11321 | Dev_Irrigated-C-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6856 | 11322 | Dev_Irrigated-C-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6856 | 11411 | Dev_Irrigated-D-Low-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6856 | 11412 | Dev_Irrigated-D-Low-Unconfined | 2 | 1.994953 | 0.010000 | 400.000000 |
| 6856 | 11421 | Dev_Irrigated-D-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |

| | | | | | | |
|---|---|---|---|---|---|---|
| 6856 | 11422 | Dev_Irrigated-D-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6856 | 12111 | Dev_Pervious-A-Low-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6856 | 12112 | Dev_Pervious-A-Low-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6856 | 12121 | Dev_Pervious-A-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6856 | 12122 | Dev_Pervious-A-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6856 | 12211 | Dev_Pervious-B-Low-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6856 | 12212 | Dev_Pervious-B-Low-Unconfined | 2 | 0.000000 | 0.040000 | 400.000000 |
| 6856 | 12221 | Dev_Pervious-B-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6856 | 12222 | Dev_Pervious-B-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6856 | 12311 | Dev_Pervious-C-Low-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6856 | 12312 | Dev_Pervious-C-Low-Unconfined | 2 | 0.000000 | 0.020000 | 400.000000 |
| 6856 | 12321 | Dev_Pervious-C-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6856 | 12322 | Dev_Pervious-C-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6856 | 12411 | Dev_Pervious-D-Low-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6856 | 12412 | Dev_Pervious-D-Low-Unconfined | 2 | 5.680504 | 0.010000 | 400.000000 |
| 6856 | 12421 | Dev_Pervious-D-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6856 | 12422 | Dev_Pervious-D-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6856 | 13111 | Agriculture-A-Low-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6856 | 13112 | Agriculture-A-Low-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6856 | 13121 | Agriculture-A-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6856 | 13122 | Agriculture-A-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6856 | 13211 | Agriculture-B-Low-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6856 | 13212 | Agriculture-B-Low-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6856 | 13221 | Agriculture-B-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6856 | 13222 | Agriculture-B-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6856 | 13231 | Agriculture-B-High-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6856 | 13232 | Agriculture-B-High-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6856 | 13311 | Agriculture-C-Low-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6856 | 13312 | Agriculture-C-Low-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6856 | 13321 | Agriculture-C-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6856 | 13322 | Agriculture-C-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6856 | 13331 | Agriculture-C-High-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6856 | 13411 | Agriculture-D-Low-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6856 | 13412 | Agriculture-D-Low-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6856 | 13421 | Agriculture-D-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6856 | 13422 | Agriculture-D-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6856 | 13431 | Agriculture-D-High-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6856 | 13432 | Agriculture-D-High-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6856 | 14121 | Veg_Low-A-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6856 | 14122 | Veg_Low-A-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6856 | 14131 | Veg_Low-A-High-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6856 | 14132 | Veg_Low-A-High-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6856 | 14221 | Veg_Low-B-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6856 | 14222 | Veg_Low-B-Med-Unconfined | 2 | 0.000000 | 0.020000 | 300.000000 |
| 6856 | 14231 | Veg_Low-B-High-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6856 | 14232 | Veg_Low-B-High-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6856 | 14321 | Veg_Low-C-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6856 | 14322 | Veg_Low-C-Med-Unconfined | 2 | 0.000000 | 0.020000 | 300.000000 |
| 6856 | 14331 | Veg_Low-C-High-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6856 | 14332 | Veg_Low-C-High-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6856 | 14421 | Veg_Low-D-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6856 | 14422 | Veg_Low-D-Med-Unconfined | 2 | 12.447606 | 0.010000 | 300.000000 |
| 6856 | 14431 | Veg_Low-D-High-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6856 | 14432 | Veg_Low-D-High-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6856 | 15121 | Veg_High-A-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6856 | 15122 | Veg_High-A-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6856 | 15131 | Veg_High-A-High-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6856 | 15132 | Veg_High-A-High-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6856 | 15221 | Veg_High-B-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6856 | 15222 | Veg_High-B-Med-Unconfined | 2 | 0.000000 | 0.020000 | 300.000000 |
| 6856 | 15231 | Veg_High-B-High-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6856 | 15232 | Veg_High-B-High-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6856 | 15321 | Veg_High-C-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6856 | 15322 | Veg_High-C-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6856 | 15331 | Veg_High-C-High-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6856 | 15332 | Veg_High-C-High-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6856 | 15421 | Veg_High-D-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6856 | 15422 | Veg_High-D-Med-Unconfined | 2 | 18.646808 | 0.010000 | 300.000000 |
| 6856 | 15431 | Veg_High-D-High-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6856 | 15432 | Veg_High-D-High-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6856 | 16000 | Water-All-All-All | 1 | 0.000000 | 0.010000 | 100.000000 |
| 6859 | 1000 | Road_Freeway-All-All-All | 1 | 0.000000 | 0.010000 | 100.000000 |
| 6859 | 2000 | Road_Primary-All-All-All | 1 | 21.008865 | 0.020000 | 100.000000 |
| 6859 | 3000 | Road_Minor-All-All-All | 1 | 57.359338 | 0.010000 | 100.000000 |
| 6859 | 4000 | Dev_ResHigh-All-All-All | 1 | 27.022121 | 0.010000 | 100.000000 |
| 6859 | 5000 | Dev_ResLow-All-All-All | 1 | 41.396450 | 0.020000 | 100.000000 |
| 6859 | 6000 | Dev_Com-All-All-All | 1 | 28.203617 | 0.010000 | 100.000000 |
| 6859 | 7000 | Dev_Ind-All-All-All | 1 | 31.876501 | 0.010000 | 100.000000 |
| 6859 | 8000 | Dev_Inst-All-All-All | 1 | 37.128734 | 0.020000 | 100.000000 |

```
6859	9000	Dev_Roof-All-All-All	1	200.677088	0.010000	100.000000
6859	10000	Dev_Overspray-All-All-All	1	3.807016	0.020000	100.000000
6859	11111	Dev_Irrigated-A-Low-Confined	2	0.000000	0.010000	400.000000
6859	11112	Dev_Irrigated-A-Low-Unconfined	2	0.000000	0.010000	400.000000
6859	11121	Dev_Irrigated-A-Med-Confined	2	0.000000	0.010000	300.000000
6859	11122	Dev_Irrigated-A-Med-Unconfined	2	0.000000	0.010000	300.000000
6859	11211	Dev_Irrigated-B-Low-Confined	2	0.000000	0.010000	400.000000
6859	11212	Dev_Irrigated-B-Low-Unconfined	2	0.000000	0.070000	400.000000
6859	11221	Dev_Irrigated-B-Med-Confined	2	0.000000	0.010000	300.000000
6859	11222	Dev_Irrigated-B-Med-Unconfined	2	0.000000	0.060000	300.000000
6859	11311	Dev_Irrigated-C-Low-Confined	2	0.000000	0.010000	400.000000
6859	11312	Dev_Irrigated-C-Low-Unconfined	2	0.000000	0.010000	400.000000
6859	11321	Dev_Irrigated-C-Med-Confined	2	0.000000	0.010000	300.000000
6859	11322	Dev_Irrigated-C-Med-Unconfined	2	0.000000	0.060000	300.000000
6859	11411	Dev_Irrigated-D-Low-Confined	2	0.000000	0.010000	400.000000
6859	11412	Dev_Irrigated-D-Low-Unconfined	2	17.620890	0.010000	400.000000
6859	11421	Dev_Irrigated-D-Med-Confined	2	0.000000	0.010000	300.000000
6859	11422	Dev_Irrigated-D-Med-Unconfined	2	0.000000	0.010000	300.000000
6859	12111	Dev_Pervious-A-Low-Confined	2	0.000000	0.010000	400.000000
6859	12112	Dev_Pervious-A-Low-Unconfined	2	0.000000	0.010000	400.000000
6859	12121	Dev_Pervious-A-Med-Confined	2	0.000000	0.010000	300.000000
6859	12122	Dev_Pervious-A-Med-Unconfined	2	0.000000	0.010000	300.000000
6859	12211	Dev_Pervious-B-Low-Confined	2	0.000000	0.010000	400.000000
6859	12212	Dev_Pervious-B-Low-Unconfined	2	0.000000	0.040000	400.000000
6859	12221	Dev_Pervious-B-Med-Confined	2	0.000000	0.010000	300.000000
6859	12222	Dev_Pervious-B-Med-Unconfined	2	0.000000	0.060000	300.000000
6859	12311	Dev_Pervious-C-Low-Confined	2	0.000000	0.010000	400.000000
6859	12312	Dev_Pervious-C-Low-Unconfined	2	0.000000	0.010000	400.000000
6859	12321	Dev_Pervious-C-Med-Confined	2	0.000000	0.010000	300.000000
6859	12322	Dev_Pervious-C-Med-Unconfined	2	0.000000	0.060000	300.000000
6859	12411	Dev_Pervious-D-Low-Confined	2	0.000000	0.010000	400.000000
6859	12412	Dev_Pervious-D-Low-Unconfined	2	49.372158	0.010000	400.000000
6859	12421	Dev_Pervious-D-Med-Confined	2	0.000000	0.010000	300.000000
6859	12422	Dev_Pervious-D-Med-Unconfined	2	0.000000	0.010000	300.000000
6859	13111	Agriculture-A-Low-Confined	2	0.000000	0.010000	400.000000
6859	13112	Agriculture-A-Low-Unconfined	2	0.000000	0.010000	400.000000
6859	13121	Agriculture-A-Med-Confined	2	0.000000	0.010000	300.000000
6859	13122	Agriculture-A-Med-Unconfined	2	0.000000	0.010000	300.000000
6859	13211	Agriculture-B-Low-Confined	2	0.000000	0.010000	400.000000
6859	13212	Agriculture-B-Low-Unconfined	2	0.000000	0.010000	400.000000
6859	13221	Agriculture-B-Med-Confined	2	0.000000	0.010000	300.000000
6859	13222	Agriculture-B-Med-Unconfined	2	0.000000	0.010000	300.000000
6859	13231	Agriculture-B-High-Confined	2	0.000000	0.010000	400.000000
6859	13232	Agriculture-B-High-Unconfined	2	0.000000	0.010000	400.000000
6859	13311	Agriculture-C-Low-Confined	2	0.000000	0.010000	400.000000
6859	13312	Agriculture-C-Low-Unconfined	2	0.000000	0.010000	400.000000
6859	13321	Agriculture-C-Med-Confined	2	0.000000	0.010000	300.000000
6859	13322	Agriculture-C-Med-Unconfined	2	0.000000	0.010000	300.000000
6859	13331	Agriculture-C-High-Confined	2	0.000000	0.010000	400.000000
6859	13411	Agriculture-D-Low-Confined	2	0.000000	0.010000	400.000000
6859	13412	Agriculture-D-Low-Unconfined	2	0.000000	0.010000	400.000000
6859	13421	Agriculture-D-Med-Confined	2	0.000000	0.010000	300.000000
6859	13422	Agriculture-D-Med-Unconfined	2	0.000000	0.010000	300.000000
6859	13431	Agriculture-D-High-Confined	2	0.000000	0.010000	400.000000
6859	13432	Agriculture-D-High-Unconfined	2	0.000000	0.010000	400.000000
6859	14121	Veg_Low-A-Med-Confined	2	0.000000	0.010000	300.000000
6859	14122	Veg_Low-A-Med-Unconfined	2	0.000000	0.010000	300.000000
6859	14131	Veg_Low-A-High-Confined	2	0.000000	0.010000	400.000000
6859	14132	Veg_Low-A-High-Unconfined	2	0.000000	0.010000	400.000000
6859	14221	Veg_Low-B-Med-Confined	2	0.000000	0.010000	300.000000
6859	14222	Veg_Low-B-Med-Unconfined	2	0.000000	0.080000	300.000000
6859	14231	Veg_Low-B-High-Confined	2	0.000000	0.010000	400.000000
6859	14232	Veg_Low-B-High-Unconfined	2	0.000000	0.010000	400.000000
6859	14321	Veg_Low-C-Med-Confined	2	0.000000	0.010000	300.000000
6859	14322	Veg_Low-C-Med-Unconfined	2	0.000000	0.010000	300.000000
6859	14331	Veg_Low-C-High-Confined	2	0.000000	0.010000	400.000000
6859	14332	Veg_Low-C-High-Unconfined	2	0.000000	0.010000	400.000000
6859	14421	Veg_Low-D-Med-Confined	2	0.000000	0.010000	300.000000
6859	14422	Veg_Low-D-Med-Unconfined	2	34.984324	0.010000	300.000000
6859	14431	Veg_Low-D-High-Confined	2	0.000000	0.010000	400.000000
6859	14432	Veg_Low-D-High-Unconfined	2	0.000000	0.010000	400.000000
6859	15121	Veg_High-A-Med-Confined	2	0.000000	0.010000	300.000000
6859	15122	Veg_High-A-Med-Unconfined	2	0.000000	0.010000	300.000000
6859	15131	Veg_High-A-High-Confined	2	0.000000	0.010000	400.000000
6859	15132	Veg_High-A-High-Unconfined	2	0.000000	0.010000	400.000000
6859	15221	Veg_High-B-Med-Confined	2	0.000000	0.010000	300.000000
6859	15222	Veg_High-B-Med-Unconfined	2	0.000000	0.110000	300.000000
6859	15231	Veg_High-B-High-Confined	2	0.000000	0.010000	400.000000
6859	15232	Veg_High-B-High-Unconfined	2	0.000000	0.010000	400.000000
```

| | | | | | | |
|---|---|---|---|---|---|---|
| 6859 | 15321 | Veg_High-C-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6859 | 15322 | Veg_High-C-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6859 | 15331 | Veg_High-C-High-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6859 | 15332 | Veg_High-C-High-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6859 | 15421 | Veg_High-D-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6859 | 15422 | Veg_High-D-Med-Unconfined | 2 | 132.181212 | 0.010000 | 300.000000 |
| 6859 | 15431 | Veg_High-D-High-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6859 | 15432 | Veg_High-D-High-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6859 | 16000 | Water-All-All-All | 1 | 0.000000 | 0.010000 | 100.000000 |
| 6861 | 1000 | Road_Freeway-All-All-All | 1 | 0.000000 | 0.010000 | 100.000000 |
| 6861 | 2000 | Road_Primary-All-All-All | 1 | 14.875887 | 0.010000 | 100.000000 |
| 6861 | 3000 | Road_Minor-All-All-All | 1 | 26.057185 | 0.010000 | 100.000000 |
| 6861 | 4000 | Dev_ResHigh-All-All-All | 1 | 9.043504 | 0.010000 | 100.000000 |
| 6861 | 5000 | Dev_ResLow-All-All-All | 1 | 24.717777 | 0.010000 | 100.000000 |
| 6861 | 6000 | Dev_Com-All-All-All | 1 | 7.290946 | 0.010000 | 100.000000 |
| 6861 | 7000 | Dev_Ind-All-All-All | 1 | 6.006385 | 0.010000 | 100.000000 |
| 6861 | 8000 | Dev_Inst-All-All-All | 1 | 12.023423 | 0.020000 | 100.000000 |
| 6861 | 9000 | Dev_Roof-All-All-All | 1 | 91.156744 | 0.010000 | 100.000000 |
| 6861 | 10000 | Dev_Overspray-All-All-All | 1 | 1.737169 | 0.020000 | 100.000000 |
| 6861 | 11111 | Dev_Irrigated-A-Low-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6861 | 11112 | Dev_Irrigated-A-Low-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6861 | 11121 | Dev_Irrigated-A-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6861 | 11122 | Dev_Irrigated-A-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6861 | 11211 | Dev_Irrigated-B-Low-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6861 | 11212 | Dev_Irrigated-B-Low-Unconfined | 2 | 0.000000 | 0.080000 | 400.000000 |
| 6861 | 11221 | Dev_Irrigated-B-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6861 | 11222 | Dev_Irrigated-B-Med-Unconfined | 2 | 0.000000 | 0.050000 | 300.000000 |
| 6861 | 11311 | Dev_Irrigated-C-Low-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6861 | 11312 | Dev_Irrigated-C-Low-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6861 | 11321 | Dev_Irrigated-C-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6861 | 11322 | Dev_Irrigated-C-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6861 | 11411 | Dev_Irrigated-D-Low-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6861 | 11412 | Dev_Irrigated-D-Low-Unconfined | 2 | 9.107063 | 0.010000 | 400.000000 |
| 6861 | 11421 | Dev_Irrigated-D-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6861 | 11422 | Dev_Irrigated-D-Med-Unconfined | 2 | 0.001494 | 0.010000 | 300.000000 |
| 6861 | 12111 | Dev_Pervious-A-Low-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6861 | 12112 | Dev_Pervious-A-Low-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6861 | 12121 | Dev_Pervious-A-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6861 | 12122 | Dev_Pervious-A-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6861 | 12211 | Dev_Pervious-B-Low-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6861 | 12212 | Dev_Pervious-B-Low-Unconfined | 2 | 0.000000 | 0.070000 | 400.000000 |
| 6861 | 12221 | Dev_Pervious-B-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6861 | 12222 | Dev_Pervious-B-Med-Unconfined | 2 | 0.000000 | 0.050000 | 300.000000 |
| 6861 | 12311 | Dev_Pervious-C-Low-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6861 | 12312 | Dev_Pervious-C-Low-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6861 | 12321 | Dev_Pervious-C-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6861 | 12322 | Dev_Pervious-C-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6861 | 12411 | Dev_Pervious-D-Low-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6861 | 12412 | Dev_Pervious-D-Low-Unconfined | 2 | 25.548664 | 0.010000 | 400.000000 |
| 6861 | 12421 | Dev_Pervious-D-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6861 | 12422 | Dev_Pervious-D-Med-Unconfined | 2 | 0.008859 | 0.010000 | 300.000000 |
| 6861 | 13111 | Agriculture-A-Low-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6861 | 13112 | Agriculture-A-Low-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6861 | 13121 | Agriculture-A-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6861 | 13122 | Agriculture-A-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6861 | 13211 | Agriculture-B-Low-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6861 | 13212 | Agriculture-B-Low-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6861 | 13221 | Agriculture-B-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6861 | 13222 | Agriculture-B-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6861 | 13231 | Agriculture-B-High-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6861 | 13232 | Agriculture-B-High-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6861 | 13311 | Agriculture-C-Low-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6861 | 13312 | Agriculture-C-Low-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6861 | 13321 | Agriculture-C-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6861 | 13322 | Agriculture-C-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6861 | 13331 | Agriculture-C-High-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6861 | 13411 | Agriculture-D-Low-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6861 | 13412 | Agriculture-D-Low-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6861 | 13421 | Agriculture-D-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6861 | 13422 | Agriculture-D-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6861 | 13431 | Agriculture-D-High-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6861 | 13432 | Agriculture-D-High-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6861 | 14121 | Veg_Low-A-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6861 | 14122 | Veg_Low-A-Med-Unconfined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6861 | 14131 | Veg_Low-A-High-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6861 | 14132 | Veg_Low-A-High-Unconfined | 2 | 0.000000 | 0.010000 | 400.000000 |
| 6861 | 14221 | Veg_Low-B-Med-Confined | 2 | 0.000000 | 0.010000 | 300.000000 |
| 6861 | 14222 | Veg_Low-B-Med-Unconfined | 2 | 0.000000 | 0.040000 | 300.000000 |
| 6861 | 14231 | Veg_Low-B-High-Confined | 2 | 0.000000 | 0.010000 | 400.000000 |

```
       6861   14232  Veg_Low-B-High-Unconfined     2      0.000000       0.010000       400.000000
       6861   14321  Veg_Low-C-Med-Confined 2      0.000000       0.010000       300.000000
       6861   14322  Veg_Low-C-Med-Unconfined      2      0.000000       0.010000       300.000000
       6861   14331  Veg_Low-C-High-Confined       2      0.000000       0.010000       400.000000
       6861   14332  Veg_Low-C-High-Unconfined     2      0.000000       0.010000       400.000000
       6861   14421  Veg_Low-D-Med-Confined 2      0.000000       0.010000       300.000000
       6861   14422  Veg_Low-D-Med-Unconfined      2      18.002399      0.010000       300.000000
       6861   14431  Veg_Low-D-High-Confined       2      0.000000       0.010000       400.000000
       6861   14432  Veg_Low-D-High-Unconfined     2      0.000000       0.010000       400.000000
       6861   15121  Veg_High-A-Med-Confined       2      0.000000       0.010000       300.000000
       6861   15122  Veg_High-A-Med-Unconfined     2      0.000000       0.010000       300.000000
       6861   15131  Veg_High-A-High-Confined      2      0.000000       0.010000       400.000000
       6861   15132  Veg_High-A-High-Unconfined    2      0.000000       0.010000       400.000000
       6861   15221  Veg_High-B-Med-Confined       2      0.000000       0.010000       300.000000
       6861   15222  Veg_High-B-Med-Unconfined     2      0.000000       0.040000       300.000000
       6861   15231  Veg_High-B-High-Confined      2      0.000000       0.010000       400.000000
       6861   15232  Veg_High-B-High-Unconfined    2      0.000000       0.010000       400.000000
       6861   15321  Veg_High-C-Med-Confined       2      0.000000       0.010000       300.000000
       6861   15322  Veg_High-C-Med-Unconfined     2      0.000000       0.010000       300.000000
       6861   15331  Veg_High-C-High-Confined      2      0.000000       0.010000       400.000000
       6861   15332  Veg_High-C-High-Unconfined    2      0.000000       0.010000       400.000000
       6861   15421  Veg_High-D-Med-Confined       2      0.000000       0.010000       300.000000
       6861   15422  Veg_High-D-Med-Unconfined     2      62.919092      0.010000       300.000000
       6861   15431  Veg_High-D-High-Confined      2      0.000000       0.010000       400.000000
       6861   15432  Veg_High-D-High-Unconfined    2      0.000000       0.010000       400.000000
       6861   16000  Water-All-All-All     1      0.000000       0.010000       100.000000
c-------------------------------------------------------------------------------------------
c92  SNOW-FLAGS
c
c defid     parameter group id
c deluid    landuse id
c iceflag   0 = Ice formation in the snow pack is not simulated
c           1 = Ice formation is simulated
c forest    0.0 - 1.0  Fraction of LAND covered by Forest (winter transpiration)
c fzg       parameter that adjusts for the effect of ice (in the snow pack) on infiltration when iceflag is 1
(/in.)
c fzgl      lower limit of inffac as adjusted by ice in the snow pack when iceflag is 1
c
c defid  deluid  iceflag  forest  fzg  fzgl
c--------------------------------------------------------------------------------------------
c93  snow-parm
c
c defid    parameter group id
c deluid   landuse id
c lat      latitude of the pervious land segment (PLS) - ENERGY BALANCE METHOD ONLY (degree)
c          positive for the northern hemisphere, negative for southern
c melev    mean elevation of LAND above sea level - ENERGY BALANCE METHOD ONLY (ft)
c shade    fraction of LAND shaded from solar radiation (i.e. by trees) - ENERGY BALANCE METHOD ONLY
c snowcf   precipitation-to-snow multiplier (accounts for poor gage-catch efficiency during snow)
c covind   maximum snowpack (water equivalent) at which the entire LAND is covered with snow (in)
c
c defid   deluid   lat   melev   shade   snowcf   covind
c--------------------------------------------------------------------------------------------
c94  snow-parm2
c
c defid    parameter group id
c deluid   landuse id
c rdcsn    density of cold, new snow relative to water (For snow falling at temps below freezing.
c          at higher temperatures the density of snow is adjusted)
c tsnow    air temperature below which precipitation will be snow, under saturated conditions (deg F)
c          under non-saturated conditions the temperature is adjusted slightly.
c snoevp   adapts sublimation equation to field conditions - ENERGY BALANCE METHOD ONLY
c ccfact   adapts snow condensation/convection melt equation to field conditions - ENERGY BALANCE METHOD ONLY
c mwater   maximum water content of the snow pack, in depth of water per depth of water.
c mgmelt   maximum rate of snowmelt by ground heat, in depth of water per day (in/day)
c          this is the value which applies when the pack temperature is at the freezing point.
c
c defid   deluid   rdcsn     tsnow   snoevp    ccfact    mwater    mgmelt
c--------------------------------------------------------------------------------------------
c96  snow-init
c
c   defid       parameter group id
c   deluid      landuse id
c   pack-snow   initial quantity of snow in the pack (water equivalent).
c   pack-ice    initial quantity of ice in the pack (water equivalent).
c   pack-watr   initial quantity of liquid water in the pack.
c   rdenpf      density of the frozen contents (snow and ice) of the pack, relative to water.
c   dull        index of the dullness of the snow pack surface, from which albedo is estimated - ENERGY BALANCE
METHOD ONLY
```

```
c   paktmp      mean temperature of the frozen contents of the snow pack.
c   covinx      current snow pack depth (water equivalent) required to obtain complete areal coverage of LAND.
c               if the pack is less than this amount, areal coverage is prorated (PACKF/COVINX).
c   xlnmlt      current remaining possible increment to ice storage in the pack.
c               relevant when Ice formation is simulated (iceflag = 1)
c   skyclr      fraction of sky which is assumed to be clear at the present time.
c
c defid   deluid   pack-snow   pack-ice   pack-watr   rdenpf   dull   paktmp   covinx   xlnmlt   skyclr
c--------------------------------------------------------------------------------------------
c100 pwat-parm1
c    pervious and impervious land hydrology control
c
c    (value of 0 = use constant pwat-parm4; 1 = use corresponding monthly variable card)
c
c    vcsfg    interception storage capacity     (card 150)
c    vuzfg    upper zone nominal storage      (card 160)
c    vnnfg    manning's n for the overland flow plane  (card 170)
c    vifwfg   interflow inflow parameter      (card 180)
c    vircfg   interflow recession constant     (card 190)
c    vlefg    lower zone evapotranspiration (e-t) parameter (card 200)
c
c vcsfg  vuzfg  vnnfg  vifwfg  vircfg  vlefg
       0      0      0      0      0      0
c-----------------------------------------------------------------------------------------
c110 pwat-parm2
c
c    defid   parameter group id
c    deluid  landuse id
c    lzsn    lower zone nominal soil moisture storage (inches)
c    infilt  infiltration capacity of the soil (in/hr)
c    kvary   variable groundwater recession (1/inches)
c    agwrc   base groundwater recession (none)
c
c defid deluid lzsn      infilt      kvary      agwrc
       33      1000   0.000000       0.000000       0.000000       0.000000
       33      2000   0.000000       0.000000       0.000000       0.000000
       33      3000   0.000000       0.000000       0.000000       0.000000
       33      4000   0.000000       0.000000       0.000000       0.000000
       33      5000   0.000000       0.000000       0.000000       0.000000
       33      6000   0.000000       0.000000       0.000000       0.000000
       33      7000   0.000000       0.000000       0.000000       0.000000
       33      8000   0.000000       0.000000       0.000000       0.000000
       33      9000   0.000000       0.000000       0.000000       0.000000
       33      10000  0.000000       0.000000       0.000000       0.000000
       33      11111  7.000000       0.400000       0.000000       0.920000
       33      11112  7.000000       0.400000       0.000000       0.920000
       33      11121  7.000000       0.400000       0.000000       0.920000
       33      11122  7.000000       0.400000       0.000000       0.920000
       33      11211  7.000000       0.200000       0.000000       0.920000
       33      11212  7.000000       0.200000       0.000000       0.920000
       33      11221  7.000000       0.200000       0.000000       0.920000
       33      11222  7.000000       0.200000       0.000000       0.920000
       33      11311  7.000000       0.080000       0.000000       0.920000
       33      11312  7.000000       0.080000       0.000000       0.920000
       33      11321  7.000000       0.080000       0.000000       0.920000
       33      11322  7.000000       0.080000       0.000000       0.920000
       33      11411  7.000000       0.040000       0.000000       0.920000
       33      11412  7.000000       0.040000       0.000000       0.920000
       33      11421  7.000000       0.040000       0.000000       0.920000
       33      11422  7.000000       0.040000       0.000000       0.920000
       33      12111  7.000000       0.400000       0.000000       0.920000
       33      12112  7.000000       0.400000       0.000000       0.920000
       33      12121  7.000000       0.400000       0.000000       0.920000
       33      12122  7.000000       0.400000       0.000000       0.920000
       33      12211  7.000000       0.200000       0.000000       0.920000
       33      12212  7.000000       0.200000       0.000000       0.920000
       33      12221  7.000000       0.200000       0.000000       0.920000
       33      12222  7.000000       0.200000       0.000000       0.920000
       33      12311  7.000000       0.080000       0.000000       0.920000
       33      12312  7.000000       0.080000       0.000000       0.920000
       33      12321  7.000000       0.080000       0.000000       0.920000
       33      12322  7.000000       0.080000       0.000000       0.920000
       33      12411  7.000000       0.040000       0.000000       0.920000
       33      12412  7.000000       0.040000       0.000000       0.920000
       33      12421  7.000000       0.040000       0.000000       0.920000
       33      12422  7.000000       0.040000       0.000000       0.920000
       33      13111  7.000000       0.800000       0.000000       0.920000
       33      13112  7.000000       0.800000       0.000000       0.920000
       33      13121  7.000000       0.800000       0.000000       0.920000
```

| | | | | | |
|---|---|---|---|---|---|
| 33 | 13122 | 7.000000 | 0.800000 | 0.000000 | 0.920000 |
| 33 | 13211 | 7.000000 | 0.400000 | 0.000000 | 0.920000 |
| 33 | 13212 | 7.000000 | 0.400000 | 0.000000 | 0.920000 |
| 33 | 13221 | 7.000000 | 0.400000 | 0.000000 | 0.920000 |
| 33 | 13222 | 7.000000 | 0.400000 | 0.000000 | 0.920000 |
| 33 | 13231 | 7.000000 | 0.400000 | 0.000000 | 0.920000 |
| 33 | 13232 | 7.000000 | 0.400000 | 0.000000 | 0.920000 |
| 33 | 13311 | 7.000000 | 0.200000 | 0.000000 | 0.920000 |
| 33 | 13312 | 7.000000 | 0.200000 | 0.000000 | 0.920000 |
| 33 | 13321 | 7.000000 | 0.200000 | 0.000000 | 0.920000 |
| 33 | 13322 | 7.000000 | 0.200000 | 0.000000 | 0.920000 |
| 33 | 13331 | 7.000000 | 0.200000 | 0.000000 | 0.920000 |
| 33 | 13411 | 7.000000 | 0.100000 | 0.000000 | 0.920000 |
| 33 | 13412 | 7.000000 | 0.100000 | 0.000000 | 0.920000 |
| 33 | 13421 | 7.000000 | 0.100000 | 0.000000 | 0.920000 |
| 33 | 13422 | 7.000000 | 0.100000 | 0.000000 | 0.920000 |
| 33 | 13431 | 7.000000 | 0.100000 | 0.000000 | 0.920000 |
| 33 | 13432 | 7.000000 | 0.100000 | 0.000000 | 0.920000 |
| 33 | 14121 | 8.500000 | 0.600000 | 0.000000 | 0.980000 |
| 33 | 14122 | 8.500000 | 0.600000 | 0.000000 | 0.980000 |
| 33 | 14131 | 8.500000 | 0.600000 | 0.000000 | 0.980000 |
| 33 | 14132 | 8.500000 | 0.600000 | 0.000000 | 0.980000 |
| 33 | 14221 | 8.500000 | 0.300000 | 0.000000 | 0.980000 |
| 33 | 14222 | 8.500000 | 0.300000 | 0.000000 | 0.980000 |
| 33 | 14231 | 8.500000 | 0.300000 | 0.000000 | 0.980000 |
| 33 | 14232 | 8.500000 | 0.300000 | 0.000000 | 0.980000 |
| 33 | 14321 | 8.500000 | 0.120000 | 0.000000 | 0.980000 |
| 33 | 14322 | 8.500000 | 0.120000 | 0.000000 | 0.980000 |
| 33 | 14331 | 8.500000 | 0.120000 | 0.000000 | 0.980000 |
| 33 | 14332 | 8.500000 | 0.120000 | 0.000000 | 0.980000 |
| 33 | 14421 | 8.500000 | 0.040000 | 0.000000 | 0.980000 |
| 33 | 14422 | 8.500000 | 0.040000 | 0.000000 | 0.980000 |
| 33 | 14431 | 8.500000 | 0.040000 | 0.000000 | 0.980000 |
| 33 | 14432 | 8.500000 | 0.040000 | 0.000000 | 0.980000 |
| 33 | 15121 | 8.500000 | 0.600000 | 0.000000 | 0.980000 |
| 33 | 15122 | 8.500000 | 0.600000 | 0.000000 | 0.980000 |
| 33 | 15131 | 8.500000 | 0.600000 | 0.000000 | 0.980000 |
| 33 | 15132 | 8.500000 | 0.600000 | 0.000000 | 0.980000 |
| 33 | 15221 | 8.500000 | 0.300000 | 0.000000 | 0.980000 |
| 33 | 15222 | 8.500000 | 0.300000 | 0.000000 | 0.980000 |
| 33 | 15231 | 8.500000 | 0.300000 | 0.000000 | 0.980000 |
| 33 | 15232 | 8.500000 | 0.300000 | 0.000000 | 0.980000 |
| 33 | 15321 | 8.500000 | 0.120000 | 0.000000 | 0.980000 |
| 33 | 15322 | 8.500000 | 0.120000 | 0.000000 | 0.980000 |
| 33 | 15331 | 8.500000 | 0.120000 | 0.000000 | 0.980000 |
| 33 | 15332 | 8.500000 | 0.120000 | 0.000000 | 0.980000 |
| 33 | 15421 | 8.500000 | 0.040000 | 0.000000 | 0.980000 |
| 33 | 15422 | 8.500000 | 0.040000 | 0.000000 | 0.980000 |
| 33 | 15431 | 8.500000 | 0.040000 | 0.000000 | 0.980000 |
| 33 | 15432 | 8.500000 | 0.040000 | 0.000000 | 0.980000 |
| 33 | 16000 | 0.000000 | 0.000000 | 0.000000 | 0.000000 |
| 40 | 1000 | 0.000000 | 0.000000 | 0.000000 | 0.000000 |
| 40 | 2000 | 0.000000 | 0.000000 | 0.000000 | 0.000000 |
| 40 | 3000 | 0.000000 | 0.000000 | 0.000000 | 0.000000 |
| 40 | 4000 | 0.000000 | 0.000000 | 0.000000 | 0.000000 |
| 40 | 5000 | 0.000000 | 0.000000 | 0.000000 | 0.000000 |
| 40 | 6000 | 0.000000 | 0.000000 | 0.000000 | 0.000000 |
| 40 | 7000 | 0.000000 | 0.000000 | 0.000000 | 0.000000 |
| 40 | 8000 | 0.000000 | 0.000000 | 0.000000 | 0.000000 |
| 40 | 9000 | 0.000000 | 0.000000 | 0.000000 | 0.000000 |
| 40 | 10000 | 0.000000 | 0.000000 | 0.000000 | 0.000000 |
| 40 | 11111 | 7.000000 | 0.400000 | 0.000000 | 0.920000 |
| 40 | 11112 | 7.000000 | 0.400000 | 0.000000 | 0.920000 |
| 40 | 11121 | 7.000000 | 0.400000 | 0.000000 | 0.920000 |
| 40 | 11122 | 7.000000 | 0.400000 | 0.000000 | 0.920000 |
| 40 | 11211 | 7.000000 | 0.200000 | 0.000000 | 0.920000 |
| 40 | 11212 | 7.000000 | 0.200000 | 0.000000 | 0.920000 |
| 40 | 11221 | 7.000000 | 0.200000 | 0.000000 | 0.920000 |
| 40 | 11222 | 7.000000 | 0.200000 | 0.000000 | 0.920000 |
| 40 | 11311 | 7.000000 | 0.080000 | 0.000000 | 0.920000 |
| 40 | 11312 | 7.000000 | 0.080000 | 0.000000 | 0.920000 |
| 40 | 11321 | 7.000000 | 0.080000 | 0.000000 | 0.920000 |
| 40 | 11322 | 7.000000 | 0.080000 | 0.000000 | 0.920000 |
| 40 | 11411 | 7.000000 | 0.040000 | 0.000000 | 0.920000 |
| 40 | 11412 | 7.000000 | 0.040000 | 0.000000 | 0.920000 |
| 40 | 11421 | 7.000000 | 0.040000 | 0.000000 | 0.920000 |
| 40 | 11422 | 7.000000 | 0.040000 | 0.000000 | 0.920000 |
| 40 | 12111 | 7.000000 | 0.400000 | 0.000000 | 0.920000 |
| 40 | 12112 | 7.000000 | 0.400000 | 0.000000 | 0.920000 |

```
        40     12121  7.000000       0.400000       0.000000       0.920000
        40     12122  7.000000       0.400000       0.000000       0.920000
        40     12211  7.000000       0.200000       0.000000       0.920000
        40     12212  7.000000       0.200000       0.000000       0.920000
        40     12221  7.000000       0.200000       0.000000       0.920000
        40     12222  7.000000       0.200000       0.000000       0.920000
        40     12311  7.000000       0.080000       0.000000       0.920000
        40     12312  7.000000       0.080000       0.000000       0.920000
        40     12321  7.000000       0.080000       0.000000       0.920000
        40     12322  7.000000       0.080000       0.000000       0.920000
        40     12411  7.000000       0.040000       0.000000       0.920000
        40     12412  7.000000       0.040000       0.000000       0.920000
        40     12421  7.000000       0.040000       0.000000       0.920000
        40     12422  7.000000       0.040000       0.000000       0.920000
        40     13111  7.000000       0.800000       0.000000       0.920000
        40     13112  7.000000       0.800000       0.000000       0.920000
        40     13121  7.000000       0.800000       0.000000       0.920000
        40     13122  7.000000       0.800000       0.000000       0.920000
        40     13211  7.000000       0.400000       0.000000       0.920000
        40     13212  7.000000       0.400000       0.000000       0.920000
        40     13221  7.000000       0.400000       0.000000       0.920000
        40     13222  7.000000       0.400000       0.000000       0.920000
        40     13231  7.000000       0.400000       0.000000       0.920000
        40     13232  7.000000       0.400000       0.000000       0.920000
        40     13311  7.000000       0.200000       0.000000       0.920000
        40     13312  7.000000       0.200000       0.000000       0.920000
        40     13321  7.000000       0.200000       0.000000       0.920000
        40     13322  7.000000       0.200000       0.000000       0.920000
        40     13331  7.000000       0.200000       0.000000       0.920000
        40     13411  7.000000       0.100000       0.000000       0.920000
        40     13412  7.000000       0.100000       0.000000       0.920000
        40     13421  7.000000       0.100000       0.000000       0.920000
        40     13422  7.000000       0.100000       0.000000       0.920000
        40     13431  7.000000       0.100000       0.000000       0.920000
        40     13432  7.000000       0.100000       0.000000       0.920000
        40     14121  8.500000       0.600000       0.000000       0.980000
        40     14122  8.500000       0.600000       0.000000       0.980000
        40     14131  8.500000       0.600000       0.000000       0.980000
        40     14132  8.500000       0.600000       0.000000       0.980000
        40     14221  8.500000       0.300000       0.000000       0.980000
        40     14222  8.500000       0.300000       0.000000       0.980000
        40     14231  8.500000       0.300000       0.000000       0.980000
        40     14232  8.500000       0.300000       0.000000       0.980000
        40     14321  8.500000       0.120000       0.000000       0.980000
        40     14322  8.500000       0.120000       0.000000       0.980000
        40     14331  8.500000       0.120000       0.000000       0.980000
        40     14332  8.500000       0.120000       0.000000       0.980000
        40     14421  8.500000       0.040000       0.000000       0.980000
        40     14422  8.500000       0.040000       0.000000       0.980000
        40     14431  8.500000       0.040000       0.000000       0.980000
        40     14432  8.500000       0.040000       0.000000       0.980000
        40     15121  8.500000       0.600000       0.000000       0.980000
        40     15122  8.500000       0.600000       0.000000       0.980000
        40     15131  8.500000       0.600000       0.000000       0.980000
        40     15132  8.500000       0.600000       0.000000       0.980000
        40     15221  8.500000       0.300000       0.000000       0.980000
        40     15222  8.500000       0.300000       0.000000       0.980000
        40     15231  8.500000       0.300000       0.000000       0.980000
        40     15232  8.500000       0.300000       0.000000       0.980000
        40     15321  8.500000       0.120000       0.000000       0.980000
        40     15322  8.500000       0.120000       0.000000       0.980000
        40     15331  8.500000       0.120000       0.000000       0.980000
        40     15332  8.500000       0.120000       0.000000       0.980000
        40     15421  8.500000       0.040000       0.000000       0.980000
        40     15422  8.500000       0.040000       0.000000       0.980000
        40     15431  8.500000       0.040000       0.000000       0.980000
        40     15432  8.500000       0.040000       0.000000       0.980000
        40     16000  0.000000       0.000000       0.000000       0.000000
c-----------------------------------------------------------------------------------------
c120 pwat-parm3
c
c    defid   parameter group id
c    deluid  landuse id
c    petmax  air temperature below which e-t will is reduced (deg F)
c    petmin  air temperature below which e-t is set to zero (deg F)
c    infexp  exponent in the infiltration equation (none)
c    infild  ratio between the maximum and mean infiltration capacities over the PLS (none)
c    deepfr  fraction of groundwater inflow that will enter deep groundwater (none)
c    basetp  fraction of remaining potential e-t that can be satisfied from baseflow (none)
```

```
c    agwetp  fraction of remaining potential e-t that can be satisfied from active groundwater (none)
c
c defid deluid   petmax     petmin     infexp     infild     deepfr     basetp     agwetp
       33      1000    45.000000      35.000000      0.000000       0.000000       0.000000       0.000000
       0.000000
       33      2000    45.000000      35.000000      0.000000       0.000000       0.000000       0.000000
       0.000000
       33      3000    45.000000      35.000000      0.000000       0.000000       0.000000       0.000000
       0.000000
       33      4000    45.000000      35.000000      0.000000       0.000000       0.000000       0.000000
       0.000000
       33      5000    45.000000      35.000000      0.000000       0.000000       0.000000       0.000000
       0.000000
       33      6000    45.000000      35.000000      0.000000       0.000000       0.000000       0.000000
       0.000000
       33      7000    45.000000      35.000000      0.000000       0.000000       0.000000       0.000000
       0.000000
       33      8000    45.000000      35.000000      0.000000       0.000000       0.000000       0.000000
       0.000000
       33      9000    45.000000      35.000000      0.000000       0.000000       0.000000       0.000000
       0.000000
       33      10000   45.000000      35.000000      0.000000       0.000000       0.000000       0.000000
       0.000000
       33      11111   45.000000      35.000000      2.000000       2.000000       0.000000       0.000000
       0.000000
       33      11112   45.000000      35.000000      2.000000       2.000000       0.300000       0.000000
       0.000000
       33      11121   45.000000      35.000000      2.000000       2.000000       0.000000       0.000000
       0.000000
       33      11122   45.000000      35.000000      2.000000       2.000000       0.300000       0.000000
       0.000000
       33      11211   45.000000      35.000000      2.000000       2.000000       0.000000       0.000000
       0.000000
       33      11212   45.000000      35.000000      2.000000       2.000000       0.300000       0.000000
       0.000000
       33      11221   45.000000      35.000000      2.000000       2.000000       0.000000       0.000000
       0.000000
       33      11222   45.000000      35.000000      2.000000       2.000000       0.300000       0.000000
       0.000000
       33      11311   45.000000      35.000000      2.000000       2.000000       0.000000       0.000000
       0.000000
       33      11312   45.000000      35.000000      2.000000       2.000000       0.300000       0.000000
       0.000000
       33      11321   45.000000      35.000000      2.000000       2.000000       0.000000       0.000000
       0.000000
       33      11322   45.000000      35.000000      2.000000       2.000000       0.300000       0.000000
       0.000000
       33      11411   45.000000      35.000000      2.000000       2.000000       0.000000       0.000000
       0.000000
       33      11412   45.000000      35.000000      2.000000       2.000000       0.300000       0.000000
       0.000000
       33      11421   45.000000      35.000000      2.000000       2.000000       0.000000       0.000000
       0.000000
       33      11422   45.000000      35.000000      2.000000       2.000000       0.300000       0.000000
       0.000000
       33      12111   45.000000      35.000000      2.000000       2.000000       0.000000       0.000000
       0.000000
       33      12112   45.000000      35.000000      2.000000       2.000000       0.300000       0.000000
       0.000000
       33      12121   45.000000      35.000000      2.000000       2.000000       0.000000       0.000000
       0.000000
       33      12122   45.000000      35.000000      2.000000       2.000000       0.300000       0.000000
       0.000000
       33      12211   45.000000      35.000000      2.000000       2.000000       0.000000       0.000000
       0.000000
       33      12212   45.000000      35.000000      2.000000       2.000000       0.300000       0.000000
       0.000000
       33      12221   45.000000      35.000000      2.000000       2.000000       0.000000       0.000000
       0.000000
       33      12222   45.000000      35.000000      2.000000       2.000000       0.300000       0.000000
       0.000000
       33      12311   45.000000      35.000000      2.000000       2.000000       0.000000       0.000000
       0.000000
       33      12312   45.000000      35.000000      2.000000       2.000000       0.300000       0.000000
       0.000000
       33      12321   45.000000      35.000000      2.000000       2.000000       0.000000       0.000000
       0.000000
       33      12322   45.000000      35.000000      2.000000       2.000000       0.300000       0.000000
       0.000000
```

```
33      12411   45.000000       35.000000       2.000000        2.000000        0.000000        0.000000
0.000000
33      12412   45.000000       35.000000       2.000000        2.000000        0.300000        0.000000
0.000000
33      12421   45.000000       35.000000       2.000000        2.000000        0.000000        0.000000
0.000000
33      12422   45.000000       35.000000       2.000000        2.000000        0.300000        0.000000
0.000000
33      13111   45.000000       35.000000       2.000000        2.000000        0.000000        0.000000
0.000000
33      13112   45.000000       35.000000       2.000000        2.000000        0.300000        0.000000
0.000000
33      13121   45.000000       35.000000       2.000000        2.000000        0.000000        0.000000
0.000000
33      13122   45.000000       35.000000       2.000000        2.000000        0.300000        0.000000
0.000000
33      13211   45.000000       35.000000       2.000000        2.000000        0.000000        0.000000
0.000000
33      13212   45.000000       35.000000       2.000000        2.000000        0.300000        0.000000
0.000000
33      13221   45.000000       35.000000       2.000000        2.000000        0.000000        0.000000
0.000000
33      13222   45.000000       35.000000       2.000000        2.000000        0.300000        0.000000
0.000000
33      13231   45.000000       35.000000       2.000000        2.000000        0.000000        0.000000
0.000000
33      13232   45.000000       35.000000       2.000000        2.000000        0.300000        0.000000
0.000000
33      13311   45.000000       35.000000       2.000000        2.000000        0.000000        0.000000
0.000000
33      13312   45.000000       35.000000       2.000000        2.000000        0.300000        0.000000
0.000000
33      13321   45.000000       35.000000       2.000000        2.000000        0.000000        0.000000
0.000000
33      13322   45.000000       35.000000       2.000000        2.000000        0.300000        0.000000
0.000000
33      13331   45.000000       35.000000       2.000000        2.000000        0.000000        0.000000
0.000000
33      13411   45.000000       35.000000       2.000000        2.000000        0.000000        0.000000
0.000000
33      13412   45.000000       35.000000       2.000000        2.000000        0.300000        0.000000
0.000000
33      13421   45.000000       35.000000       2.000000        2.000000        0.000000        0.000000
0.000000
33      13422   45.000000       35.000000       2.000000        2.000000        0.300000        0.000000
0.000000
33      13431   45.000000       35.000000       2.000000        2.000000        0.000000        0.000000
0.000000
33      13432   45.000000       35.000000       2.000000        2.000000        0.300000        0.000000
0.000000
33      14121   45.000000       35.000000       2.000000        2.000000        0.000000        0.010000
0.030000
33      14122   45.000000       35.000000       2.000000        2.000000        0.300000        0.010000
0.030000
33      14131   45.000000       35.000000       2.000000        2.000000        0.000000        0.010000
0.030000
33      14132   45.000000       35.000000       2.000000        2.000000        0.300000        0.010000
0.030000
33      14221   45.000000       35.000000       2.000000        2.000000        0.000000        0.010000
0.030000
33      14222   45.000000       35.000000       2.000000        2.000000        0.300000        0.010000
0.030000
33      14231   45.000000       35.000000       2.000000        2.000000        0.000000        0.010000
0.030000
33      14232   45.000000       35.000000       2.000000        2.000000        0.300000        0.010000
0.030000
33      14321   45.000000       35.000000       2.000000        2.000000        0.000000        0.010000
0.030000
33      14322   45.000000       35.000000       2.000000        2.000000        0.300000        0.010000
0.030000
33      14331   45.000000       35.000000       2.000000        2.000000        0.000000        0.010000
0.030000
33      14332   45.000000       35.000000       2.000000        2.000000        0.300000        0.010000
0.030000
33      14421   45.000000       35.000000       2.000000        2.000000        0.000000        0.010000
0.030000
33      14422   45.000000       35.000000       2.000000        2.000000        0.300000        0.010000
0.030000
```

```
33      14431   45.000000       35.000000       2.000000        2.000000        0.000000        0.010000
0.030000
33      14432   45.000000       35.000000       2.000000        2.000000        0.300000        0.010000
0.030000
33      15121   45.000000       35.000000       2.000000        2.000000        0.000000        0.010000
0.030000
33      15122   45.000000       35.000000       2.000000        2.000000        0.300000        0.010000
0.030000
33      15131   45.000000       35.000000       2.000000        2.000000        0.000000        0.010000
0.030000
33      15132   45.000000       35.000000       2.000000        2.000000        0.300000        0.010000
0.030000
33      15221   45.000000       35.000000       2.000000        2.000000        0.000000        0.010000
0.030000
33      15222   45.000000       35.000000       2.000000        2.000000        0.300000        0.010000
0.030000
33      15231   45.000000       35.000000       2.000000        2.000000        0.000000        0.010000
0.030000
33      15232   45.000000       35.000000       2.000000        2.000000        0.300000        0.010000
0.030000
33      15321   45.000000       35.000000       2.000000        2.000000        0.000000        0.010000
0.030000
33      15322   45.000000       35.000000       2.000000        2.000000        0.300000        0.010000
0.030000
33      15331   45.000000       35.000000       2.000000        2.000000        0.000000        0.010000
0.030000
33      15332   45.000000       35.000000       2.000000        2.000000        0.300000        0.010000
0.030000
33      15421   45.000000       35.000000       2.000000        2.000000        0.000000        0.010000
0.030000
33      15422   45.000000       35.000000       2.000000        2.000000        0.300000        0.010000
0.030000
33      15431   45.000000       35.000000       2.000000        2.000000        0.000000        0.010000
0.030000
33      15432   45.000000       35.000000       2.000000        2.000000        0.300000        0.010000
0.030000
33      16000   45.000000       35.000000       2.000000        2.000000        0.000000        0.010000
0.030000
40      1000    45.000000       35.000000       0.000000        0.000000        0.000000        0.000000
0.000000
40      2000    45.000000       35.000000       0.000000        0.000000        0.000000        0.000000
0.000000
40      3000    45.000000       35.000000       0.000000        0.000000        0.000000        0.000000
0.000000
40      4000    45.000000       35.000000       0.000000        0.000000        0.000000        0.000000
0.000000
40      5000    45.000000       35.000000       0.000000        0.000000        0.000000        0.000000
0.000000
40      6000    45.000000       35.000000       0.000000        0.000000        0.000000        0.000000
0.000000
40      7000    45.000000       35.000000       0.000000        0.000000        0.000000        0.000000
0.000000
40      8000    45.000000       35.000000       0.000000        0.000000        0.000000        0.000000
0.000000
40      9000    45.000000       35.000000       0.000000        0.000000        0.000000        0.000000
0.000000
40      10000   45.000000       35.000000       0.000000        0.000000        0.000000        0.000000
0.000000
40      11111   45.000000       35.000000       2.000000        2.000000        0.000000        0.000000
0.000000
40      11112   45.000000       35.000000       2.000000        2.000000        0.300000        0.000000
0.000000
40      11121   45.000000       35.000000       2.000000        2.000000        0.000000        0.000000
0.000000
40      11122   45.000000       35.000000       2.000000        2.000000        0.300000        0.000000
0.000000
40      11211   45.000000       35.000000       2.000000        2.000000        0.000000        0.000000
0.000000
40      11212   45.000000       35.000000       2.000000        2.000000        0.300000        0.000000
0.000000
40      11221   45.000000       35.000000       2.000000        2.000000        0.000000        0.000000
0.000000
40      11222   45.000000       35.000000       2.000000        2.000000        0.300000        0.000000
0.000000
40      11311   45.000000       35.000000       2.000000        2.000000        0.000000        0.000000
0.000000
40      11312   45.000000       35.000000       2.000000        2.000000        0.300000        0.000000
0.000000
```

```
40      11321   45.000000       35.000000       2.000000        2.000000        0.000000        0.000000
0.000000
40      11322   45.000000       35.000000       2.000000        2.000000        0.300000        0.000000
0.000000
40      11411   45.000000       35.000000       2.000000        2.000000        0.000000        0.000000
0.000000
40      11412   45.000000       35.000000       2.000000        2.000000        0.300000        0.000000
0.000000
40      11421   45.000000       35.000000       2.000000        2.000000        0.000000        0.000000
0.000000
40      11422   45.000000       35.000000       2.000000        2.000000        0.300000        0.000000
0.000000
40      12111   45.000000       35.000000       2.000000        2.000000        0.000000        0.000000
0.000000
40      12112   45.000000       35.000000       2.000000        2.000000        0.300000        0.000000
0.000000
40      12121   45.000000       35.000000       2.000000        2.000000        0.000000        0.000000
0.000000
40      12122   45.000000       35.000000       2.000000        2.000000        0.300000        0.000000
0.000000
40      12211   45.000000       35.000000       2.000000        2.000000        0.000000        0.000000
0.000000
40      12212   45.000000       35.000000       2.000000        2.000000        0.300000        0.000000
0.000000
40      12221   45.000000       35.000000       2.000000        2.000000        0.000000        0.000000
0.000000
40      12222   45.000000       35.000000       2.000000        2.000000        0.300000        0.000000
0.000000
40      12311   45.000000       35.000000       2.000000        2.000000        0.000000        0.000000
0.000000
40      12312   45.000000       35.000000       2.000000        2.000000        0.300000        0.000000
0.000000
40      12321   45.000000       35.000000       2.000000        2.000000        0.000000        0.000000
0.000000
40      12322   45.000000       35.000000       2.000000        2.000000        0.300000        0.000000
0.000000
40      12411   45.000000       35.000000       2.000000        2.000000        0.000000        0.000000
0.000000
40      12412   45.000000       35.000000       2.000000        2.000000        0.300000        0.000000
0.000000
40      12421   45.000000       35.000000       2.000000        2.000000        0.000000        0.000000
0.000000
40      12422   45.000000       35.000000       2.000000        2.000000        0.300000        0.000000
0.000000
40      13111   45.000000       35.000000       2.000000        2.000000        0.000000        0.000000
0.000000
40      13112   45.000000       35.000000       2.000000        2.000000        0.300000        0.000000
0.000000
40      13121   45.000000       35.000000       2.000000        2.000000        0.000000        0.000000
0.000000
40      13122   45.000000       35.000000       2.000000        2.000000        0.300000        0.000000
0.000000
40      13211   45.000000       35.000000       2.000000        2.000000        0.000000        0.000000
0.000000
40      13212   45.000000       35.000000       2.000000        2.000000        0.300000        0.000000
0.000000
40      13221   45.000000       35.000000       2.000000        2.000000        0.000000        0.000000
0.000000
40      13222   45.000000       35.000000       2.000000        2.000000        0.300000        0.000000
0.000000
40      13231   45.000000       35.000000       2.000000        2.000000        0.000000        0.000000
0.000000
40      13232   45.000000       35.000000       2.000000        2.000000        0.300000        0.000000
0.000000
40      13311   45.000000       35.000000       2.000000        2.000000        0.000000        0.000000
0.000000
40      13312   45.000000       35.000000       2.000000        2.000000        0.300000        0.000000
0.000000
40      13321   45.000000       35.000000       2.000000        2.000000        0.000000        0.000000
0.000000
40      13322   45.000000       35.000000       2.000000        2.000000        0.300000        0.000000
0.000000
40      13331   45.000000       35.000000       2.000000        2.000000        0.000000        0.000000
0.000000
40      13411   45.000000       35.000000       2.000000        2.000000        0.000000        0.000000
0.000000
40      13412   45.000000       35.000000       2.000000        2.000000        0.300000        0.000000
0.000000
```

```
       40      13421   45.000000      35.000000      2.000000       2.000000       0.000000       0.000000
       0.000000
       40      13422   45.000000      35.000000      2.000000       2.000000       0.300000       0.000000
       0.000000
       40      13431   45.000000      35.000000      2.000000       2.000000       0.000000       0.000000
       0.000000
       40      13432   45.000000      35.000000      2.000000       2.000000       0.300000       0.000000
       0.000000
       40      14121   45.000000      35.000000      2.000000       2.000000       0.000000       0.010000
       0.030000
       40      14122   45.000000      35.000000      2.000000       2.000000       0.300000       0.010000
       0.030000
       40      14131   45.000000      35.000000      2.000000       2.000000       0.000000       0.010000
       0.030000
       40      14132   45.000000      35.000000      2.000000       2.000000       0.300000       0.010000
       0.030000
       40      14221   45.000000      35.000000      2.000000       2.000000       0.000000       0.010000
       0.030000
       40      14222   45.000000      35.000000      2.000000       2.000000       0.300000       0.010000
       0.030000
       40      14231   45.000000      35.000000      2.000000       2.000000       0.000000       0.010000
       0.030000
       40      14232   45.000000      35.000000      2.000000       2.000000       0.300000       0.010000
       0.030000
       40      14321   45.000000      35.000000      2.000000       2.000000       0.000000       0.010000
       0.030000
       40      14322   45.000000      35.000000      2.000000       2.000000       0.300000       0.010000
       0.030000
       40      14331   45.000000      35.000000      2.000000       2.000000       0.000000       0.010000
       0.030000
       40      14332   45.000000      35.000000      2.000000       2.000000       0.300000       0.010000
       0.030000
       40      14421   45.000000      35.000000      2.000000       2.000000       0.000000       0.010000
       0.030000
       40      14422   45.000000      35.000000      2.000000       2.000000       0.300000       0.010000
       0.030000
       40      14431   45.000000      35.000000      2.000000       2.000000       0.000000       0.010000
       0.030000
       40      14432   45.000000      35.000000      2.000000       2.000000       0.300000       0.010000
       0.030000
       40      15121   45.000000      35.000000      2.000000       2.000000       0.000000       0.010000
       0.030000
       40      15122   45.000000      35.000000      2.000000       2.000000       0.300000       0.010000
       0.030000
       40      15131   45.000000      35.000000      2.000000       2.000000       0.000000       0.010000
       0.030000
       40      15132   45.000000      35.000000      2.000000       2.000000       0.300000       0.010000
       0.030000
       40      15221   45.000000      35.000000      2.000000       2.000000       0.000000       0.010000
       0.030000
       40      15222   45.000000      35.000000      2.000000       2.000000       0.300000       0.010000
       0.030000
       40      15231   45.000000      35.000000      2.000000       2.000000       0.000000       0.010000
       0.030000
       40      15232   45.000000      35.000000      2.000000       2.000000       0.300000       0.010000
       0.030000
       40      15321   45.000000      35.000000      2.000000       2.000000       0.000000       0.010000
       0.030000
       40      15322   45.000000      35.000000      2.000000       2.000000       0.300000       0.010000
       0.030000
       40      15331   45.000000      35.000000      2.000000       2.000000       0.000000       0.010000
       0.030000
       40      15332   45.000000      35.000000      2.000000       2.000000       0.300000       0.010000
       0.030000
       40      15421   45.000000      35.000000      2.000000       2.000000       0.000000       0.010000
       0.030000
       40      15422   45.000000      35.000000      2.000000       2.000000       0.300000       0.010000
       0.030000
       40      15431   45.000000      35.000000      2.000000       2.000000       0.000000       0.010000
       0.030000
       40      15432   45.000000      35.000000      2.000000       2.000000       0.300000       0.010000
       0.030000
       40      16000   45.000000      35.000000      2.000000       2.000000       0.000000       0.010000
       0.030000
c------------------------------------------------------------------------------------------
c130 pwat-parm4
c
c    defid   parameter group id
c    deluid  landuse id
```

```
c    cepsc   interception storage capacity (inches)
c    uzsn    upper zone nominal storage (inches)
c    nsur    Manning's n for the assumed overland flow plane (none)
c    intfw   interflow inflow parameter (none)
c    irc     interflow recession parameter (none)
c    lzetp   lower zone e-t parameter (none)
c
c defid deluid   cepsc      uzsn     nsur       intfw       irc        lzetp
        33      1000   0.040000       0.000000       0.011000       0.000000       0.000000       0.000000
        33      2000   0.040000       0.000000       0.011000       0.000000       0.000000       0.000000
        33      3000   0.040000       0.000000       0.011000       0.000000       0.000000       0.000000
        33      4000   0.040000       0.000000       0.011000       0.000000       0.000000       0.000000
        33      5000   0.040000       0.000000       0.011000       0.000000       0.000000       0.000000
        33      6000   0.040000       0.000000       0.011000       0.000000       0.000000       0.000000
        33      7000   0.040000       0.000000       0.011000       0.000000       0.000000       0.000000
        33      8000   0.040000       0.000000       0.011000       0.000000       0.000000       0.000000
        33      9000   0.020000       0.000000       0.011000       0.000000       0.000000       0.000000
        33      10000  0.040000       0.000000       0.011000       0.000000       0.000000       0.000000
        33      11111  0.060000       0.700000       0.200000       0.500000       0.300000       0.200000
        33      11112  0.060000       0.700000       0.200000       0.500000       0.300000       0.200000
        33      11121  0.060000       0.560000       0.200000       0.500000       0.300000       0.200000
        33      11122  0.060000       0.560000       0.200000       0.500000       0.300000       0.200000
        33      11211  0.060000       0.700000       0.200000       0.500000       0.300000       0.200000
        33      11212  0.060000       0.700000       0.200000       0.500000       0.300000       0.200000
        33      11221  0.060000       0.560000       0.200000       0.500000       0.300000       0.200000
        33      11222  0.060000       0.560000       0.200000       0.500000       0.300000       0.200000
        33      11311  0.060000       0.700000       0.200000       0.500000       0.300000       0.200000
        33      11312  0.060000       0.700000       0.200000       0.500000       0.300000       0.200000
        33      11321  0.060000       0.560000       0.200000       0.500000       0.300000       0.200000
        33      11322  0.060000       0.560000       0.200000       0.500000       0.300000       0.200000
        33      11411  0.060000       0.700000       0.200000       0.500000       0.300000       0.200000
        33      11412  0.060000       0.700000       0.200000       0.500000       0.300000       0.200000
        33      11421  0.060000       0.560000       0.200000       0.500000       0.300000       0.200000
        33      11422  0.060000       0.560000       0.200000       0.500000       0.300000       0.200000
        33      12111  0.060000       0.700000       0.200000       0.500000       0.300000       0.200000
        33      12112  0.060000       0.700000       0.200000       0.500000       0.300000       0.200000
        33      12121  0.060000       0.560000       0.200000       0.500000       0.300000       0.200000
        33      12122  0.060000       0.560000       0.200000       0.500000       0.300000       0.200000
        33      12211  0.060000       0.700000       0.200000       0.500000       0.300000       0.200000
        33      12212  0.060000       0.700000       0.200000       0.500000       0.300000       0.200000
        33      12221  0.060000       0.560000       0.200000       0.500000       0.300000       0.200000
        33      12222  0.060000       0.560000       0.200000       0.500000       0.300000       0.200000
        33      12311  0.060000       0.700000       0.200000       0.500000       0.300000       0.200000
        33      12312  0.060000       0.700000       0.200000       0.500000       0.300000       0.200000
        33      12321  0.060000       0.560000       0.200000       0.500000       0.300000       0.200000
        33      12322  0.060000       0.560000       0.200000       0.500000       0.300000       0.200000
        33      12411  0.060000       0.700000       0.200000       0.500000       0.300000       0.200000
        33      12412  0.060000       0.700000       0.200000       0.500000       0.300000       0.200000
        33      12421  0.060000       0.560000       0.200000       0.500000       0.300000       0.200000
        33      12422  0.060000       0.560000       0.200000       0.500000       0.300000       0.200000
        33      13111  0.100000       0.700000       0.200000       1.000000       0.300000       0.500000
        33      13112  0.100000       0.700000       0.200000       1.000000       0.300000       0.500000
        33      13121  0.100000       0.560000       0.200000       1.000000       0.300000       0.500000
        33      13122  0.100000       0.560000       0.200000       1.000000       0.300000       0.500000
        33      13211  0.100000       0.700000       0.200000       1.000000       0.300000       0.500000
        33      13212  0.100000       0.700000       0.200000       1.000000       0.300000       0.500000
        33      13221  0.100000       0.560000       0.200000       1.000000       0.300000       0.500000
        33      13222  0.100000       0.560000       0.200000       1.000000       0.300000       0.500000
        33      13231  0.100000       0.420000       0.200000       1.000000       0.300000       0.500000
        33      13232  0.100000       0.420000       0.200000       1.000000       0.300000       0.500000
        33      13311  0.100000       0.700000       0.200000       1.000000       0.300000       0.500000
        33      13312  0.100000       0.700000       0.200000       1.000000       0.300000       0.500000
        33      13321  0.100000       0.560000       0.200000       1.000000       0.300000       0.500000
        33      13322  0.100000       0.560000       0.200000       1.000000       0.300000       0.500000
        33      13331  0.100000       0.420000       0.200000       1.000000       0.300000       0.500000
        33      13411  0.100000       0.700000       0.200000       1.000000       0.300000       0.500000
        33      13412  0.100000       0.700000       0.200000       1.000000       0.300000       0.500000
        33      13421  0.100000       0.560000       0.200000       1.000000       0.300000       0.500000
        33      13422  0.100000       0.560000       0.200000       1.000000       0.300000       0.500000
        33      13431  0.100000       0.420000       0.200000       1.000000       0.300000       0.500000
        33      13432  0.100000       0.420000       0.200000       1.000000       0.300000       0.500000
        33      14121  0.130000       0.850000       0.200000       1.000000       0.300000       0.700000
        33      14122  0.130000       0.850000       0.200000       1.000000       0.300000       0.700000
        33      14131  0.100000       0.680000       0.200000       1.000000       0.300000       0.700000
        33      14132  0.100000       0.680000       0.200000       1.000000       0.300000       0.700000
        33      14221  0.130000       0.850000       0.200000       1.000000       0.300000       0.700000
        33      14222  0.130000       0.850000       0.200000       1.000000       0.300000       0.700000
        33      14231  0.100000       0.680000       0.200000       1.000000       0.300000       0.700000
        33      14232  0.100000       0.680000       0.200000       1.000000       0.300000       0.700000
```

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 33 | 14321 | 0.130000 | 0.850000 | 0.200000 | 1.000000 | 0.300000 | 0.700000 |
| 33 | 14322 | 0.130000 | 0.850000 | 0.200000 | 1.000000 | 0.300000 | 0.700000 |
| 33 | 14331 | 0.100000 | 0.680000 | 0.200000 | 1.000000 | 0.300000 | 0.700000 |
| 33 | 14332 | 0.100000 | 0.680000 | 0.200000 | 1.000000 | 0.300000 | 0.700000 |
| 33 | 14421 | 0.130000 | 0.850000 | 0.200000 | 1.000000 | 0.300000 | 0.700000 |
| 33 | 14422 | 0.130000 | 0.850000 | 0.200000 | 1.000000 | 0.300000 | 0.700000 |
| 33 | 14431 | 0.100000 | 0.680000 | 0.200000 | 1.000000 | 0.300000 | 0.700000 |
| 33 | 14432 | 0.100000 | 0.680000 | 0.200000 | 1.000000 | 0.300000 | 0.700000 |
| 33 | 15121 | 0.150000 | 0.850000 | 0.250000 | 1.000000 | 0.300000 | 0.700000 |
| 33 | 15122 | 0.150000 | 0.850000 | 0.250000 | 1.000000 | 0.300000 | 0.700000 |
| 33 | 15131 | 0.130000 | 0.680000 | 0.250000 | 1.000000 | 0.300000 | 0.700000 |
| 33 | 15132 | 0.130000 | 0.680000 | 0.250000 | 1.000000 | 0.300000 | 0.700000 |
| 33 | 15221 | 0.150000 | 0.850000 | 0.250000 | 1.000000 | 0.300000 | 0.700000 |
| 33 | 15222 | 0.150000 | 0.850000 | 0.250000 | 1.000000 | 0.300000 | 0.700000 |
| 33 | 15231 | 0.130000 | 0.680000 | 0.250000 | 1.000000 | 0.300000 | 0.700000 |
| 33 | 15232 | 0.130000 | 0.680000 | 0.250000 | 1.000000 | 0.300000 | 0.700000 |
| 33 | 15321 | 0.150000 | 0.850000 | 0.250000 | 1.000000 | 0.300000 | 0.700000 |
| 33 | 15322 | 0.150000 | 0.850000 | 0.250000 | 1.000000 | 0.300000 | 0.700000 |
| 33 | 15331 | 0.130000 | 0.680000 | 0.250000 | 1.000000 | 0.300000 | 0.700000 |
| 33 | 15332 | 0.130000 | 0.680000 | 0.250000 | 1.000000 | 0.300000 | 0.700000 |
| 33 | 15421 | 0.150000 | 0.850000 | 0.250000 | 1.000000 | 0.300000 | 0.700000 |
| 33 | 15422 | 0.150000 | 0.850000 | 0.250000 | 1.000000 | 0.300000 | 0.700000 |
| 33 | 15431 | 0.130000 | 0.680000 | 0.250000 | 1.000000 | 0.300000 | 0.700000 |
| 33 | 15432 | 0.130000 | 0.680000 | 0.250000 | 1.000000 | 0.300000 | 0.700000 |
| 33 | 16000 | 0.000000 | 0.000000 | 0.000000 | 0.000000 | 0.000000 | 0.000000 |
| 40 | 1000 | 0.040000 | 0.000000 | 0.011000 | 0.000000 | 0.000000 | 0.000000 |
| 40 | 2000 | 0.040000 | 0.000000 | 0.011000 | 0.000000 | 0.000000 | 0.000000 |
| 40 | 3000 | 0.040000 | 0.000000 | 0.011000 | 0.000000 | 0.000000 | 0.000000 |
| 40 | 4000 | 0.040000 | 0.000000 | 0.011000 | 0.000000 | 0.000000 | 0.000000 |
| 40 | 5000 | 0.040000 | 0.000000 | 0.011000 | 0.000000 | 0.000000 | 0.000000 |
| 40 | 6000 | 0.040000 | 0.000000 | 0.011000 | 0.000000 | 0.000000 | 0.000000 |
| 40 | 7000 | 0.040000 | 0.000000 | 0.011000 | 0.000000 | 0.000000 | 0.000000 |
| 40 | 8000 | 0.040000 | 0.000000 | 0.011000 | 0.000000 | 0.000000 | 0.000000 |
| 40 | 9000 | 0.020000 | 0.000000 | 0.011000 | 0.000000 | 0.000000 | 0.000000 |
| 40 | 10000 | 0.040000 | 0.000000 | 0.011000 | 0.000000 | 0.000000 | 0.000000 |
| 40 | 11111 | 0.060000 | 0.700000 | 0.200000 | 0.500000 | 0.300000 | 0.200000 |
| 40 | 11112 | 0.060000 | 0.700000 | 0.200000 | 0.500000 | 0.300000 | 0.200000 |
| 40 | 11121 | 0.060000 | 0.560000 | 0.200000 | 0.500000 | 0.300000 | 0.200000 |
| 40 | 11122 | 0.060000 | 0.560000 | 0.200000 | 0.500000 | 0.300000 | 0.200000 |
| 40 | 11211 | 0.060000 | 0.700000 | 0.200000 | 0.500000 | 0.300000 | 0.200000 |
| 40 | 11212 | 0.060000 | 0.700000 | 0.200000 | 0.500000 | 0.300000 | 0.200000 |
| 40 | 11221 | 0.060000 | 0.560000 | 0.200000 | 0.500000 | 0.300000 | 0.200000 |
| 40 | 11222 | 0.060000 | 0.560000 | 0.200000 | 0.500000 | 0.300000 | 0.200000 |
| 40 | 11311 | 0.060000 | 0.700000 | 0.200000 | 0.500000 | 0.300000 | 0.200000 |
| 40 | 11312 | 0.060000 | 0.700000 | 0.200000 | 0.500000 | 0.300000 | 0.200000 |
| 40 | 11321 | 0.060000 | 0.560000 | 0.200000 | 0.500000 | 0.300000 | 0.200000 |
| 40 | 11322 | 0.060000 | 0.560000 | 0.200000 | 0.500000 | 0.300000 | 0.200000 |
| 40 | 11411 | 0.060000 | 0.700000 | 0.200000 | 0.500000 | 0.300000 | 0.200000 |
| 40 | 11412 | 0.060000 | 0.700000 | 0.200000 | 0.500000 | 0.300000 | 0.200000 |
| 40 | 11421 | 0.060000 | 0.560000 | 0.200000 | 0.500000 | 0.300000 | 0.200000 |
| 40 | 11422 | 0.060000 | 0.560000 | 0.200000 | 0.500000 | 0.300000 | 0.200000 |
| 40 | 12111 | 0.060000 | 0.700000 | 0.200000 | 0.500000 | 0.300000 | 0.200000 |
| 40 | 12112 | 0.060000 | 0.700000 | 0.200000 | 0.500000 | 0.300000 | 0.200000 |
| 40 | 12121 | 0.060000 | 0.560000 | 0.200000 | 0.500000 | 0.300000 | 0.200000 |
| 40 | 12122 | 0.060000 | 0.560000 | 0.200000 | 0.500000 | 0.300000 | 0.200000 |
| 40 | 12211 | 0.060000 | 0.700000 | 0.200000 | 0.500000 | 0.300000 | 0.200000 |
| 40 | 12212 | 0.060000 | 0.700000 | 0.200000 | 0.500000 | 0.300000 | 0.200000 |
| 40 | 12221 | 0.060000 | 0.560000 | 0.200000 | 0.500000 | 0.300000 | 0.200000 |
| 40 | 12222 | 0.060000 | 0.560000 | 0.200000 | 0.500000 | 0.300000 | 0.200000 |
| 40 | 12311 | 0.060000 | 0.700000 | 0.200000 | 0.500000 | 0.300000 | 0.200000 |
| 40 | 12312 | 0.060000 | 0.700000 | 0.200000 | 0.500000 | 0.300000 | 0.200000 |
| 40 | 12321 | 0.060000 | 0.560000 | 0.200000 | 0.500000 | 0.300000 | 0.200000 |
| 40 | 12322 | 0.060000 | 0.560000 | 0.200000 | 0.500000 | 0.300000 | 0.200000 |
| 40 | 12411 | 0.060000 | 0.700000 | 0.200000 | 0.500000 | 0.300000 | 0.200000 |
| 40 | 12412 | 0.060000 | 0.700000 | 0.200000 | 0.500000 | 0.300000 | 0.200000 |
| 40 | 12421 | 0.060000 | 0.560000 | 0.200000 | 0.500000 | 0.300000 | 0.200000 |
| 40 | 12422 | 0.060000 | 0.560000 | 0.200000 | 0.500000 | 0.300000 | 0.200000 |
| 40 | 13111 | 0.100000 | 0.700000 | 0.200000 | 1.000000 | 0.300000 | 0.500000 |
| 40 | 13112 | 0.100000 | 0.700000 | 0.200000 | 1.000000 | 0.300000 | 0.500000 |
| 40 | 13121 | 0.100000 | 0.560000 | 0.200000 | 1.000000 | 0.300000 | 0.500000 |
| 40 | 13122 | 0.100000 | 0.560000 | 0.200000 | 1.000000 | 0.300000 | 0.500000 |
| 40 | 13211 | 0.100000 | 0.700000 | 0.200000 | 1.000000 | 0.300000 | 0.500000 |
| 40 | 13212 | 0.100000 | 0.700000 | 0.200000 | 1.000000 | 0.300000 | 0.500000 |
| 40 | 13221 | 0.100000 | 0.560000 | 0.200000 | 1.000000 | 0.300000 | 0.500000 |
| 40 | 13222 | 0.100000 | 0.560000 | 0.200000 | 1.000000 | 0.300000 | 0.500000 |
| 40 | 13231 | 0.100000 | 0.420000 | 0.200000 | 1.000000 | 0.300000 | 0.500000 |
| 40 | 13232 | 0.100000 | 0.420000 | 0.200000 | 1.000000 | 0.300000 | 0.500000 |
| 40 | 13311 | 0.100000 | 0.700000 | 0.200000 | 1.000000 | 0.300000 | 0.500000 |
| 40 | 13312 | 0.100000 | 0.700000 | 0.200000 | 1.000000 | 0.300000 | 0.500000 |

```
       40      13321  0.100000       0.560000       0.200000       1.000000       0.300000       0.500000
       40      13322  0.100000       0.560000       0.200000       1.000000       0.300000       0.500000
       40      13331  0.100000       0.420000       0.200000       1.000000       0.300000       0.500000
       40      13411  0.100000       0.700000       0.200000       1.000000       0.300000       0.500000
       40      13412  0.100000       0.700000       0.200000       1.000000       0.300000       0.500000
       40      13421  0.100000       0.560000       0.200000       1.000000       0.300000       0.500000
       40      13422  0.100000       0.560000       0.200000       1.000000       0.300000       0.500000
       40      13431  0.100000       0.420000       0.200000       1.000000       0.300000       0.500000
       40      13432  0.100000       0.420000       0.200000       1.000000       0.300000       0.500000
       40      14121  0.130000       0.850000       0.200000       1.000000       0.300000       0.700000
       40      14122  0.130000       0.850000       0.200000       1.000000       0.300000       0.700000
       40      14131  0.100000       0.680000       0.200000       1.000000       0.300000       0.700000
       40      14132  0.100000       0.680000       0.200000       1.000000       0.300000       0.700000
       40      14221  0.130000       0.850000       0.200000       1.000000       0.300000       0.700000
       40      14222  0.130000       0.850000       0.200000       1.000000       0.300000       0.700000
       40      14231  0.100000       0.680000       0.200000       1.000000       0.300000       0.700000
       40      14232  0.100000       0.680000       0.200000       1.000000       0.300000       0.700000
       40      14321  0.130000       0.850000       0.200000       1.000000       0.300000       0.700000
       40      14322  0.130000       0.850000       0.200000       1.000000       0.300000       0.700000
       40      14331  0.100000       0.680000       0.200000       1.000000       0.300000       0.700000
       40      14332  0.100000       0.680000       0.200000       1.000000       0.300000       0.700000
       40      14421  0.130000       0.850000       0.200000       1.000000       0.300000       0.700000
       40      14422  0.130000       0.850000       0.200000       1.000000       0.300000       0.700000
       40      14431  0.100000       0.680000       0.200000       1.000000       0.300000       0.700000
       40      14432  0.100000       0.680000       0.200000       1.000000       0.300000       0.700000
       40      15121  0.150000       0.850000       0.250000       1.000000       0.300000       0.700000
       40      15122  0.150000       0.850000       0.250000       1.000000       0.300000       0.700000
       40      15131  0.130000       0.680000       0.250000       1.000000       0.300000       0.700000
       40      15132  0.130000       0.680000       0.250000       1.000000       0.300000       0.700000
       40      15221  0.150000       0.850000       0.250000       1.000000       0.300000       0.700000
       40      15222  0.150000       0.850000       0.250000       1.000000       0.300000       0.700000
       40      15231  0.130000       0.680000       0.250000       1.000000       0.300000       0.700000
       40      15232  0.130000       0.680000       0.250000       1.000000       0.300000       0.700000
       40      15321  0.150000       0.850000       0.250000       1.000000       0.300000       0.700000
       40      15322  0.150000       0.850000       0.250000       1.000000       0.300000       0.700000
       40      15331  0.130000       0.680000       0.250000       1.000000       0.300000       0.700000
       40      15332  0.130000       0.680000       0.250000       1.000000       0.300000       0.700000
       40      15421  0.150000       0.850000       0.250000       1.000000       0.300000       0.700000
       40      15422  0.150000       0.850000       0.250000       1.000000       0.300000       0.700000
       40      15431  0.130000       0.680000       0.250000       1.000000       0.300000       0.700000
       40      15432  0.130000       0.680000       0.250000       1.000000       0.300000       0.700000
       40      16000  0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
c----------------------------------------------------------------------------------------
c140 pwat-state1
c    initial conditions for the simulation
c
c    defid   parameter group id
c    deluid  landuse id
c    ceps    initial interception storage.
c    surs    initial surface (overland flow) storage.
c    uzs     initial upper zone storage.
c    ifws    initial interflow storage.
c    lzs     initial lower zone storage.
c    agws    initial active groundwater storage.
c    gwvs    initial index to groundwater slope.
c
c defid deluid ceps      surs       uzs      ifws       lzs       agws      gwvs
       33      1000   0.000000       0.000000       0.400000       0.000000       9.000000       2.000000
       0.500000
       33      2000   0.000000       0.000000       0.400000       0.000000       9.000000       2.000000
       0.500000
       33      3000   0.000000       0.000000       0.400000       0.000000       9.000000       2.000000
       0.500000
       33      4000   0.000000       0.000000       0.400000       0.000000       9.000000       2.000000
       0.500000
       33      5000   0.000000       0.000000       0.400000       0.000000       9.000000       2.000000
       0.500000
       33      6000   0.000000       0.000000       0.400000       0.000000       9.000000       2.000000
       0.500000
       33      7000   0.000000       0.000000       0.400000       0.000000       9.000000       2.000000
       0.500000
       33      8000   0.000000       0.000000       0.400000       0.000000       9.000000       2.000000
       0.500000
       33      9000   0.000000       0.000000       0.400000       0.000000       9.000000       2.000000
       0.500000
       33      10000  0.000000       0.000000       0.400000       0.000000       9.000000       2.000000
       0.500000
       33      11111  0.000000       0.000000       0.400000       0.000000       9.000000       2.000000
       0.500000
```

```
33      11112   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
33      11121   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
33      11122   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
33      11211   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
33      11212   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
33      11221   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
33      11222   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
33      11311   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
33      11312   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
33      11321   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
33      11322   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
33      11411   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
33      11412   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
33      11421   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
33      11422   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
33      12111   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
33      12112   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
33      12121   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
33      12122   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
33      12211   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
33      12212   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
33      12221   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
33      12222   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
33      12311   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
33      12312   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
33      12321   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
33      12322   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
33      12411   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
33      12412   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
33      12421   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
33      12422   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
33      13111   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
33      13112   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
33      13121   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
33      13122   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
33      13211   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
33      13212   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
33      13221   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
33      13222   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
```

```
33      13231   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
33      13232   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
33      13311   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
33      13312   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
33      13321   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
33      13322   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
33      13331   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
33      13411   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
33      13412   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
33      13421   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
33      13422   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
33      13431   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
33      13432   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
33      14121   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
33      14122   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
33      14131   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
33      14132   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
33      14221   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
33      14222   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
33      14231   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
33      14232   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
33      14321   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
33      14322   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
33      14331   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
33      14332   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
33      14421   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
33      14422   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
33      14431   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
33      14432   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
33      15121   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
33      15122   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
33      15131   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
33      15132   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
33      15221   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
33      15222   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
33      15231   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
33      15232   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
33      15321   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
33      15322   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
```

```
33      15331   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
33      15332   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
33      15421   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
33      15422   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
33      15431   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
33      15432   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
33      16000   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
40      1000    0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
40      2000    0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
40      3000    0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
40      4000    0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
40      5000    0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
40      6000    0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
40      7000    0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
40      8000    0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
40      9000    0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
40      10000   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
40      11111   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
40      11112   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
40      11121   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
40      11122   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
40      11211   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
40      11212   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
40      11221   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
40      11222   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
40      11311   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
40      11312   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
40      11321   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
40      11322   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
40      11411   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
40      11412   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
40      11421   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
40      11422   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
40      12111   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
40      12112   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
40      12121   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
40      12122   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
40      12211   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
40      12212   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
```

```
40      12221   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
40      12222   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
40      12311   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
40      12312   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
40      12321   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
40      12322   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
40      12411   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
40      12412   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
40      12421   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
40      12422   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
40      13111   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
40      13112   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
40      13121   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
40      13122   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
40      13211   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
40      13212   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
40      13221   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
40      13222   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
40      13231   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
40      13232   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
40      13311   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
40      13312   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
40      13321   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
40      13322   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
40      13331   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
40      13411   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
40      13412   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
40      13421   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
40      13422   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
40      13431   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
40      13432   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
40      14121   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
40      14122   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
40      14131   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
40      14132   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
40      14221   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
40      14222   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
40      14231   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
40      14232   0.000000        0.000000        0.400000        0.000000        9.000000        2.000000
0.500000
```

```
        40     14321  0.000000       0.000000       0.400000       0.000000       9.000000       2.000000
        0.500000
        40     14322  0.000000       0.000000       0.400000       0.000000       9.000000       2.000000
        0.500000
        40     14331  0.000000       0.000000       0.400000       0.000000       9.000000       2.000000
        0.500000
        40     14332  0.000000       0.000000       0.400000       0.000000       9.000000       2.000000
        0.500000
        40     14421  0.000000       0.000000       0.400000       0.000000       9.000000       2.000000
        0.500000
        40     14422  0.000000       0.000000       0.400000       0.000000       9.000000       2.000000
        0.500000
        40     14431  0.000000       0.000000       0.400000       0.000000       9.000000       2.000000
        0.500000
        40     14432  0.000000       0.000000       0.400000       0.000000       9.000000       2.000000
        0.500000
        40     15121  0.000000       0.000000       0.400000       0.000000       9.000000       2.000000
        0.500000
        40     15122  0.000000       0.000000       0.400000       0.000000       9.000000       2.000000
        0.500000
        40     15131  0.000000       0.000000       0.400000       0.000000       9.000000       2.000000
        0.500000
        40     15132  0.000000       0.000000       0.400000       0.000000       9.000000       2.000000
        0.500000
        40     15221  0.000000       0.000000       0.400000       0.000000       9.000000       2.000000
        0.500000
        40     15222  0.000000       0.000000       0.400000       0.000000       9.000000       2.000000
        0.500000
        40     15231  0.000000       0.000000       0.400000       0.000000       9.000000       2.000000
        0.500000
        40     15232  0.000000       0.000000       0.400000       0.000000       9.000000       2.000000
        0.500000
        40     15321  0.000000       0.000000       0.400000       0.000000       9.000000       2.000000
        0.500000
        40     15322  0.000000       0.000000       0.400000       0.000000       9.000000       2.000000
        0.500000
        40     15331  0.000000       0.000000       0.400000       0.000000       9.000000       2.000000
        0.500000
        40     15332  0.000000       0.000000       0.400000       0.000000       9.000000       2.000000
        0.500000
        40     15421  0.000000       0.000000       0.400000       0.000000       9.000000       2.000000
        0.500000
        40     15422  0.000000       0.000000       0.400000       0.000000       9.000000       2.000000
        0.500000
        40     15431  0.000000       0.000000       0.400000       0.000000       9.000000       2.000000
        0.500000
        40     15432  0.000000       0.000000       0.400000       0.000000       9.000000       2.000000
        0.500000
        40     16000  0.000000       0.000000       0.400000       0.000000       9.000000       2.000000
        0.500000
c------------------------------------------------------------------------------------
c150 mon-interception storage (cepscm)
c    only required if vcsfg=1 in pwat-parm1 (see card 100)
c
c    defid   parameter group id
c    deluid  landuse id
c    jan-dec interception storage capacity at start of each month (inches)
c
c defid deluid   jan   feb   mar   apr   may   jun   jul   aug   sep   oct   nov   dec
c------------------------------------------------------------------------------------
c160 mon-upper zone nominal storage (uzsnm)
c    only required if vuzfg=1 in pwat-parm1 (see card 100)
c
c    defid   parameter group id
c    deluid  landuse id
c    jan-dec upper zone nominal storage at start of each month (inches)
c
c defid deluid   jan   feb   mar   apr   may   jun   jul   aug   sep   oct   nov   dec
c--------------------------------------------------------------------------------------
c170 mon-Manning's roughness coefficient (nsurm)
c    only required if vnnfg=1 in pwat-parm1 (see card 100)
c
c    defid   parameter group id
c    deluid  landuse id
c    jan-dec Manning's roughness coefficient at start of each month (none)
c
c defid deluid   jan   feb   mar   apr   may   jun   jul   aug   sep   oct   nov   dec
c--------------------------------------------------------------------------------------
c180 mon-interflow inflow parameter (intfwm)
```

```
c    only required if vifwfg=1 in pwat-parm1 (see card 100)
c
c    defid   parameter group id
c    deluid  landuse id
c    jan-dec interflow inflow parameter at start of each month (none)
c
c defid deluid   jan   feb   mar   apr   may   jun   jul   aug   sep   oct   nov   dec
c---------------------------------------------------------------------------------------
c190 mon-interflow recession constant (ircm)
c    only required if vircfg=1 in pwat-parm1 (see card 100)
c
c    defid   parameter group id
c    deluid  landuse id
c    jan-dec interflow recession constant at start of each month (none)
c
c defid deluid   jan   feb   mar   apr   may   jun   jul   aug   sep   oct   nov   dec
c-------------------------------------------------------------------------------------
c200 mon-lower zone evapotranspiration parameter (lzetpm)
c    only required if vlefg=1 in pwat-parm1 (see card 100)
c
c    defid   parameter group id
c    deluid  landuse id
c    jan-dec lower zone evapotranspiration parameter at start of each month (none)
c
c defid deluid   jan   feb   mar   apr   may   jun   jul   aug   sep   oct   nov   dec
c-------------------------------------------------------------------------------------
c201   Irrigation Application Option Flags
cIrrigation flag decide whether to run irrigation
c
c    irrigfg   if = 1 run irrigation option
c    petfg     if = 1 use constant PET rather than time series from the air file
c    monVaryIrrig   if = 1 use monthly varying ET coefficient
c
c irrigfg  petfg  monVaryIrrig
        1      1      1
c------------------------------------------------------------------------------------------
c202 Irrigation PET Value
c   defid        Group ID number.
c   petval       Constant PET value to calculate actual ET (in/hr)
c
c defid  petval
        33      0.500000
        40      0.500000
c---------------------------------------------------------------------------------------------
c203 Irrigation Application Options
c   defid        Group ID number.
c   deluid       Landuse ID number
c   startmonth   startmonth of irrigation requirement
c   endmonth     endmonth of irrigation requirement
c   fraction1    fraction of irrigation requirement applied over the canopy.
c   fraction2    fraction of irrigation water applied directly to the soil surface.
c   fraction3    fraction of irrigation water applied to the upper soil zone via buried systems
c   fraction4    fraction of irrigation water likewise applied to the lower soil zone.
c   fraction5    fraction of irrigation water entering directly into the local groundwater, such as seepage
irrigation.
c   etcoeff      Coefficient to calculate actual ET, based on PET.
c   etdays       Number of threshold days to calculate irrigation demand (pet*etcoeff - precip)
c                (if etdays = 0 then irrigation demand = pet * etcoeff)
c
c defid deluid startmonth endmonth fraction1 fraction2 fraction3 fraction4 fraction5 etcoeff etdays
        33      1000    1       12      0.000000       0.000000       0.000000       0.000000       0.000000
        1.000000       0
        33      2000    1       12      0.000000       0.000000       0.000000       0.000000       0.000000
        1.000000       0
        33      3000    1       12      0.000000       0.000000       0.000000       0.000000       0.000000
        1.000000       0
        33      4000    1       12      0.000000       0.000000       0.000000       0.000000       0.000000
        1.000000       0
        33      5000    1       12      0.000000       0.000000       0.000000       0.000000       0.000000
        1.000000       0
        33      6000    1       12      0.000000       0.000000       0.000000       0.000000       0.000000
        1.000000       0
        33      7000    1       12      0.000000       0.000000       0.000000       0.000000       0.000000
        1.000000       0
        33      8000    1       12      0.000000       0.000000       0.000000       0.000000       0.000000
        1.000000       0
        33      9000    1       12      0.000000       0.000000       0.000000       0.000000       0.000000
        1.000000       0
```

```
33      10000   1       12      1.000000        0.000000        0.000000        0.000000        0.000000
1.000000        0
33      11111   1       12      1.000000        0.000000        0.000000        0.000000        0.000000
1.000000        0
33      11112   1       12      1.000000        0.000000        0.000000        0.000000        0.000000
1.000000        0
33      11121   1       12      1.000000        0.000000        0.000000        0.000000        0.000000
1.000000        0
33      11122   1       12      1.000000        0.000000        0.000000        0.000000        0.000000
1.000000        0
33      11211   1       12      1.000000        0.000000        0.000000        0.000000        0.000000
1.000000        0
33      11212   1       12      1.000000        0.000000        0.000000        0.000000        0.000000
1.000000        0
33      11221   1       12      1.000000        0.000000        0.000000        0.000000        0.000000
1.000000        0
33      11222   1       12      1.000000        0.000000        0.000000        0.000000        0.000000
1.000000        0
33      11311   1       12      1.000000        0.000000        0.000000        0.000000        0.000000
1.000000        0
33      11312   1       12      1.000000        0.000000        0.000000        0.000000        0.000000
1.000000        0
33      11321   1       12      1.000000        0.000000        0.000000        0.000000        0.000000
1.000000        0
33      11322   1       12      1.000000        0.000000        0.000000        0.000000        0.000000
1.000000        0
33      11411   1       12      1.000000        0.000000        0.000000        0.000000        0.000000
1.000000        0
33      11412   1       12      1.000000        0.000000        0.000000        0.000000        0.000000
1.000000        0
33      11421   1       12      1.000000        0.000000        0.000000        0.000000        0.000000
1.000000        0
33      11422   1       12      1.000000        0.000000        0.000000        0.000000        0.000000
1.000000        0
33      12111   1       12      0.000000        0.000000        0.000000        0.000000        0.000000
1.000000        0
33      12112   1       12      0.000000        0.000000        0.000000        0.000000        0.000000
1.000000        0
33      12121   1       12      0.000000        0.000000        0.000000        0.000000        0.000000
1.000000        0
33      12122   1       12      0.000000        0.000000        0.000000        0.000000        0.000000
1.000000        0
33      12211   1       12      0.000000        0.000000        0.000000        0.000000        0.000000
1.000000        0
33      12212   1       12      0.000000        0.000000        0.000000        0.000000        0.000000
1.000000        0
33      12221   1       12      0.000000        0.000000        0.000000        0.000000        0.000000
1.000000        0
33      12222   1       12      0.000000        0.000000        0.000000        0.000000        0.000000
1.000000        0
33      12311   1       12      0.000000        0.000000        0.000000        0.000000        0.000000
1.000000        0
33      12312   1       12      0.000000        0.000000        0.000000        0.000000        0.000000
1.000000        0
33      12321   1       12      0.000000        0.000000        0.000000        0.000000        0.000000
1.000000        0
33      12322   1       12      0.000000        0.000000        0.000000        0.000000        0.000000
1.000000        0
33      12411   1       12      0.000000        0.000000        0.000000        0.000000        0.000000
1.000000        0
33      12412   1       12      0.000000        0.000000        0.000000        0.000000        0.000000
1.000000        0
33      12421   1       12      0.000000        0.000000        0.000000        0.000000        0.000000
1.000000        0
33      12422   1       12      0.000000        0.000000        0.000000        0.000000        0.000000
1.000000        0
33      13111   1       12      0.000000        0.000000        0.000000        0.000000        0.000000
1.000000        0
33      13112   1       12      0.000000        0.000000        0.000000        0.000000        0.000000
1.000000        0
33      13121   1       12      0.000000        0.000000        0.000000        0.000000        0.000000
1.000000        0
33      13122   1       12      0.000000        0.000000        0.000000        0.000000        0.000000
1.000000        0
33      13211   1       12      0.000000        0.000000        0.000000        0.000000        0.000000
1.000000        0
33      13212   1       12      0.000000        0.000000        0.000000        0.000000        0.000000
1.000000        0
```

```
33      13221  1       12      0.000000        0.000000        0.000000        0.000000        0.000000
1.000000       0
33      13222  1       12      0.000000        0.000000        0.000000        0.000000        0.000000
1.000000       0
33      13231  1       12      0.000000        0.000000        0.000000        0.000000        0.000000
1.000000       0
33      13232  1       12      0.000000        0.000000        0.000000        0.000000        0.000000
1.000000       0
33      13311  1       12      0.000000        0.000000        0.000000        0.000000        0.000000
1.000000       0
33      13312  1       12      0.000000        0.000000        0.000000        0.000000        0.000000
1.000000       0
33      13321  1       12      0.000000        0.000000        0.000000        0.000000        0.000000
1.000000       0
33      13322  1       12      0.000000        0.000000        0.000000        0.000000        0.000000
1.000000       0
33      13331  1       12      0.000000        0.000000        0.000000        0.000000        0.000000
1.000000       0
33      13411  1       12      0.000000        0.000000        0.000000        0.000000        0.000000
1.000000       0
33      13412  1       12      0.000000        0.000000        0.000000        0.000000        0.000000
1.000000       0
33      13421  1       12      0.000000        0.000000        0.000000        0.000000        0.000000
1.000000       0
33      13422  1       12      0.000000        0.000000        0.000000        0.000000        0.000000
1.000000       0
33      13431  1       12      0.000000        0.000000        0.000000        0.000000        0.000000
1.000000       0
33      13432  1       12      0.000000        0.000000        0.000000        0.000000        0.000000
1.000000       0
33      14121  1       12      0.000000        0.000000        0.000000        0.000000        0.000000
1.000000       0
33      14122  1       12      0.000000        0.000000        0.000000        0.000000        0.000000
1.000000       0
33      14131  1       12      0.000000        0.000000        0.000000        0.000000        0.000000
1.000000       0
33      14132  1       12      0.000000        0.000000        0.000000        0.000000        0.000000
1.000000       0
33      14221  1       12      0.000000        0.000000        0.000000        0.000000        0.000000
1.000000       0
33      14222  1       12      0.000000        0.000000        0.000000        0.000000        0.000000
1.000000       0
33      14231  1       12      0.000000        0.000000        0.000000        0.000000        0.000000
1.000000       0
33      14232  1       12      0.000000        0.000000        0.000000        0.000000        0.000000
1.000000       0
33      14321  1       12      0.000000        0.000000        0.000000        0.000000        0.000000
1.000000       0
33      14322  1       12      0.000000        0.000000        0.000000        0.000000        0.000000
1.000000       0
33      14331  1       12      0.000000        0.000000        0.000000        0.000000        0.000000
1.000000       0
33      14332  1       12      0.000000        0.000000        0.000000        0.000000        0.000000
1.000000       0
33      14421  1       12      0.000000        0.000000        0.000000        0.000000        0.000000
1.000000       0
33      14422  1       12      0.000000        0.000000        0.000000        0.000000        0.000000
1.000000       0
33      14431  1       12      0.000000        0.000000        0.000000        0.000000        0.000000
1.000000       0
33      14432  1       12      0.000000        0.000000        0.000000        0.000000        0.000000
1.000000       0
33      15121  1       12      0.000000        0.000000        0.000000        0.000000        0.000000
1.000000       0
33      15122  1       12      0.000000        0.000000        0.000000        0.000000        0.000000
1.000000       0
33      15131  1       12      0.000000        0.000000        0.000000        0.000000        0.000000
1.000000       0
33      15132  1       12      0.000000        0.000000        0.000000        0.000000        0.000000
1.000000       0
33      15221  1       12      0.000000        0.000000        0.000000        0.000000        0.000000
1.000000       0
33      15222  1       12      0.000000        0.000000        0.000000        0.000000        0.000000
1.000000       0
33      15231  1       12      0.000000        0.000000        0.000000        0.000000        0.000000
1.000000       0
33      15232  1       12      0.000000        0.000000        0.000000        0.000000        0.000000
1.000000       0
```

```
33      15321   1       12      0.000000        0.000000        0.000000        0.000000        0.000000
1.000000        0
33      15322   1       12      0.000000        0.000000        0.000000        0.000000        0.000000
1.000000        0
33      15331   1       12      0.000000        0.000000        0.000000        0.000000        0.000000
1.000000        0
33      15332   1       12      0.000000        0.000000        0.000000        0.000000        0.000000
1.000000        0
33      15421   1       12      0.000000        0.000000        0.000000        0.000000        0.000000
1.000000        0
33      15422   1       12      0.000000        0.000000        0.000000        0.000000        0.000000
1.000000        0
33      15431   1       12      0.000000        0.000000        0.000000        0.000000        0.000000
1.000000        0
33      15432   1       12      0.000000        0.000000        0.000000        0.000000        0.000000
1.000000        0
33      16000   1       12      0.000000        0.000000        0.000000        0.000000        0.000000
1.000000        0
40      1000    1       12      0.000000        0.000000        0.000000        0.000000        0.000000
1.000000        0
40      2000    1       12      0.000000        0.000000        0.000000        0.000000        0.000000
1.000000        0
40      3000    1       12      0.000000        0.000000        0.000000        0.000000        0.000000
1.000000        0
40      4000    1       12      0.000000        0.000000        0.000000        0.000000        0.000000
1.000000        0
40      5000    1       12      0.000000        0.000000        0.000000        0.000000        0.000000
1.000000        0
40      6000    1       12      0.000000        0.000000        0.000000        0.000000        0.000000
1.000000        0
40      7000    1       12      0.000000        0.000000        0.000000        0.000000        0.000000
1.000000        0
40      8000    1       12      0.000000        0.000000        0.000000        0.000000        0.000000
1.000000        0
40      9000    1       12      0.000000        0.000000        0.000000        0.000000        0.000000
1.000000        0
40      10000   1       12      1.000000        0.000000        0.000000        0.000000        0.000000
1.000000        0
40      11111   1       12      1.000000        0.000000        0.000000        0.000000        0.000000
1.000000        0
40      11112   1       12      1.000000        0.000000        0.000000        0.000000        0.000000
1.000000        0
40      11121   1       12      1.000000        0.000000        0.000000        0.000000        0.000000
1.000000        0
40      11122   1       12      1.000000        0.000000        0.000000        0.000000        0.000000
1.000000        0
40      11211   1       12      1.000000        0.000000        0.000000        0.000000        0.000000
1.000000        0
40      11212   1       12      1.000000        0.000000        0.000000        0.000000        0.000000
1.000000        0
40      11221   1       12      1.000000        0.000000        0.000000        0.000000        0.000000
1.000000        0
40      11222   1       12      1.000000        0.000000        0.000000        0.000000        0.000000
1.000000        0
40      11311   1       12      1.000000        0.000000        0.000000        0.000000        0.000000
1.000000        0
40      11312   1       12      1.000000        0.000000        0.000000        0.000000        0.000000
1.000000        0
40      11321   1       12      1.000000        0.000000        0.000000        0.000000        0.000000
1.000000        0
40      11322   1       12      1.000000        0.000000        0.000000        0.000000        0.000000
1.000000        0
40      11411   1       12      1.000000        0.000000        0.000000        0.000000        0.000000
1.000000        0
40      11412   1       12      1.000000        0.000000        0.000000        0.000000        0.000000
1.000000        0
40      11421   1       12      1.000000        0.000000        0.000000        0.000000        0.000000
1.000000        0
40      11422   1       12      1.000000        0.000000        0.000000        0.000000        0.000000
1.000000        0
40      12111   1       12      0.000000        0.000000        0.000000        0.000000        0.000000
1.000000        0
40      12112   1       12      0.000000        0.000000        0.000000        0.000000        0.000000
1.000000        0
40      12121   1       12      0.000000        0.000000        0.000000        0.000000        0.000000
1.000000        0
40      12122   1       12      0.000000        0.000000        0.000000        0.000000        0.000000
1.000000        0
```

```
40      12211   1       12      0.000000        0.000000        0.000000        0.000000        0.000000
1.000000        0
40      12212   1       12      0.000000        0.000000        0.000000        0.000000        0.000000
1.000000        0
40      12221   1       12      0.000000        0.000000        0.000000        0.000000        0.000000
1.000000        0
40      12222   1       12      0.000000        0.000000        0.000000        0.000000        0.000000
1.000000        0
40      12311   1       12      0.000000        0.000000        0.000000        0.000000        0.000000
1.000000        0
40      12312   1       12      0.000000        0.000000        0.000000        0.000000        0.000000
1.000000        0
40      12321   1       12      0.000000        0.000000        0.000000        0.000000        0.000000
1.000000        0
40      12322   1       12      0.000000        0.000000        0.000000        0.000000        0.000000
1.000000        0
40      12411   1       12      0.000000        0.000000        0.000000        0.000000        0.000000
1.000000        0
40      12412   1       12      0.000000        0.000000        0.000000        0.000000        0.000000
1.000000        0
40      12421   1       12      0.000000        0.000000        0.000000        0.000000        0.000000
1.000000        0
40      12422   1       12      0.000000        0.000000        0.000000        0.000000        0.000000
1.000000        0
40      13111   1       12      0.000000        0.000000        0.000000        0.000000        0.000000
1.000000        0
40      13112   1       12      0.000000        0.000000        0.000000        0.000000        0.000000
1.000000        0
40      13121   1       12      0.000000        0.000000        0.000000        0.000000        0.000000
1.000000        0
40      13122   1       12      0.000000        0.000000        0.000000        0.000000        0.000000
1.000000        0
40      13211   1       12      0.000000        0.000000        0.000000        0.000000        0.000000
1.000000        0
40      13212   1       12      0.000000        0.000000        0.000000        0.000000        0.000000
1.000000        0
40      13221   1       12      0.000000        0.000000        0.000000        0.000000        0.000000
1.000000        0
40      13222   1       12      0.000000        0.000000        0.000000        0.000000        0.000000
1.000000        0
40      13231   1       12      0.000000        0.000000        0.000000        0.000000        0.000000
1.000000        0
40      13232   1       12      0.000000        0.000000        0.000000        0.000000        0.000000
1.000000        0
40      13311   1       12      0.000000        0.000000        0.000000        0.000000        0.000000
1.000000        0
40      13312   1       12      0.000000        0.000000        0.000000        0.000000        0.000000
1.000000        0
40      13321   1       12      0.000000        0.000000        0.000000        0.000000        0.000000
1.000000        0
40      13322   1       12      0.000000        0.000000        0.000000        0.000000        0.000000
1.000000        0
40      13331   1       12      0.000000        0.000000        0.000000        0.000000        0.000000
1.000000        0
40      13411   1       12      0.000000        0.000000        0.000000        0.000000        0.000000
1.000000        0
40      13412   1       12      0.000000        0.000000        0.000000        0.000000        0.000000
1.000000        0
40      13421   1       12      0.000000        0.000000        0.000000        0.000000        0.000000
1.000000        0
40      13422   1       12      0.000000        0.000000        0.000000        0.000000        0.000000
1.000000        0
40      13431   1       12      0.000000        0.000000        0.000000        0.000000        0.000000
1.000000        0
40      13432   1       12      0.000000        0.000000        0.000000        0.000000        0.000000
1.000000        0
40      14121   1       12      0.000000        0.000000        0.000000        0.000000        0.000000
1.000000        0
40      14122   1       12      0.000000        0.000000        0.000000        0.000000        0.000000
1.000000        0
40      14131   1       12      0.000000        0.000000        0.000000        0.000000        0.000000
1.000000        0
40      14132   1       12      0.000000        0.000000        0.000000        0.000000        0.000000
1.000000        0
40      14221   1       12      0.000000        0.000000        0.000000        0.000000        0.000000
1.000000        0
40      14222   1       12      0.000000        0.000000        0.000000        0.000000        0.000000
1.000000        0
```

```
        40      14231   1       12      0.000000        0.000000        0.000000        0.000000        0.000000
        1.000000        0
        40      14232   1       12      0.000000        0.000000        0.000000        0.000000        0.000000
        1.000000        0
        40      14321   1       12      0.000000        0.000000        0.000000        0.000000        0.000000
        1.000000        0
        40      14322   1       12      0.000000        0.000000        0.000000        0.000000        0.000000
        1.000000        0
        40      14331   1       12      0.000000        0.000000        0.000000        0.000000        0.000000
        1.000000        0
        40      14332   1       12      0.000000        0.000000        0.000000        0.000000        0.000000
        1.000000        0
        40      14421   1       12      0.000000        0.000000        0.000000        0.000000        0.000000
        1.000000        0
        40      14422   1       12      0.000000        0.000000        0.000000        0.000000        0.000000
        1.000000        0
        40      14431   1       12      0.000000        0.000000        0.000000        0.000000        0.000000
        1.000000        0
        40      14432   1       12      0.000000        0.000000        0.000000        0.000000        0.000000
        1.000000        0
        40      15121   1       12      0.000000        0.000000        0.000000        0.000000        0.000000
        1.000000        0
        40      15122   1       12      0.000000        0.000000        0.000000        0.000000        0.000000
        1.000000        0
        40      15131   1       12      0.000000        0.000000        0.000000        0.000000        0.000000
        1.000000        0
        40      15132   1       12      0.000000        0.000000        0.000000        0.000000        0.000000
        1.000000        0
        40      15221   1       12      0.000000        0.000000        0.000000        0.000000        0.000000
        1.000000        0
        40      15222   1       12      0.000000        0.000000        0.000000        0.000000        0.000000
        1.000000        0
        40      15231   1       12      0.000000        0.000000        0.000000        0.000000        0.000000
        1.000000        0
        40      15232   1       12      0.000000        0.000000        0.000000        0.000000        0.000000
        1.000000        0
        40      15321   1       12      0.000000        0.000000        0.000000        0.000000        0.000000
        1.000000        0
        40      15322   1       12      0.000000        0.000000        0.000000        0.000000        0.000000
        1.000000        0
        40      15331   1       12      0.000000        0.000000        0.000000        0.000000        0.000000
        1.000000        0
        40      15332   1       12      0.000000        0.000000        0.000000        0.000000        0.000000
        1.000000        0
        40      15421   1       12      0.000000        0.000000        0.000000        0.000000        0.000000
        1.000000        0
        40      15422   1       12      0.000000        0.000000        0.000000        0.000000        0.000000
        1.000000        0
        40      15431   1       12      0.000000        0.000000        0.000000        0.000000        0.000000
        1.000000        0
        40      15432   1       12      0.000000        0.000000        0.000000        0.000000        0.000000
        1.000000        0
        40      16000   1       12      0.000000        0.000000        0.000000        0.000000        0.000000
        1.000000        0
c--------------------------------------------------------------------------------------------
c204 Monthly-variable ET coefficients
c   defid        Group ID number.
c   deluid       Landuse ID number
c   monetcs      Monthly-variable coefficient to calculate actual ET for Jan..Dec
c
c defid deluid monETCs1 monETCs2 monETCs3 monETCs4 monETCs5 monETCs6 monETCs7 monETCs8 monETCs9 monETCs10
monETCs11 monETCs12
        33      1000    0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
        0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
        33      2000    0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
        0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
        33      3000    0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
        0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
        33      4000    0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
        0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
        33      5000    0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
        0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
        33      6000    0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
        0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
        33      7000    0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
        0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
        33      8000    0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
        0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
```

```
33      9000   0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
33      10000  0.000569       0.001419       0.001327       0.005918       0.006185       0.011507
0.012554       0.013237       0.011520       0.009339       0.006252       0.000000
33      11111  0.000569       0.001419       0.001327       0.005918       0.006185       0.011507
0.012554       0.013237       0.011520       0.009339       0.006252       0.000000
33      11112  0.000569       0.001419       0.001327       0.005918       0.006185       0.011507
0.012554       0.013237       0.011520       0.009339       0.006252       0.000000
33      11121  0.000569       0.001419       0.001327       0.005918       0.006185       0.011507
0.012554       0.013237       0.011520       0.009339       0.006252       0.000000
33      11122  0.000569       0.001419       0.001327       0.005918       0.006185       0.011507
0.012554       0.013237       0.011520       0.009339       0.006252       0.000000
33      11211  0.000569       0.001419       0.001327       0.005918       0.006185       0.011507
0.012554       0.013237       0.011520       0.009339       0.006252       0.000000
33      11212  0.000569       0.001419       0.001327       0.005918       0.006185       0.011507
0.012554       0.013237       0.011520       0.009339       0.006252       0.000000
33      11221  0.000569       0.001419       0.001327       0.005918       0.006185       0.011507
0.012554       0.013237       0.011520       0.009339       0.006252       0.000000
33      11222  0.000569       0.001419       0.001327       0.005918       0.006185       0.011507
0.012554       0.013237       0.011520       0.009339       0.006252       0.000000
33      11311  0.000569       0.001419       0.001327       0.005918       0.006185       0.011507
0.012554       0.013237       0.011520       0.009339       0.006252       0.000000
33      11312  0.000569       0.001419       0.001327       0.005918       0.006185       0.011507
0.012554       0.013237       0.011520       0.009339       0.006252       0.000000
33      11321  0.000569       0.001419       0.001327       0.005918       0.006185       0.011507
0.012554       0.013237       0.011520       0.009339       0.006252       0.000000
33      11322  0.000569       0.001419       0.001327       0.005918       0.006185       0.011507
0.012554       0.013237       0.011520       0.009339       0.006252       0.000000
33      11411  0.000569       0.001419       0.001327       0.005918       0.006185       0.011507
0.012554       0.013237       0.011520       0.009339       0.006252       0.000000
33      11412  0.000569       0.001419       0.001327       0.005918       0.006185       0.011507
0.012554       0.013237       0.011520       0.009339       0.006252       0.000000
33      11421  0.000569       0.001419       0.001327       0.005918       0.006185       0.011507
0.012554       0.013237       0.011520       0.009339       0.006252       0.000000
33      11422  0.000569       0.001419       0.001327       0.005918       0.006185       0.011507
0.012554       0.013237       0.011520       0.009339       0.006252       0.000000
33      12111  0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
33      12112  0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
33      12121  0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
33      12122  0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
33      12211  0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
33      12212  0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
33      12221  0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
33      12222  0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
33      12311  0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
33      12312  0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
33      12321  0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
33      12322  0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
33      12411  0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
33      12412  0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
33      12421  0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
33      12422  0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
33      13111  0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
33      13112  0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
33      13121  0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
33      13122  0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
33      13211  0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
```

```
33     13212   0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
33     13221   0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
33     13222   0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
33     13231   0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
33     13232   0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
33     13311   0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
33     13312   0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
33     13321   0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
33     13322   0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
33     13331   0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
33     13411   0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
33     13412   0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
33     13421   0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
33     13422   0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
33     13431   0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
33     13432   0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
33     14121   0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
33     14122   0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
33     14131   0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
33     14132   0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
33     14221   0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
33     14222   0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
33     14231   0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
33     14232   0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
33     14321   0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
33     14322   0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
33     14331   0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
33     14332   0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
33     14421   0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
33     14422   0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
33     14431   0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
33     14432   0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
33     15121   0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
33     15122   0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
33     15131   0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
33     15132   0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
33     15221   0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
33     15222   0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
33     15231   0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
```

```
33     15232   0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
33     15321   0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
33     15322   0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
33     15331   0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
33     15332   0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
33     15421   0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
33     15422   0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
33     15431   0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
33     15432   0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
33     16000   0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
40     1000    0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
40     2000    0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
40     3000    0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
40     4000    0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
40     5000    0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
40     6000    0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
40     7000    0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
40     8000    0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
40     9000    0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
40     10000   0.000569       0.001419       0.001327       0.005918       0.006185       0.011507
0.012554       0.013237       0.011520       0.009339       0.006252       0.000000
40     11111   0.000569       0.001419       0.001327       0.005918       0.006185       0.011507
0.012554       0.013237       0.011520       0.009339       0.006252       0.000000
40     11112   0.000569       0.001419       0.001327       0.005918       0.006185       0.011507
0.012554       0.013237       0.011520       0.009339       0.006252       0.000000
40     11121   0.000569       0.001419       0.001327       0.005918       0.006185       0.011507
0.012554       0.013237       0.011520       0.009339       0.006252       0.000000
40     11122   0.000569       0.001419       0.001327       0.005918       0.006185       0.011507
0.012554       0.013237       0.011520       0.009339       0.006252       0.000000
40     11211   0.000569       0.001419       0.001327       0.005918       0.006185       0.011507
0.012554       0.013237       0.011520       0.009339       0.006252       0.000000
40     11212   0.000569       0.001419       0.001327       0.005918       0.006185       0.011507
0.012554       0.013237       0.011520       0.009339       0.006252       0.000000
40     11221   0.000569       0.001419       0.001327       0.005918       0.006185       0.011507
0.012554       0.013237       0.011520       0.009339       0.006252       0.000000
40     11222   0.000569       0.001419       0.001327       0.005918       0.006185       0.011507
0.012554       0.013237       0.011520       0.009339       0.006252       0.000000
40     11311   0.000569       0.001419       0.001327       0.005918       0.006185       0.011507
0.012554       0.013237       0.011520       0.009339       0.006252       0.000000
40     11312   0.000569       0.001419       0.001327       0.005918       0.006185       0.011507
0.012554       0.013237       0.011520       0.009339       0.006252       0.000000
40     11321   0.000569       0.001419       0.001327       0.005918       0.006185       0.011507
0.012554       0.013237       0.011520       0.009339       0.006252       0.000000
40     11322   0.000569       0.001419       0.001327       0.005918       0.006185       0.011507
0.012554       0.013237       0.011520       0.009339       0.006252       0.000000
40     11411   0.000569       0.001419       0.001327       0.005918       0.006185       0.011507
0.012554       0.013237       0.011520       0.009339       0.006252       0.000000
40     11412   0.000569       0.001419       0.001327       0.005918       0.006185       0.011507
0.012554       0.013237       0.011520       0.009339       0.006252       0.000000
40     11421   0.000569       0.001419       0.001327       0.005918       0.006185       0.011507
0.012554       0.013237       0.011520       0.009339       0.006252       0.000000
40     11422   0.000569       0.001419       0.001327       0.005918       0.006185       0.011507
0.012554       0.013237       0.011520       0.009339       0.006252       0.000000
40     12111   0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
40     12112   0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
40     12121   0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
```

```
40      12122  0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
40      12211  0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
40      12212  0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
40      12221  0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
40      12222  0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
40      12311  0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
40      12312  0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
40      12321  0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
40      12322  0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
40      12411  0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
40      12412  0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
40      12421  0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
40      12422  0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
40      13111  0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
40      13112  0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
40      13121  0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
40      13122  0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
40      13211  0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
40      13212  0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
40      13221  0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
40      13222  0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
40      13231  0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
40      13232  0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
40      13311  0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
40      13312  0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
40      13321  0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
40      13322  0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
40      13331  0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
40      13411  0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
40      13412  0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
40      13421  0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
40      13422  0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
40      13431  0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
40      13432  0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
40      14121  0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
40      14122  0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
40      14131  0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
40      14132  0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
40      14221  0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
```

```
        40      14222  0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
        0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
        40      14231  0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
        0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
        40      14232  0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
        0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
        40      14321  0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
        0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
        40      14322  0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
        0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
        40      14331  0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
        0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
        40      14332  0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
        0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
        40      14421  0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
        0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
        40      14422  0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
        0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
        40      14431  0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
        0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
        40      14432  0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
        0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
        40      15121  0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
        0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
        40      15122  0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
        0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
        40      15131  0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
        0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
        40      15132  0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
        0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
        40      15221  0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
        0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
        40      15222  0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
        0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
        40      15231  0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
        0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
        40      15232  0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
        0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
        40      15321  0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
        0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
        40      15322  0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
        0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
        40      15331  0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
        0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
        40      15332  0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
        0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
        40      15421  0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
        0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
        40      15422  0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
        0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
        40      15431  0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
        0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
        40      15432  0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
        0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
        40      16000  0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
        0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
c--------------------------------------------------------------------------------------------
c205 Irrigation Withdrawal Options
c Irrigation withdrawal information for each watershed
c    subbasin    subbasin id
c    rchid       reach id from where water is withdrawn (if reach does not exist then
c                etdemand is assumed to be satisfied from an external source)
c    irrigdep    depth of irrigation withdrawal pipe (ft)
c
c subbasin rchid
        6665    0      0.000000
        6671    0      0.000000
        6673    0      0.000000
        6674    0      0.000000
        6675    0      0.000000
        6684    0      0.000000
        6839    0      0.000000
        6844    0      0.000000
        6850    0      0.000000
        6856    0      0.000000
        6859    0      0.000000
        6861    0      0.000000
c--------------------------------------------------------------------------------------------
c250 general quality constituent control
```

```
c
c    defid    parameter group id
c    dwqid    general quality id
c    qname    name of qual (must be a continuous string)
c    qunit    units for quality constituent output (mg/l), (ug/l), or (#/100ml)
c    qsdfg    if = 0 no sediment associated qual
c       if = 1 sediment associated in pervious/impervious land (qsdfg should be > 0 in card 281)
c       if = 2 sediment associated in pervious/impervious land
c              and sediment associated qual is added to the dissolved part
c    gqsdfg   if = 0 general quality constituent
c             if = 1 general quality constituent simulated as a sediment (only one qual can be simulated as a
sediment in each group)
c    qsofg    if = 1 then then accumulation and removal occur daily
c             if = 2 then then accumulation and removal occur every interval
c    potfcfg  if = 1 then apply background concentration potency factor (card 260) to only surface output
c             if = 2 then apply background concentration potency factor (card 260) to total land output
c
c defid dwqid   qname  qunit  qsdfg  gqsdfg  qsofg  potfcfg
       33      3       TN      (mg/l)  0       0       2       1
       33      7       TP      (mg/l)  2       0       2       1
       33      10      TCd     (ug/l)  2       0       2       1
       33      11      TCu     (ug/l)  2       0       2       1
       33      12      TPb     (ug/l)  2       0       2       1
       33      14      TZn     (ug/l)  2       0       2       1
       40      3       TN      (mg/l)  0       0       2       1
       40      7       TP      (mg/l)  2       0       2       1
       40      10      TCd     (ug/l)  2       0       2       1
       40      11      TCu     (ug/l)  2       0       2       1
       40      12      TPb     (ug/l)  2       0       2       1
       40      14      TZn     (ug/l)  2       0       2       1
c------------------------------------------------------------------------------------------------------------
C255 subsurface quality control
c
c    (value of 0 = use constant qual-input; 1 = use corresponding monthly variable card)
c
c    vqofg       if = 1 the accumulation rate and limiting storage of QUALOF varies monthly   (cards 270, 271)
c    qsowfg      if = 1 the constituent is a QUALSURO (surface flow associated).
c    vsqcfg      if = 1 the concentration of this constituent in surface outflow varies monthly   (card 272)= 1
read table 272
c    qifwfg      if = 1 the constituent is a QUALIF (interflow associated).
c    viqcfg      if = 1 the concentration of this constituent in interflow outflow varies monthly   (card 273)=
1 read table 273
c    qagwfg      if = 1 the constituent is a QUALGW (groundwater associated).
c    vaqcfg      if = 1 the concentration of this constituent in groundwater outflow varies monthly (card 274)
c    adfglnd     if = 1 atmosperic deposition on land
c    maddfglnd   if = 1 atmosperic dry deposition varies monthly on land (card 275)
c    mawdfglnd   if = 1 atmosperic wet deposition varies monthly on land (card 276)
c
c vqofg  qsowfg  vsqcfg  qifwfg  viqcfg  qagwfg  vaqcfg  adfglnd  maddfglnd  mawdfglnd
       0       1       0       1       0       1       0       1       0       0
c------------------------------------------------------------------------------------------------------------
C260  qual-input
c    storage on surface and nonseasonal parameters
c
c    defid   parameter group id
c    dwqid   general quality id
c    deluid  landuse id
c    sqo     initial storage of QUALOF on surface (lb or #)
c    potfw   washoff potency factor if qsdfg > 0, card 250 (lb or #)/ton-sediment
c    potfs   scour potency pactor if qsdfg > 0, card 250 (lb or #)/ton-sediment
c    potfc   background concentration potency pactor if qsdfg > 0, card 250 (lb or #)/ton-sediment
c    acqop   accumulation rate of QUALOF on surface (lb or #)/acre/day
c    sqolim  maximum storage of QUALOF on surface (lb or #)/acre
c    wsqop   rate of surface runoff that removes 90% of stored QUALOF per hour (in/hr)
c    soqc    concentration of constituent in surface outflow (mg/l), (ug/l), or (#/100ml)
c    ioqc    concentration of constituent in interflow outflow (mg/l), (ug/l), or (#/100ml)
c    aoqc    concentration of constituent in groundwater outflow (mg/l), (ug/l), or (#/100ml)
c    addc    atmospheric dry deposition flux (lb/acre/day or #/acre/day)
c    awdc    atmospheric wet deposition concentration (mg/l), (ug/l), or (#/100ml)
c
c the units of the following parameters are as follow:
c if in card 250, the unit is mg/l or ug/l, then M is lbs
c if in card 250, the unit is #/100ml, then M is #, in this case the unit for
c soqc, ioqc and aoqc should be #/100ml instead of mg/l
c
c defid  dwqid  deluid  sqo     potfw     potfs   potfc   acqop   sqolim   wsqop    soqc   ioqc   aoqc   addc
awdc
       33      3       1000    0.000000       0.000000       0.000000       0.000000       0.001000
       0.500000       0.800000       0.000000       0.000000       0.000000       0.000000       0.000000
```

```
33      3       2000    0.000000        0.000000        0.000000        0.000000        0.001000
0.500000        0.800000        0.000000        0.000000        0.000000        0.000000        0.000000
33      3       3000    0.000000        0.000000        0.000000        0.000000        0.001000
0.500000        0.800000        0.000000        0.000000        0.000000        0.000000        0.000000
33      3       4000    0.000000        0.000000        0.000000        0.000000        0.060000
1.400000        0.600000        0.000000        0.000000        0.000000        0.000000        0.000000
33      3       5000    0.000000        0.000000        0.000000        0.000000        0.080000
1.400000        0.600000        0.000000        0.000000        0.000000        0.000000        0.000000
33      3       6000    0.000000        0.000000        0.000000        0.000000        0.200000
0.800000        0.800000        0.000000        0.000000        0.000000        0.000000        0.000000
33      3       7000    0.000000        0.000000        0.000000        0.000000        0.100000
0.800000        0.900000        0.000000        0.000000        0.000000        0.000000        0.000000
33      3       8000    0.000000        0.000000        0.000000        0.000000        0.020000
0.800000        0.600000        0.000000        0.000000        0.000000        0.000000        0.000000
33      3       9000    0.000000        0.000000        0.000000        0.000000        0.020000
0.800000        0.600000        0.000000        0.000000        0.000000        0.000000        0.000000
33      3       10000   0.000000        0.000000        0.000000        0.000000        0.000000
0.000001        1.640000        4.000000        0.000000        0.000000        0.000000        0.000000
33      3       11111   0.000000        0.000000        0.000000        0.000000        0.010000
0.800000        1.640000        0.000000        1.000000        0.300000        0.000000        0.000000
33      3       11112   0.000000        0.000000        0.000000        0.000000        0.010000
0.800000        1.640000        0.000000        1.000000        0.300000        0.000000        0.000000
33      3       11121   0.000000        0.000000        0.000000        0.000000        0.010000
0.800000        1.640000        0.000000        1.000000        0.300000        0.000000        0.000000
33      3       11122   0.000000        0.000000        0.000000        0.000000        0.010000
0.800000        1.640000        0.000000        1.000000        0.300000        0.000000        0.000000
33      3       11211   0.000000        0.000000        0.000000        0.000000        0.010000
0.800000        1.640000        0.000000        1.000000        0.300000        0.000000        0.000000
33      3       11212   0.000000        0.000000        0.000000        0.000000        0.010000
0.800000        1.640000        0.000000        1.000000        0.300000        0.000000        0.000000
33      3       11221   0.000000        0.000000        0.000000        0.000000        0.010000
0.800000        1.640000        0.000000        1.000000        0.300000        0.000000        0.000000
33      3       11222   0.000000        0.000000        0.000000        0.000000        0.010000
0.800000        1.640000        0.000000        1.000000        0.300000        0.000000        0.000000
33      3       11311   0.000000        0.000000        0.000000        0.000000        0.010000
0.800000        1.640000        0.000000        1.000000        0.300000        0.000000        0.000000
33      3       11312   0.000000        0.000000        0.000000        0.000000        0.010000
0.800000        1.640000        0.000000        1.000000        0.300000        0.000000        0.000000
33      3       11321   0.000000        0.000000        0.000000        0.000000        0.010000
0.800000        1.640000        0.000000        1.000000        0.300000        0.000000        0.000000
33      3       11322   0.000000        0.000000        0.000000        0.000000        0.010000
0.800000        1.640000        0.000000        1.000000        0.300000        0.000000        0.000000
33      3       11411   0.000000        0.000000        0.000000        0.000000        0.010000
0.800000        1.640000        0.000000        1.000000        0.300000        0.000000        0.000000
33      3       11412   0.000000        0.000000        0.000000        0.000000        0.010000
0.800000        1.640000        0.000000        1.000000        0.300000        0.000000        0.000000
33      3       11421   0.000000        0.000000        0.000000        0.000000        0.010000
0.800000        1.640000        0.000000        1.000000        0.300000        0.000000        0.000000
33      3       11422   0.000000        0.000000        0.000000        0.000000        0.010000
0.800000        1.640000        0.000000        1.000000        0.300000        0.000000        0.000000
33      3       12111   0.000000        0.000000        0.000000        0.000000        0.010000
0.800000        1.640000        0.000000        1.000000        0.300000        0.000000        0.000000
33      3       12112   0.000000        0.000000        0.000000        0.000000        0.010000
0.800000        1.640000        0.000000        1.000000        0.300000        0.000000        0.000000
33      3       12121   0.000000        0.000000        0.000000        0.000000        0.010000
0.800000        1.640000        0.000000        1.000000        0.300000        0.000000        0.000000
33      3       12122   0.000000        0.000000        0.000000        0.000000        0.010000
0.800000        1.640000        0.000000        1.000000        0.300000        0.000000        0.000000
33      3       12211   0.000000        0.000000        0.000000        0.000000        0.010000
0.800000        1.640000        0.000000        1.000000        0.300000        0.000000        0.000000
33      3       12212   0.000000        0.000000        0.000000        0.000000        0.010000
0.800000        1.640000        0.000000        1.000000        0.300000        0.000000        0.000000
33      3       12221   0.000000        0.000000        0.000000        0.000000        0.010000
0.800000        1.640000        0.000000        1.000000        0.300000        0.000000        0.000000
33      3       12222   0.000000        0.000000        0.000000        0.000000        0.010000
0.800000        1.640000        0.000000        1.000000        0.300000        0.000000        0.000000
33      3       12311   0.000000        0.000000        0.000000        0.000000        0.010000
0.800000        1.640000        0.000000        1.000000        0.300000        0.000000        0.000000
33      3       12312   0.000000        0.000000        0.000000        0.000000        0.010000
0.800000        1.640000        0.000000        1.000000        0.300000        0.000000        0.000000
33      3       12321   0.000000        0.000000        0.000000        0.000000        0.010000
0.800000        1.640000        0.000000        1.000000        0.300000        0.000000        0.000000
33      3       12322   0.000000        0.000000        0.000000        0.000000        0.010000
0.800000        1.640000        0.000000        1.000000        0.300000        0.000000        0.000000
33      3       12411   0.000000        0.000000        0.000000        0.000000        0.010000
0.800000        1.640000        0.000000        1.000000        0.300000        0.000000        0.000000
33      3       12412   0.000000        0.000000        0.000000        0.000000        0.010000
0.800000        1.640000        0.000000        1.000000        0.300000        0.000000        0.000000
```

```
33      3       12421  0.000000       0.000000       0.000000       0.000000       0.010000
0.800000       1.640000       0.000000       1.000000       0.300000       0.000000       0.000000
33      3       12422  0.000000       0.000000       0.000000       0.000000       0.010000
0.800000       1.640000       0.000000       1.000000       0.300000       0.000000       0.000000
33      3       13111  0.000000       0.000000       0.000000       0.000000       1.500000
8.000000       1.640000       0.000000       1.000000       0.300000       0.000000       0.000000
33      3       13112  0.000000       0.000000       0.000000       0.000000       1.500000
8.000000       1.640000       0.000000       1.000000       0.300000       0.000000       0.000000
33      3       13121  0.000000       0.000000       0.000000       0.000000       1.500000
8.000000       1.640000       0.000000       1.000000       0.300000       0.000000       0.000000
33      3       13122  0.000000       0.000000       0.000000       0.000000       1.500000
8.000000       1.640000       0.000000       1.000000       0.300000       0.000000       0.000000
33      3       13211  0.000000       0.000000       0.000000       0.000000       1.500000
8.000000       1.640000       0.000000       1.000000       0.300000       0.000000       0.000000
33      3       13212  0.000000       0.000000       0.000000       0.000000       1.500000
8.000000       1.640000       0.000000       1.000000       0.300000       0.000000       0.000000
33      3       13221  0.000000       0.000000       0.000000       0.000000       1.500000
8.000000       1.640000       0.000000       1.000000       0.300000       0.000000       0.000000
33      3       13222  0.000000       0.000000       0.000000       0.000000       1.500000
8.000000       1.640000       0.000000       1.000000       0.300000       0.000000       0.000000
33      3       13231  0.000000       0.000000       0.000000       0.000000       1.500000
8.000000       1.640000       0.000000       1.000000       0.300000       0.000000       0.000000
33      3       13232  0.000000       0.000000       0.000000       0.000000       1.500000
8.000000       1.640000       0.000000       1.000000       0.300000       0.000000       0.000000
33      3       13311  0.000000       0.000000       0.000000       0.000000       1.500000
8.000000       1.640000       0.000000       1.000000       0.300000       0.000000       0.000000
33      3       13312  0.000000       0.000000       0.000000       0.000000       1.500000
8.000000       1.640000       0.000000       1.000000       0.300000       0.000000       0.000000
33      3       13321  0.000000       0.000000       0.000000       0.000000       1.500000
8.000000       1.640000       0.000000       1.000000       0.300000       0.000000       0.000000
33      3       13322  0.000000       0.000000       0.000000       0.000000       1.500000
8.000000       1.640000       0.000000       1.000000       0.300000       0.000000       0.000000
33      3       13331  0.000000       0.000000       0.000000       0.000000       1.500000
8.000000       1.640000       0.000000       1.000000       0.300000       0.000000       0.000000
33      3       13411  0.000000       0.000000       0.000000       0.000000       1.500000
8.000000       1.640000       0.000000       1.000000       0.300000       0.000000       0.000000
33      3       13412  0.000000       0.000000       0.000000       0.000000       1.500000
8.000000       1.640000       0.000000       1.000000       0.300000       0.000000       0.000000
33      3       13421  0.000000       0.000000       0.000000       0.000000       1.500000
8.000000       1.640000       0.000000       1.000000       0.300000       0.000000       0.000000
33      3       13422  0.000000       0.000000       0.000000       0.000000       1.500000
8.000000       1.640000       0.000000       1.000000       0.300000       0.000000       0.000000
33      3       13431  0.000000       0.000000       0.000000       0.000000       1.500000
8.000000       1.640000       0.000000       1.000000       0.300000       0.000000       0.000000
33      3       13432  0.000000       0.000000       0.000000       0.000000       1.500000
8.000000       1.640000       0.000000       1.000000       0.300000       0.000000       0.000000
33      3       14121  0.000000       0.000000       0.000000       0.000000       0.050000
0.500000       1.640000       0.000000       1.000000       0.300000       0.000000       0.000000
33      3       14122  0.000000       0.000000       0.000000       0.000000       0.050000
0.500000       1.640000       0.000000       1.000000       0.300000       0.000000       0.000000
33      3       14131  0.000000       0.000000       0.000000       0.000000       0.050000
0.500000       1.640000       0.000000       1.000000       0.300000       0.000000       0.000000
33      3       14132  0.000000       0.000000       0.000000       0.000000       0.050000
0.500000       1.640000       0.000000       1.000000       0.300000       0.000000       0.000000
33      3       14221  0.000000       0.000000       0.000000       0.000000       0.050000
0.500000       1.640000       0.000000       1.000000       0.300000       0.000000       0.000000
33      3       14222  0.000000       0.000000       0.000000       0.000000       0.050000
0.500000       1.640000       0.000000       1.000000       0.300000       0.000000       0.000000
33      3       14231  0.000000       0.000000       0.000000       0.000000       0.050000
0.500000       1.640000       0.000000       1.000000       0.300000       0.000000       0.000000
33      3       14232  0.000000       0.000000       0.000000       0.000000       0.050000
0.500000       1.640000       0.000000       1.000000       0.300000       0.000000       0.000000
33      3       14321  0.000000       0.000000       0.000000       0.000000       0.050000
0.500000       1.640000       0.000000       1.000000       0.300000       0.000000       0.000000
33      3       14322  0.000000       0.000000       0.000000       0.000000       0.050000
0.500000       1.640000       0.000000       1.000000       0.300000       0.000000       0.000000
33      3       14331  0.000000       0.000000       0.000000       0.000000       0.050000
0.500000       1.640000       0.000000       1.000000       0.300000       0.000000       0.000000
33      3       14332  0.000000       0.000000       0.000000       0.000000       0.050000
0.500000       1.640000       0.000000       1.000000       0.300000       0.000000       0.000000
33      3       14421  0.000000       0.000000       0.000000       0.000000       0.050000
0.500000       1.640000       0.000000       1.000000       0.300000       0.000000       0.000000
33      3       14422  0.000000       0.000000       0.000000       0.000000       0.050000
0.500000       1.640000       0.000000       1.000000       0.300000       0.000000       0.000000
33      3       14431  0.000000       0.000000       0.000000       0.000000       0.050000
0.500000       1.640000       0.000000       1.000000       0.300000       0.000000       0.000000
33      3       14432  0.000000       0.000000       0.000000       0.000000       0.050000
0.500000       1.640000       0.000000       1.000000       0.300000       0.000000       0.000000
```

```
33      3       15121   0.000000        0.000000        0.000000        0.000000        0.050000
0.500000        1.640000        0.000000        1.000000        0.300000        0.000000        0.000000
33      3       15122   0.000000        0.000000        0.000000        0.000000        0.050000
0.500000        1.640000        0.000000        1.000000        0.300000        0.000000        0.000000
33      3       15131   0.000000        0.000000        0.000000        0.000000        0.050000
0.500000        1.640000        0.000000        1.000000        0.300000        0.000000        0.000000
33      3       15132   0.000000        0.000000        0.000000        0.000000        0.050000
0.500000        1.640000        0.000000        1.000000        0.300000        0.000000        0.000000
33      3       15221   0.000000        0.000000        0.000000        0.000000        0.050000
0.500000        1.640000        0.000000        1.000000        0.300000        0.000000        0.000000
33      3       15222   0.000000        0.000000        0.000000        0.000000        0.050000
0.500000        1.640000        0.000000        1.000000        0.300000        0.000000        0.000000
33      3       15231   0.000000        0.000000        0.000000        0.000000        0.050000
0.500000        1.640000        0.000000        1.000000        0.300000        0.000000        0.000000
33      3       15232   0.000000        0.000000        0.000000        0.000000        0.050000
0.500000        1.640000        0.000000        1.000000        0.300000        0.000000        0.000000
33      3       15321   0.000000        0.000000        0.000000        0.000000        0.050000
0.500000        1.640000        0.000000        1.000000        0.300000        0.000000        0.000000
33      3       15322   0.000000        0.000000        0.000000        0.000000        0.050000
0.500000        1.640000        0.000000        1.000000        0.300000        0.000000        0.000000
33      3       15331   0.000000        0.000000        0.000000        0.000000        0.050000
0.500000        1.640000        0.000000        1.000000        0.300000        0.000000        0.000000
33      3       15332   0.000000        0.000000        0.000000        0.000000        0.050000
0.500000        1.640000        0.000000        1.000000        0.300000        0.000000        0.000000
33      3       15421   0.000000        0.000000        0.000000        0.000000        0.050000
0.500000        1.640000        0.000000        1.000000        0.300000        0.000000        0.000000
33      3       15422   0.000000        0.000000        0.000000        0.000000        0.050000
0.500000        1.640000        0.000000        1.000000        0.300000        0.000000        0.000000
33      3       15431   0.000000        0.000000        0.000000        0.000000        0.050000
0.500000        1.640000        0.000000        1.000000        0.300000        0.000000        0.000000
33      3       15432   0.000000        0.000000        0.000000        0.000000        0.050000
0.500000        1.640000        0.000000        1.000000        0.300000        0.000000        0.000000
33      3       16000   0.000000        0.000000        0.000000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
33      7       1000    0.000000        4.462500        4.462500        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
33      7       2000    0.000000        4.462500        4.462500        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
33      7       3000    0.000000        4.462500        4.462500        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
33      7       4000    0.000000        7.350000        7.350000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
33      7       5000    0.000000        6.825000        6.825000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
33      7       6000    0.000000        7.875000        7.875000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
33      7       7000    0.000000        7.350000        7.350000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
33      7       8000    0.000000        1.050000        1.050000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
33      7       9000    0.000000        1.050000        1.050000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
33      7       10000   0.000000        0.000000        0.000000        0.000000        0.000000
0.000001        1.640000        0.400000        0.000000        0.000000        0.000000        0.000000
33      7       11111   0.000000        2.000000        2.000000        0.000000        0.000000
0.000001        1.640000        0.000000        0.400000        0.200000        0.000000        0.000000
33      7       11112   0.000000        2.000000        2.000000        0.000000        0.000000
0.000001        1.640000        0.000000        0.400000        0.200000        0.000000        0.000000
33      7       11121   0.000000        2.000000        2.000000        0.000000        0.000000
0.000001        1.640000        0.000000        0.400000        0.200000        0.000000        0.000000
33      7       11122   0.000000        2.000000        2.000000        0.000000        0.000000
0.000001        1.640000        0.000000        0.400000        0.200000        0.000000        0.000000
33      7       11211   0.000000        2.000000        2.000000        0.000000        0.000000
0.000001        1.640000        0.000000        0.400000        0.200000        0.000000        0.000000
33      7       11212   0.000000        2.000000        2.000000        0.000000        0.000000
0.000001        1.640000        0.000000        0.400000        0.200000        0.000000        0.000000
33      7       11221   0.000000        2.000000        2.000000        0.000000        0.000000
0.000001        1.640000        0.000000        0.400000        0.200000        0.000000        0.000000
33      7       11222   0.000000        2.000000        2.000000        0.000000        0.000000
0.000001        1.640000        0.000000        0.400000        0.200000        0.000000        0.000000
33      7       11311   0.000000        2.000000        2.000000        0.000000        0.000000
0.000001        1.640000        0.000000        0.400000        0.200000        0.000000        0.000000
33      7       11312   0.000000        2.000000        2.000000        0.000000        0.000000
0.000001        1.640000        0.000000        0.400000        0.200000        0.000000        0.000000
33      7       11321   0.000000        2.000000        2.000000        0.000000        0.000000
0.000001        1.640000        0.000000        0.400000        0.200000        0.000000        0.000000
33      7       11322   0.000000        2.000000        2.000000        0.000000        0.000000
0.000001        1.640000        0.000000        0.400000        0.200000        0.000000        0.000000
```

```
33      7       11411   0.000000        2.000000        2.000000        0.000000        0.000000
0.000001        1.640000        0.000000        0.400000        0.200000        0.000000        0.000000
33      7       11412   0.000000        2.000000        2.000000        0.000000        0.000000
0.000001        1.640000        0.000000        0.400000        0.200000        0.000000        0.000000
33      7       11421   0.000000        2.000000        2.000000        0.000000        0.000000
0.000001        1.640000        0.000000        0.400000        0.200000        0.000000        0.000000
33      7       11422   0.000000        2.000000        2.000000        0.000000        0.000000
0.000001        1.640000        0.000000        0.400000        0.200000        0.000000        0.000000
33      7       12111   0.000000        2.000000        2.000000        0.000000        0.000000
0.000001        1.640000        0.000000        0.400000        0.200000        0.000000        0.000000
33      7       12112   0.000000        2.000000        2.000000        0.000000        0.000000
0.000001        1.640000        0.000000        0.400000        0.200000        0.000000        0.000000
33      7       12121   0.000000        2.000000        2.000000        0.000000        0.000000
0.000001        1.640000        0.000000        0.400000        0.200000        0.000000        0.000000
33      7       12122   0.000000        2.000000        2.000000        0.000000        0.000000
0.000001        1.640000        0.000000        0.400000        0.200000        0.000000        0.000000
33      7       12211   0.000000        2.000000        2.000000        0.000000        0.000000
0.000001        1.640000        0.000000        0.400000        0.200000        0.000000        0.000000
33      7       12212   0.000000        2.000000        2.000000        0.000000        0.000000
0.000001        1.640000        0.000000        0.400000        0.200000        0.000000        0.000000
33      7       12221   0.000000        2.000000        2.000000        0.000000        0.000000
0.000001        1.640000        0.000000        0.400000        0.200000        0.000000        0.000000
33      7       12222   0.000000        2.000000        2.000000        0.000000        0.000000
0.000001        1.640000        0.000000        0.400000        0.200000        0.000000        0.000000
33      7       12311   0.000000        2.000000        2.000000        0.000000        0.000000
0.000001        1.640000        0.000000        0.400000        0.200000        0.000000        0.000000
33      7       12312   0.000000        2.000000        2.000000        0.000000        0.000000
0.000001        1.640000        0.000000        0.400000        0.200000        0.000000        0.000000
33      7       12321   0.000000        2.000000        2.000000        0.000000        0.000000
0.000001        1.640000        0.000000        0.400000        0.200000        0.000000        0.000000
33      7       12322   0.000000        2.000000        2.000000        0.000000        0.000000
0.000001        1.640000        0.000000        0.400000        0.200000        0.000000        0.000000
33      7       12411   0.000000        2.000000        2.000000        0.000000        0.000000
0.000001        1.640000        0.000000        0.400000        0.200000        0.000000        0.000000
33      7       12412   0.000000        2.000000        2.000000        0.000000        0.000000
0.000001        1.640000        0.000000        0.400000        0.200000        0.000000        0.000000
33      7       12421   0.000000        2.000000        2.000000        0.000000        0.000000
0.000001        1.640000        0.000000        0.400000        0.200000        0.000000        0.000000
33      7       12422   0.000000        2.000000        2.000000        0.000000        0.000000
0.000001        1.640000        0.000000        0.400000        0.200000        0.000000        0.000000
33      7       13111   0.000000        8.000000        8.000000        0.000000        0.000000
0.000001        1.640000        0.000000        1.200000        0.600000        0.000000        0.000000
33      7       13112   0.000000        8.000000        8.000000        0.000000        0.000000
0.000001        1.640000        0.000000        1.200000        0.600000        0.000000        0.000000
33      7       13121   0.000000        8.000000        8.000000        0.000000        0.000000
0.000001        1.640000        0.000000        1.200000        0.600000        0.000000        0.000000
33      7       13122   0.000000        8.000000        8.000000        0.000000        0.000000
0.000001        1.640000        0.000000        1.200000        0.600000        0.000000        0.000000
33      7       13211   0.000000        8.000000        8.000000        0.000000        0.000000
0.000001        1.640000        0.000000        1.200000        0.600000        0.000000        0.000000
33      7       13212   0.000000        8.000000        8.000000        0.000000        0.000000
0.000001        1.640000        0.000000        1.200000        0.600000        0.000000        0.000000
33      7       13221   0.000000        8.000000        8.000000        0.000000        0.000000
0.000001        1.640000        0.000000        1.200000        0.600000        0.000000        0.000000
33      7       13222   0.000000        8.000000        8.000000        0.000000        0.000000
0.000001        1.640000        0.000000        1.200000        0.600000        0.000000        0.000000
33      7       13231   0.000000        8.000000        8.000000        0.000000        0.000000
0.000001        1.640000        0.000000        1.200000        0.600000        0.000000        0.000000
33      7       13232   0.000000        8.000000        8.000000        0.000000        0.000000
0.000001        1.640000        0.000000        1.200000        0.600000        0.000000        0.000000
33      7       13311   0.000000        8.000000        8.000000        0.000000        0.000000
0.000001        1.640000        0.000000        1.200000        0.600000        0.000000        0.000000
33      7       13312   0.000000        8.000000        8.000000        0.000000        0.000000
0.000001        1.640000        0.000000        1.200000        0.600000        0.000000        0.000000
33      7       13321   0.000000        8.000000        8.000000        0.000000        0.000000
0.000001        1.640000        0.000000        1.200000        0.600000        0.000000        0.000000
33      7       13322   0.000000        8.000000        8.000000        0.000000        0.000000
0.000001        1.640000        0.000000        1.200000        0.600000        0.000000        0.000000
33      7       13331   0.000000        8.000000        8.000000        0.000000        0.000000
0.000001        1.640000        0.000000        1.200000        0.600000        0.000000        0.000000
33      7       13411   0.000000        8.000000        8.000000        0.000000        0.000000
0.000001        1.640000        0.000000        1.200000        0.600000        0.000000        0.000000
33      7       13412   0.000000        8.000000        8.000000        0.000000        0.000000
0.000001        1.640000        0.000000        1.200000        0.600000        0.000000        0.000000
33      7       13421   0.000000        8.000000        8.000000        0.000000        0.000000
0.000001        1.640000        0.000000        1.200000        0.600000        0.000000        0.000000
33      7       13422   0.000000        8.000000        8.000000        0.000000        0.000000
0.000001        1.640000        0.000000        1.200000        0.600000        0.000000        0.000000
```

```
33      7       13431   0.000000        8.000000        8.000000        0.000000        0.000000
0.000001        1.640000        0.000000        1.200000        0.600000        0.000000        0.000000
33      7       13432   0.000000        8.000000        8.000000        0.000000        0.000000
0.000001        1.640000        0.000000        1.200000        0.600000        0.000000        0.000000
33      7       14121   0.000000        2.000000        2.000000        0.000000        0.000000
0.000001        1.640000        0.000000        0.200000        0.200000        0.000000        0.000000
33      7       14122   0.000000        2.000000        2.000000        0.000000        0.000000
0.000001        1.640000        0.000000        0.200000        0.200000        0.000000        0.000000
33      7       14131   0.000000        2.000000        2.000000        0.000000        0.000000
0.000001        1.640000        0.000000        0.200000        0.200000        0.000000        0.000000
33      7       14132   0.000000        2.000000        2.000000        0.000000        0.000000
0.000001        1.640000        0.000000        0.200000        0.200000        0.000000        0.000000
33      7       14221   0.000000        2.000000        2.000000        0.000000        0.000000
0.000001        1.640000        0.000000        0.200000        0.200000        0.000000        0.000000
33      7       14222   0.000000        2.000000        2.000000        0.000000        0.000000
0.000001        1.640000        0.000000        0.200000        0.200000        0.000000        0.000000
33      7       14231   0.000000        2.000000        2.000000        0.000000        0.000000
0.000001        1.640000        0.000000        0.200000        0.200000        0.000000        0.000000
33      7       14232   0.000000        2.000000        2.000000        0.000000        0.000000
0.000001        1.640000        0.000000        0.200000        0.200000        0.000000        0.000000
33      7       14321   0.000000        2.000000        2.000000        0.000000        0.000000
0.000001        1.640000        0.000000        0.200000        0.200000        0.000000        0.000000
33      7       14322   0.000000        2.000000        2.000000        0.000000        0.000000
0.000001        1.640000        0.000000        0.200000        0.200000        0.000000        0.000000
33      7       14331   0.000000        2.000000        2.000000        0.000000        0.000000
0.000001        1.640000        0.000000        0.200000        0.200000        0.000000        0.000000
33      7       14332   0.000000        2.000000         2.000000        0.000000        0.000000
0.000001        1.640000        0.000000        0.200000        0.200000        0.000000        0.000000
33      7       14421   0.000000        2.000000        2.000000        0.000000        0.000000
0.000001        1.640000        0.000000        0.200000        0.200000        0.000000        0.000000
33      7       14422   0.000000        2.000000        2.000000        0.000000        0.000000
0.000001        1.640000        0.000000        0.200000        0.200000        0.000000        0.000000
33      7       14431   0.000000        2.000000        2.000000        0.000000        0.000000
0.000001        1.640000        0.000000        0.200000        0.200000        0.000000        0.000000
33      7       14432   0.000000        2.000000        2.000000        0.000000        0.000000
0.000001        1.640000        0.000000        0.200000        0.200000        0.000000        0.000000
33      7       15121   0.000000        2.000000        2.000000        0.000000        0.000000
0.000001        1.640000        0.000000        0.200000        0.200000        0.000000        0.000000
33      7       15122   0.000000        2.000000        2.000000        0.000000        0.000000
0.000001        1.640000        0.000000        0.200000        0.200000        0.000000        0.000000
33      7       15131   0.000000        2.000000        2.000000        0.000000        0.000000
0.000001        1.640000        0.000000        0.200000        0.200000        0.000000        0.000000
33      7       15132   0.000000        2.000000        2.000000        0.000000        0.000000
0.000001        1.640000        0.000000        0.200000        0.200000        0.000000        0.000000
33      7       15221   0.000000        2.000000        2.000000        0.000000        0.000000
0.000001        1.640000        0.000000        0.200000        0.200000        0.000000        0.000000
33      7       15222   0.000000        2.000000        2.000000        0.000000        0.000000
0.000001        1.640000        0.000000        0.200000        0.200000        0.000000        0.000000
33      7       15231   0.000000        2.000000        2.000000        0.000000        0.000000
0.000001        1.640000        0.000000        0.200000        0.200000        0.000000        0.000000
33      7       15232   0.000000        2.000000        2.000000        0.000000        0.000000
0.000001        1.640000        0.000000        0.200000        0.200000        0.000000        0.000000
33      7       15321   0.000000        2.000000        2.000000        0.000000        0.000000
0.000001        1.640000        0.000000        0.200000        0.200000        0.000000        0.000000
33      7       15322   0.000000        2.000000         2.000000        0.000000        0.000000
0.000001        1.640000        0.000000        0.200000        0.200000        0.000000        0.000000
33      7       15331   0.000000        2.000000        2.000000        0.000000        0.000000
0.000001        1.640000        0.000000        0.200000        0.200000        0.000000        0.000000
33      7       15332   0.000000        2.000000        2.000000        0.000000        0.000000
0.000001        1.640000        0.000000        0.200000        0.200000        0.000000        0.000000
33      7       15421   0.000000        2.000000        2.000000        0.000000        0.000000
0.000001        1.640000        0.000000        0.200000        0.200000        0.000000        0.000000
33      7       15422   0.000000        2.000000        2.000000        0.000000        0.000000
0.000001        1.640000        0.000000        0.200000        0.200000        0.000000        0.000000
33      7       15431   0.000000        2.000000        2.000000        0.000000        0.000000
0.000001        1.640000        0.000000        0.200000        0.200000        0.000000        0.000000
33      7       15432   0.000000        2.000000        2.000000        0.000000        0.000000
0.000001        1.640000        0.000000        0.200000        0.200000        0.000000        0.000000
33      7       16000   0.000000        0.000000        0.000000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
33      10      1000    0.000000        0.017500        0.017500        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
33      10      2000    0.000000        0.015000        0.015000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
33      10      3000    0.000000        0.012000        0.012000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
33      10      4000    0.000000        0.015000        0.015000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
```

```
33      10    5000    0.000000       0.007500       0.007500       0.000000       0.000000
0.000001      1.640000        0.000000       0.000000       0.000000       0.000000       0.000000
33      10    6000    0.000000       0.020000       0.020000       0.000000       0.000000
0.000001      1.640000        0.000000       0.000000       0.000000       0.000000       0.000000
33      10    7000    0.000000       0.025000       0.025000       0.000000       0.000000
0.000001      1.640000        0.000000       0.000000       0.000000       0.000000       0.000000
33      10    8000    0.000000       0.011250       0.011250       0.000000       0.000000
0.000001      1.640000        0.000000       0.000000       0.000000       0.000000       0.000000
33      10    9000    0.000000       0.003750       0.003750       0.000000       0.000000
0.000001      1.640000        0.000000       0.000000       0.000000       0.000000       0.000000
33      10    10000   0.000000       0.000000       0.000000       0.000000       0.000000
0.000001      1.640000        0.100000       0.000000       0.000000       0.000000       0.000000
33      10    11111   0.000000       0.005000       0.005000       0.000000       0.000000
0.000001      1.640000        0.000000       0.000000       0.000000       0.000000       0.000000
33      10    11112   0.000000       0.005000       0.005000       0.000000       0.000000
0.000001      1.640000        0.000000       0.000000       0.000000       0.000000       0.000000
33      10    11121   0.000000       0.005000       0.005000       0.000000       0.000000
0.000001      1.640000        0.000000       0.000000       0.000000       0.000000       0.000000
33      10    11122   0.000000       0.005000       0.005000       0.000000       0.000000
0.000001      1.640000        0.000000       0.000000       0.000000       0.000000       0.000000
33      10    11211   0.000000       0.005000       0.005000       0.000000       0.000000
0.000001      1.640000        0.000000       0.000000       0.000000       0.000000       0.000000
33      10    11212   0.000000       0.005000       0.005000       0.000000       0.000000
0.000001      1.640000        0.000000       0.000000       0.000000       0.000000       0.000000
33      10    11221   0.000000       0.005000       0.005000       0.000000       0.000000
0.000001      1.640000        0.000000       0.000000       0.000000       0.000000       0.000000
33      10    11222   0.000000       0.005000       0.005000       0.000000       0.000000
0.000001      1.640000        0.000000       0.000000       0.000000       0.000000       0.000000
33      10    11311   0.000000       0.005000       0.005000       0.000000       0.000000
0.000001      1.640000        0.000000       0.000000       0.000000       0.000000       0.000000
33      10    11312   0.000000       0.005000       0.005000       0.000000       0.000000
0.000001      1.640000        0.000000       0.000000       0.000000       0.000000       0.000000
33      10    11321   0.000000       0.005000       0.005000       0.000000       0.000000
0.000001      1.640000        0.000000       0.000000       0.000000       0.000000       0.000000
33      10    11322   0.000000       0.005000       0.005000       0.000000       0.000000
0.000001      1.640000        0.000000       0.000000       0.000000       0.000000       0.000000
33      10    11411   0.000000       0.005000       0.005000       0.000000       0.000000
0.000001      1.640000        0.000000       0.000000       0.000000       0.000000       0.000000
33      10    11412   0.000000       0.005000       0.005000       0.000000       0.000000
0.000001      1.640000        0.000000       0.000000       0.000000       0.000000       0.000000
33      10    11421   0.000000       0.005000       0.005000       0.000000       0.000000
0.000001      1.640000        0.000000       0.000000       0.000000       0.000000       0.000000
33      10    11422   0.000000       0.005000       0.005000       0.000000       0.000000
0.000001      1.640000        0.000000       0.000000       0.000000       0.000000       0.000000
33      10    12111   0.000000       0.005000       0.005000       0.000000       0.000000
0.000001      1.640000        0.000000       0.000000       0.000000       0.000000       0.000000
33      10    12112   0.000000       0.005000       0.005000       0.000000       0.000000
0.000001      1.640000        0.000000       0.000000       0.000000       0.000000       0.000000
33      10    12121   0.000000       0.005000       0.005000       0.000000       0.000000
0.000001      1.640000        0.000000       0.000000       0.000000       0.000000       0.000000
33      10    12122   0.000000       0.005000       0.005000       0.000000       0.000000
0.000001      1.640000        0.000000       0.000000       0.000000       0.000000       0.000000
33      10    12211   0.000000       0.005000       0.005000       0.000000       0.000000
0.000001      1.640000        0.000000       0.000000       0.000000       0.000000       0.000000
33      10    12212   0.000000       0.005000       0.005000       0.000000       0.000000
0.000001      1.640000        0.000000       0.000000       0.000000       0.000000       0.000000
33      10    12221   0.000000       0.005000       0.005000       0.000000       0.000000
0.000001      1.640000        0.000000       0.000000       0.000000       0.000000       0.000000
33      10    12222   0.000000       0.005000       0.005000       0.000000       0.000000
0.000001      1.640000        0.000000       0.000000       0.000000       0.000000       0.000000
33      10    12311   0.000000       0.005000       0.005000       0.000000       0.000000
0.000001      1.640000        0.000000       0.000000       0.000000       0.000000       0.000000
33      10    12312   0.000000       0.005000       0.005000       0.000000       0.000000
0.000001      1.640000        0.000000       0.000000       0.000000       0.000000       0.000000
33      10    12321   0.000000       0.005000       0.005000       0.000000       0.000000
0.000001      1.640000        0.000000       0.000000       0.000000       0.000000       0.000000
33      10    12322   0.000000       0.005000       0.005000       0.000000       0.000000
0.000001      1.640000        0.000000       0.000000       0.000000       0.000000       0.000000
33      10    12411   0.000000       0.005000       0.005000       0.000000       0.000000
0.000001      1.640000        0.000000       0.000000       0.000000       0.000000       0.000000
33      10    12412   0.000000       0.005000       0.005000       0.000000       0.000000
0.000001      1.640000        0.000000       0.000000       0.000000       0.000000       0.000000
33      10    12421   0.000000       0.005000       0.005000       0.000000       0.000000
0.000001      1.640000        0.000000       0.000000       0.000000       0.000000       0.000000
33      10    12422   0.000000       0.005000       0.005000       0.000000       0.000000
0.000001      1.640000        0.000000       0.000000       0.000000       0.000000       0.000000
33      10    13111   0.000000       0.001000       0.001000       0.000000       0.000000
0.000001      1.640000        0.000000       0.000000       0.000000       0.000000       0.000000
```

```
33      10      13112   0.000000        0.001000        0.001000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
33      10      13121   0.000000        0.001000        0.001000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
33      10      13122   0.000000        0.001000        0.001000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
33      10      13211   0.000000        0.001000        0.001000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
33      10      13212   0.000000        0.001000        0.001000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
33      10      13221   0.000000        0.001000        0.001000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
33      10      13222   0.000000        0.001000        0.001000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
33      10      13231   0.000000        0.001000        0.001000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
33      10      13232   0.000000        0.001000        0.001000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
33      10      13311   0.000000        0.001000        0.001000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
33      10      13312   0.000000        0.001000        0.001000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
33      10      13321   0.000000        0.001000        0.001000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
33      10      13322   0.000000        0.001000        0.001000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
33      10      13331   0.000000        0.001000        0.001000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
33      10      13411   0.000000        0.001000        0.001000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
33      10      13412   0.000000        0.001000        0.001000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
33      10      13421   0.000000        0.001000        0.001000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
33      10      13422   0.000000        0.001000        0.001000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
33      10      13431   0.000000        0.001000        0.001000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
33      10      13432   0.000000        0.001000        0.001000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
33      10      14121   0.000000        0.001000        0.001000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
33      10      14122   0.000000        0.001000        0.001000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
33      10      14131   0.000000        0.001000        0.001000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
33      10      14132   0.000000        0.001000        0.001000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
33      10      14221   0.000000        0.001000        0.001000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
33      10      14222   0.000000        0.001000        0.001000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
33      10      14231   0.000000        0.001000        0.001000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
33      10      14232   0.000000        0.001000        0.001000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
33      10      14321   0.000000        0.001000        0.001000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
33      10      14322   0.000000        0.001000        0.001000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
33      10      14331   0.000000        0.001000        0.001000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
33      10      14332   0.000000        0.001000        0.001000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
33      10      14421   0.000000        0.001000        0.001000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
33      10      14422   0.000000        0.001000        0.001000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
33      10      14431   0.000000        0.001000        0.001000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
33      10      14432   0.000000        0.001000        0.001000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
33      10      15121   0.000000        0.001000        0.001000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
33      10      15122   0.000000        0.001000        0.001000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
33      10      15131   0.000000        0.001000        0.001000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
```

```
33      10      15132   0.000000        0.001000        0.001000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
33      10      15221   0.000000        0.001000        0.001000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
33      10      15222   0.000000        0.001000        0.001000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
33      10      15231   0.000000        0.001000        0.001000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
33      10      15232   0.000000        0.001000        0.001000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
33      10      15321   0.000000        0.001000        0.001000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
33      10      15322   0.000000        0.001000        0.001000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
33      10      15331   0.000000        0.001000        0.001000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
33      10      15332   0.000000        0.001000        0.001000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
33      10      15421   0.000000        0.001000        0.001000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
33      10      15422   0.000000        0.001000        0.001000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
33      10      15431   0.000000        0.001000        0.001000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
33      10      15432   0.000000        0.001000        0.001000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
33      10      16000   0.000000        0.000000        0.000000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
33      11      1000    0.000000        1.750000        1.750000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
33      11      2000    0.000000        1.500000        1.500000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
33      11      3000    0.000000        1.200000        1.200000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
33      11      4000    0.000000        1.500000        1.500000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
33      11      5000    0.000000        0.750000        0.750000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
33      11      6000    0.000000        2.000000        2.000000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
33      11      7000    0.000000        2.500000        2.500000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
33      11      8000    0.000000        1.125000        1.125000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
33      11      9000    0.000000        0.375000        0.375000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
33      11      10000   0.000000        0.000000        0.000000        0.000000        0.000000
0.000001        1.640000        25.000000       0.000000        0.000000        0.000000        0.000000
33      11      11111   0.000000        0.500000        0.500000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
33      11      11112   0.000000        0.500000        0.500000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
33      11      11121   0.000000        0.500000        0.500000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
33      11      11122   0.000000        0.500000        0.500000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
33      11      11211   0.000000        0.500000        0.500000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
33      11      11212   0.000000        0.500000        0.500000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
33      11      11221   0.000000        0.500000        0.500000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
33      11      11222   0.000000        0.500000        0.500000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
33      11      11311   0.000000        0.500000        0.500000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
33      11      11312   0.000000        0.500000        0.500000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
33      11      11321   0.000000        0.500000        0.500000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
33      11      11322   0.000000        0.500000        0.500000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
33      11      11411   0.000000        0.500000        0.500000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
33      11      11412   0.000000        0.500000        0.500000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
33      11      11421   0.000000        0.500000        0.500000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
```

```
33       11    11422  0.000000       0.500000       0.500000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33       11    12111  0.000000       0.500000       0.030000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33       11    12112  0.000000       0.500000       0.030000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33       11    12121  0.000000       0.500000       0.030000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33       11    12122  0.000000       0.500000       0.030000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33       11    12211  0.000000       0.500000       0.030000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33       11    12212  0.000000       0.500000       0.030000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33       11    12221  0.000000       0.500000       0.030000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33       11    12222  0.000000       0.500000       0.030000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33       11    12311  0.000000       0.500000       0.030000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33       11    12312  0.000000       0.500000       0.030000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33       11    12321  0.000000       0.500000       0.030000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33       11    12322  0.000000       0.500000       0.030000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33       11    12411  0.000000       0.500000       0.030000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33       11    12412  0.000000       0.500000       0.030000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33       11    12421  0.000000       0.500000       0.030000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33       11    12422  0.000000       0.500000       0.030000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33       11    13111  0.000000       0.100000       0.100000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33       11    13112  0.000000       0.100000       0.100000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33       11    13121  0.000000       0.100000       0.100000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33       11    13122  0.000000       0.100000       0.100000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33       11    13211  0.000000       0.100000       0.100000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33       11    13212  0.000000       0.100000       0.100000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33       11    13221  0.000000       0.100000       0.100000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33       11    13222  0.000000       0.100000       0.100000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33       11    13231  0.000000       0.100000       0.100000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33       11    13232  0.000000       0.100000       0.100000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33       11    13311  0.000000       0.100000       0.100000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33       11    13312  0.000000       0.100000       0.100000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33       11    13321  0.000000       0.100000       0.100000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33       11    13322  0.000000       0.100000       0.100000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33       11    13331  0.000000       0.100000       0.100000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33       11    13411  0.000000       0.100000       0.100000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33       11    13412  0.000000       0.100000       0.100000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33       11    13421  0.000000       0.100000       0.100000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33       11    13422  0.000000       0.100000       0.100000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33       11    13431  0.000000       0.100000       0.100000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33       11    13432  0.000000       0.100000       0.100000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33       11    14121  0.000000       0.100000       0.100000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
```

```
33      11      14122   0.000000        0.100000        0.100000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
33      11      14131   0.000000        0.100000        0.100000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
33      11      14132   0.000000        0.100000        0.100000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
33      11      14221   0.000000        0.100000        0.100000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
33      11      14222   0.000000        0.100000        0.100000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
33      11      14231   0.000000        0.100000        0.100000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
33      11      14232   0.000000        0.100000        0.100000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
33      11      14321   0.000000        0.100000        0.100000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
33      11      14322   0.000000        0.100000        0.100000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
33      11      14331   0.000000        0.100000        0.100000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
33      11      14332   0.000000        0.100000        0.100000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
33      11      14421   0.000000        0.100000        0.100000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
33      11      14422   0.000000        0.100000        0.100000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
33      11      14431   0.000000        0.100000        0.100000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
33      11      14432   0.000000        0.100000        0.100000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
33      11      15121   0.000000        0.100000        0.100000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
33      11      15122   0.000000        0.100000        0.100000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
33      11      15131   0.000000        0.100000        0.100000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
33      11      15132   0.000000        0.100000        0.100000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
33      11      15221   0.000000        0.100000        0.100000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
33      11      15222   0.000000        0.100000        0.100000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
33      11      15231   0.000000        0.100000        0.100000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
33      11      15232   0.000000        0.100000        0.100000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
33      11      15321   0.000000        0.100000        0.100000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
33      11      15322   0.000000        0.100000        0.100000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
33      11      15331   0.000000        0.100000        0.100000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
33      11      15332   0.000000        0.100000        0.100000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
33      11      15421   0.000000        0.100000        0.100000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
33      11      15422   0.000000        0.100000        0.100000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
33      11      15431   0.000000        0.100000        0.100000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
33      11      15432   0.000000        0.100000        0.100000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
33      11      16000   0.000000        0.000000        0.000000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
33      12      1000    0.000000        0.432000        0.432000        0.000000        0.000000
0.000001        1.640000        50.000000       0.000000        0.000000        0.000000        0.000000
33      12      2000    0.000000        0.324000        0.324000        0.000000        0.000000
0.000001        1.640000        50.000000       0.000000        0.000000        0.000000        0.000000
33      12      3000    0.000000        0.108000        0.108000        0.000000        0.000000
0.000001        1.640000        50.000000       0.000000        0.000000        0.000000        0.000000
33      12      4000    0.000000        0.432000        0.432000        0.000000        0.000000
0.000001        1.640000        50.000000       0.000000        0.000000        0.000000        0.000000
33      12      5000    0.000000        0.378000        0.378000        0.000000        0.000000
0.000001        1.640000        50.000000       0.000000        0.000000        0.000000        0.000000
33      12      6000    0.000000        0.518400        0.518400        0.000000        0.000000
0.000001        1.640000        50.000000       0.000000        0.000000        0.000000        0.000000
33      12      7000    0.000000        0.691200        0.691200        0.000000        0.000000
0.000001        1.640000        50.000000       0.000000        0.000000        0.000000        0.000000
```

```
33      12      8000    0.000000        0.270000        0.270000        0.000000        0.000000
0.000001        1.640000        50.000000       0.000000        0.000000        0.000000        0.000000
33      12      9000    0.000000        0.090000        0.090000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
33      12      10000   0.000000        0.000000        0.000000        0.000000        0.000000
0.000001        1.640000        4.000000        0.000000        0.000000        0.000000        0.000000
33      12      11111   0.000000        0.010000        0.010000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
33      12      11112   0.000000        0.010000        0.010000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
33      12      11121   0.000000        0.010000        0.010000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
33      12      11122   0.000000        0.010000        0.010000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
33      12      11211   0.000000        0.010000        0.010000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
33      12      11212   0.000000        0.010000        0.010000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
33      12      11221   0.000000        0.010000        0.010000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
33      12      11222   0.000000        0.010000        0.010000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
33      12      11311   0.000000        0.010000        0.010000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
33      12      11312   0.000000        0.010000        0.010000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
33      12      11321   0.000000        0.010000        0.010000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
33      12      11322   0.000000        0.010000        0.010000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
33      12      11411   0.000000        0.010000        0.010000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
33      12      11412   0.000000        0.010000        0.010000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
33      12      11421   0.000000        0.010000        0.010000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
33      12      11422   0.000000        0.010000        0.010000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
33      12      12111   0.000000        0.010000        0.010000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
33      12      12112   0.000000        0.010000        0.010000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
33      12      12121   0.000000        0.010000        0.010000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
33      12      12122   0.000000        0.010000        0.010000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
33      12      12211   0.000000        0.010000        0.010000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
33      12      12212   0.000000        0.010000        0.010000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
33      12      12221   0.000000        0.010000        0.010000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
33      12      12222   0.000000        0.010000        0.010000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
33      12      12311   0.000000        0.010000        0.010000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
33      12      12312   0.000000        0.010000        0.010000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
33      12      12321   0.000000        0.010000        0.010000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
33      12      12322   0.000000        0.010000        0.010000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
33      12      12411   0.000000        0.010000        0.010000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
33      12      12412   0.000000        0.010000        0.010000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
33      12      12421   0.000000        0.010000        0.010000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
33      12      12422   0.000000        0.010000        0.010000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
33      12      13111   0.000000        0.010000        0.010000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
33      12      13112   0.000000        0.010000        0.010000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
33      12      13121   0.000000        0.010000        0.010000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
33      12      13122   0.000000        0.010000        0.010000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
```

```
33      12      13211  0.000000       0.010000       0.010000       0.000000       0.000000
0.000001        1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33      12      13212  0.000000       0.010000       0.010000       0.000000       0.000000
0.000001        1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33      12      13221  0.000000       0.010000       0.010000       0.000000       0.000000
0.000001        1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33      12      13222  0.000000       0.010000       0.010000       0.000000       0.000000
0.000001        1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33      12      13231  0.000000       0.010000       0.010000       0.000000       0.000000
0.000001        1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33      12      13232  0.000000       0.010000       0.010000       0.000000       0.000000
0.000001        1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33      12      13311  0.000000       0.010000       0.010000       0.000000       0.000000
0.000001        1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33      12      13312  0.000000       0.010000       0.010000       0.000000       0.000000
0.000001        1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33      12      13321  0.000000       0.010000       0.010000       0.000000       0.000000
0.000001        1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33      12      13322  0.000000       0.010000       0.010000       0.000000       0.000000
0.000001        1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33      12      13331  0.000000       0.010000       0.010000       0.000000       0.000000
0.000001        1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33      12      13411  0.000000       0.010000       0.010000       0.000000       0.000000
0.000001        1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33      12      13412  0.000000       0.010000       0.010000       0.000000       0.000000
0.000001        1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33      12      13421  0.000000       0.010000       0.010000       0.000000       0.000000
0.000001        1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33      12      13422  0.000000       0.010000       0.010000       0.000000       0.000000
0.000001        1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33      12      13431  0.000000       0.010000       0.010000       0.000000       0.000000
0.000001        1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33      12      13432  0.000000       0.010000       0.010000       0.000000       0.000000
0.000001        1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33      12      14121  0.000000       0.010000       0.010000       0.000000       0.000000
0.000001        1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33      12      14122  0.000000       0.010000       0.010000       0.000000       0.000000
0.000001        1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33      12      14131  0.000000       0.010000       0.010000       0.000000       0.000000
0.000001        1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33      12      14132  0.000000       0.010000       0.010000       0.000000       0.000000
0.000001        1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33      12      14221  0.000000       0.010000       0.010000       0.000000       0.000000
0.000001        1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33      12      14222  0.000000       0.010000       0.010000       0.000000       0.000000
0.000001        1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33      12      14231  0.000000       0.010000       0.010000       0.000000       0.000000
0.000001        1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33      12      14232  0.000000       0.010000       0.010000       0.000000       0.000000
0.000001        1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33      12      14321  0.000000       0.010000       0.010000       0.000000       0.000000
0.000001        1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33      12      14322  0.000000       0.010000       0.010000       0.000000       0.000000
0.000001        1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33      12      14331  0.000000       0.010000       0.010000       0.000000       0.000000
0.000001        1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33      12      14332  0.000000       0.010000       0.010000       0.000000       0.000000
0.000001        1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33      12      14421  0.000000       0.010000       0.010000       0.000000       0.000000
0.000001        1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33      12      14422  0.000000       0.010000       0.010000       0.000000       0.000000
0.000001        1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33      12      14431  0.000000       0.010000       0.010000       0.000000       0.000000
0.000001        1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33      12      14432  0.000000       0.010000       0.010000       0.000000       0.000000
0.000001        1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33      12      15121  0.000000       0.010000       0.010000       0.000000       0.000000
0.000001        1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33      12      15122  0.000000       0.010000       0.010000       0.000000       0.000000
0.000001        1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33      12      15131  0.000000       0.010000       0.010000       0.000000       0.000000
0.000001        1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33      12      15132  0.000000       0.010000       0.010000       0.000000       0.000000
0.000001        1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33      12      15221  0.000000       0.010000       0.010000       0.000000       0.000000
0.000001        1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33      12      15222  0.000000       0.010000       0.010000       0.000000       0.000000
0.000001        1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
```

```
33      12      15231  0.000000       0.010000       0.010000       0.000000       0.000000
0.000001        1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33      12      15232  0.000000       0.010000       0.010000       0.000000       0.000000
0.000001        1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33      12      15321  0.000000       0.010000       0.010000       0.000000       0.000000
0.000001        1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33      12      15322  0.000000       0.010000       0.010000       0.000000       0.000000
0.000001        1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33      12      15331  0.000000       0.010000       0.010000       0.000000       0.000000
0.000001        1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33      12      15332  0.000000       0.010000       0.010000       0.000000       0.000000
0.000001        1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33      12      15421  0.000000       0.010000       0.010000       0.000000       0.000000
0.000001        1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33      12      15422  0.000000       0.010000       0.010000       0.000000       0.000000
0.000001        1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33      12      15431  0.000000       0.010000       0.010000       0.000000       0.000000
0.000001        1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33      12      15432  0.000000       0.010000       0.010000       0.000000       0.000000
0.000001        1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33      12      16000  0.000000       0.000000       0.000000       0.000000       0.000000
0.000001        1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33      14      1000   0.000000       13.824000      13.824000      0.000000       0.000000
0.000001        1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33      14      2000   0.000000       6.912000       6.912000       0.000000       0.000000
0.000001        1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33      14      3000   0.000000       5.184000       5.184000       0.000000       0.000000
0.000001        1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33      14      4000   0.000000       4.500000       4.500000       0.000000       0.000000
0.000001        1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33      14      5000   0.000000       2.700000       2.700000       0.000000       0.000000
0.000001        1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33      14      6000   0.000000       5.760000       5.760000       0.000000       0.000000
0.000001        1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33      14      7000   0.000000       11.520000      11.520000      0.000000       0.000000
0.000001        1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33      14      8000   0.000000       4.320000       4.320000       0.000000       0.000000
0.000001        1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33      14      9000   0.000000       5.400000       5.400000       0.000000       0.000000
0.000001        1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
33      14      10000  0.000000       0.000000       0.000000       0.000000       0.000000
0.000001        1.640000       80.000000      0.000000       0.000000       0.000000       0.000000
33      14      11111  0.000000       3.600000       3.600000       0.000000       0.000000
0.000001        1.640000       0.000000       0.000000       50.000000      0.000000       0.000000
33      14      11112  0.000000       3.600000       3.600000       0.000000       0.000000
0.000001        1.640000       0.000000       0.000000       50.000000      0.000000       0.000000
33      14      11121  0.000000       3.600000       3.600000       0.000000       0.000000
0.000001        1.640000       0.000000       0.000000       50.000000      0.000000       0.000000
33      14      11122  0.000000       3.600000       3.600000       0.000000       0.000000
0.000001        1.640000       0.000000       0.000000       50.000000      0.000000       0.000000
33      14      11211  0.000000       3.600000       3.600000       0.000000       0.000000
0.000001        1.640000       0.000000       0.000000       50.000000      0.000000       0.000000
33      14      11212  0.000000       3.600000       3.600000       0.000000       0.000000
0.000001        1.640000       0.000000       0.000000       50.000000      0.000000       0.000000
33      14      11221  0.000000       3.600000       3.600000       0.000000       0.000000
0.000001        1.640000       0.000000       0.000000       50.000000      0.000000       0.000000
33      14      11222  0.000000       3.600000       3.600000       0.000000       0.000000
0.000001        1.640000       0.000000       0.000000       50.000000      0.000000       0.000000
33      14      11311  0.000000       3.600000       3.600000       0.000000       0.000000
0.000001        1.640000       0.000000       0.000000       50.000000      0.000000       0.000000
33      14      11312  0.000000       3.600000       3.600000       0.000000       0.000000
0.000001        1.640000       0.000000       0.000000       50.000000      0.000000       0.000000
33      14      11321  0.000000       3.600000       3.600000       0.000000       0.000000
0.000001        1.640000       0.000000       0.000000       50.000000      0.000000       0.000000
33      14      11322  0.000000       3.600000       3.600000       0.000000       0.000000
0.000001        1.640000       0.000000       0.000000       50.000000      0.000000       0.000000
33      14      11411  0.000000       3.600000       3.600000       0.000000       0.000000
0.000001        1.640000       0.000000       0.000000       50.000000      0.000000       0.000000
33      14      11412  0.000000       3.600000       3.600000       0.000000       0.000000
0.000001        1.640000       0.000000       0.000000       50.000000      0.000000       0.000000
33      14      11421  0.000000       3.600000       3.600000       0.000000       0.000000
0.000001        1.640000       0.000000       0.000000       50.000000      0.000000       0.000000
33      14      11422  0.000000       3.600000       3.600000       0.000000       0.000000
0.000001        1.640000       0.000000       0.000000       50.000000      0.000000       0.000000
33      14      12111  0.000000       3.600000       3.600000       0.000000       0.000000
0.000001        1.640000       0.000000       0.000000       50.000000      0.000000       0.000000
33      14      12112  0.000000       3.600000       3.600000       0.000000       0.000000
0.000001        1.640000       0.000000       0.000000       50.000000      0.000000       0.000000
```

```
33      14      12121   0.000000        3.600000        3.600000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        50.000000       0.000000        0.000000
33      14      12122   0.000000        3.600000        3.600000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        50.000000       0.000000        0.000000
33      14      12211   0.000000        3.600000        3.600000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        50.000000       0.000000        0.000000
33      14      12212   0.000000        3.600000        3.600000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        50.000000       0.000000        0.000000
33      14      12221   0.000000        3.600000        3.600000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        50.000000       0.000000        0.000000
33      14      12222   0.000000        3.600000        3.600000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        50.000000       0.000000        0.000000
33      14      12311   0.000000        3.600000        3.600000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        50.000000       0.000000        0.000000
33      14      12312   0.000000        3.600000        3.600000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        50.000000       0.000000        0.000000
33      14      12321   0.000000        3.600000        3.600000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        50.000000       0.000000        0.000000
33      14      12322   0.000000        3.600000        3.600000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        50.000000       0.000000        0.000000
33      14      12411   0.000000        3.600000        3.600000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        50.000000       0.000000        0.000000
33      14      12412   0.000000        3.600000        3.600000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        50.000000       0.000000        0.000000
33      14      12421   0.000000        3.600000        3.600000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        50.000000       0.000000        0.000000
33      14      12422   0.000000        3.600000        3.600000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        50.000000       0.000000        0.000000
33      14      13111   0.000000        0.720000        0.720000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        50.000000       0.000000        0.000000
33      14      13112   0.000000        0.720000        0.720000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        50.000000       0.000000        0.000000
33      14      13121   0.000000        0.720000        0.720000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        50.000000       0.000000        0.000000
33      14      13122   0.000000        0.720000        0.720000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        50.000000       0.000000        0.000000
33      14      13211   0.000000        0.720000        0.720000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        50.000000       0.000000        0.000000
33      14      13212   0.000000        0.720000        0.720000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        50.000000       0.000000        0.000000
33      14      13221   0.000000        0.720000        0.720000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        50.000000       0.000000        0.000000
33      14      13222   0.000000        0.720000        0.720000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        50.000000       0.000000        0.000000
33      14      13231   0.000000        0.720000        0.720000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        50.000000       0.000000        0.000000
33      14      13232   0.000000        0.720000        0.720000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        50.000000       0.000000        0.000000
33      14      13311   0.000000        0.720000        0.720000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        50.000000       0.000000        0.000000
33      14      13312   0.000000        0.720000        0.720000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        50.000000       0.000000        0.000000
33      14      13321   0.000000        0.720000        0.720000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        50.000000       0.000000        0.000000
33      14      13322   0.000000        0.720000        0.720000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        50.000000       0.000000        0.000000
33      14      13331   0.000000        0.720000        0.720000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        50.000000       0.000000        0.000000
33      14      13411   0.000000        0.720000        0.720000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        50.000000       0.000000        0.000000
33      14      13412   0.000000        0.720000        0.720000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        50.000000       0.000000        0.000000
33      14      13421   0.000000        0.720000        0.720000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        50.000000       0.000000        0.000000
33      14      13422   0.000000        0.720000        0.720000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        50.000000       0.000000        0.000000
33      14      13431   0.000000        0.720000        0.720000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        50.000000       0.000000        0.000000
33      14      13432   0.000000        0.720000        0.720000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        50.000000       0.000000        0.000000
33      14      14121   0.000000        0.720000        0.720000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        50.000000       0.000000        0.000000
33      14      14122   0.000000        0.720000        0.720000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        50.000000       0.000000        0.000000
33      14      14131   0.000000        0.720000        0.720000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        50.000000       0.000000        0.000000
33      14      14132   0.000000        0.720000        0.720000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        50.000000       0.000000        0.000000
```

```
33      14     14221  0.000000       0.720000       0.720000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       50.000000      0.000000       0.000000
33      14     14222  0.000000       0.720000       0.720000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       50.000000      0.000000       0.000000
33      14     14231  0.000000       0.720000       0.720000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       50.000000      0.000000       0.000000
33      14     14232  0.000000       0.720000       0.720000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       50.000000      0.000000       0.000000
33      14     14321  0.000000       0.720000       0.720000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       50.000000      0.000000       0.000000
33      14     14322  0.000000       0.720000       0.720000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       50.000000      0.000000       0.000000
33      14     14331  0.000000       0.720000       0.720000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       50.000000      0.000000       0.000000
33      14     14332  0.000000       0.720000       0.720000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       50.000000      0.000000       0.000000
33      14     14421  0.000000       0.720000       0.720000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       50.000000      0.000000       0.000000
33      14     14422  0.000000       0.720000       0.720000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       50.000000      0.000000       0.000000
33      14     14431  0.000000       0.720000       0.720000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       50.000000      0.000000       0.000000
33      14     14432  0.000000       0.720000       0.720000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       50.000000      0.000000       0.000000
33      14     15121  0.000000       0.720000       0.720000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       50.000000      0.000000       0.000000
33      14     15122  0.000000       0.720000       0.720000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       50.000000      0.000000       0.000000
33      14     15131  0.000000       0.720000       0.720000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       50.000000      0.000000       0.000000
33      14     15132  0.000000       0.720000       0.720000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       50.000000      0.000000       0.000000
33      14     15221  0.000000       0.720000       0.720000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       50.000000      0.000000       0.000000
33      14     15222  0.000000       0.720000       0.720000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       50.000000      0.000000       0.000000
33      14     15231  0.000000       0.720000       0.720000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       50.000000      0.000000       0.000000
33      14     15232  0.000000       0.720000       0.720000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       50.000000      0.000000       0.000000
33      14     15321  0.000000       0.720000       0.720000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       50.000000      0.000000       0.000000
33      14     15322  0.000000       0.720000       0.720000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       50.000000      0.000000       0.000000
33      14     15331  0.000000       0.720000       0.720000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       50.000000      0.000000       0.000000
33      14     15332  0.000000       0.720000       0.720000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       50.000000      0.000000       0.000000
33      14     15421  0.000000       0.720000       0.720000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       50.000000      0.000000       0.000000
33      14     15422  0.000000       0.720000       0.720000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       50.000000      0.000000       0.000000
33      14     15431  0.000000       0.720000       0.720000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       50.000000      0.000000       0.000000
33      14     15432  0.000000       0.720000       0.720000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       50.000000      0.000000       0.000000
33      14     16000  0.000000       0.000000       0.000000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
40      3      1000   0.000000       0.000000       0.000000       0.000000       0.001000
0.500000       0.800000       0.000000       0.000000       0.000000       0.000000       0.000000
40      3      2000   0.000000       0.000000       0.000000       0.000000       0.001000
0.500000       0.800000       0.000000       0.000000       0.000000       0.000000       0.000000
40      3      3000   0.000000       0.000000       0.000000       0.000000       0.001000
0.500000       0.800000       0.000000       0.000000       0.000000       0.000000       0.000000
40      3      4000   0.000000       0.000000       0.000000       0.000000       0.060000
1.400000       0.600000       0.000000       0.000000       0.000000       0.000000       0.000000
40      3      5000   0.000000       0.000000       0.000000       0.000000       0.080000
1.400000       0.600000       0.000000       0.000000       0.000000       0.000000       0.000000
40      3      6000   0.000000       0.000000       0.000000       0.000000       0.200000
0.800000       0.800000       0.000000       0.000000       0.000000       0.000000       0.000000
40      3      7000   0.000000       0.000000       0.000000       0.000000       0.100000
0.800000       0.900000       0.000000       0.000000       0.000000       0.000000       0.000000
40      3      8000   0.000000       0.000000       0.000000       0.000000       0.020000
0.800000       0.600000       0.000000       0.000000       0.000000       0.000000       0.000000
40      3      9000   0.000000       0.000000       0.000000       0.000000       0.020000
0.800000       0.600000       0.000000       0.000000       0.000000       0.000000       0.000000
40      3      10000  0.000000       0.000000       0.000000       0.000000       0.000000
0.000001       1.640000       4.000000       0.000000       0.000000       0.000000       0.000000
```

```
40      3       11111   0.000000        0.000000        0.000000        0.000000        0.010000
0.800000        1.640000        0.000000        1.000000        0.300000        0.000000        0.000000
40      3       11112   0.000000        0.000000        0.000000        0.000000        0.010000
0.800000        1.640000        0.000000        1.000000        0.300000        0.000000        0.000000
40      3       11121   0.000000        0.000000        0.000000        0.000000        0.010000
0.800000        1.640000        0.000000        1.000000        0.300000        0.000000        0.000000
40      3       11122   0.000000        0.000000        0.000000        0.000000        0.010000
0.800000        1.640000        0.000000        1.000000        0.300000        0.000000        0.000000
40      3       11211   0.000000        0.000000        0.000000        0.000000        0.010000
0.800000        1.640000        0.000000        1.000000        0.300000        0.000000        0.000000
40      3       11212   0.000000        0.000000        0.000000        0.000000        0.010000
0.800000        1.640000        0.000000        1.000000        0.300000        0.000000        0.000000
40      3       11221   0.000000        0.000000        0.000000        0.000000        0.010000
0.800000        1.640000        0.000000        1.000000        0.300000        0.000000        0.000000
40      3       11222   0.000000        0.000000        0.000000        0.000000        0.010000
0.800000        1.640000        0.000000        1.000000        0.300000        0.000000        0.000000
40      3       11311   0.000000        0.000000        0.000000        0.000000        0.010000
0.800000        1.640000        0.000000        1.000000        0.300000        0.000000        0.000000
40      3       11312   0.000000        0.000000        0.000000        0.000000        0.010000
0.800000        1.640000        0.000000        1.000000        0.300000        0.000000        0.000000
40      3       11321   0.000000        0.000000        0.000000        0.000000        0.010000
0.800000        1.640000        0.000000        1.000000        0.300000        0.000000        0.000000
40      3       11322   0.000000        0.000000        0.000000        0.000000        0.010000
0.800000        1.640000        0.000000        1.000000        0.300000        0.000000        0.000000
40      3       11411   0.000000        0.000000        0.000000        0.000000        0.010000
0.800000        1.640000        0.000000        1.000000        0.300000        0.000000        0.000000
40      3       11412   0.000000        0.000000        0.000000        0.000000        0.010000
0.800000        1.640000        0.000000        1.000000        0.300000        0.000000        0.000000
40      3       11421   0.000000        0.000000        0.000000        0.000000        0.010000
0.800000        1.640000        0.000000        1.000000        0.300000        0.000000        0.000000
40      3       11422   0.000000        0.000000        0.000000        0.000000        0.010000
0.800000        1.640000        0.000000        1.000000        0.300000        0.000000        0.000000
40      3       12111   0.000000        0.000000        0.000000        0.000000        0.010000
0.800000        1.640000        0.000000        1.000000        0.300000        0.000000        0.000000
40      3       12112   0.000000        0.000000        0.000000        0.000000        0.010000
0.800000        1.640000        0.000000        1.000000        0.300000        0.000000        0.000000
40      3       12121   0.000000        0.000000        0.000000        0.000000        0.010000
0.800000        1.640000        0.000000        1.000000        0.300000        0.000000        0.000000
40      3       12122   0.000000        0.000000        0.000000        0.000000        0.010000
0.800000        1.640000        0.000000        1.000000        0.300000        0.000000        0.000000
40      3       12211   0.000000        0.000000        0.000000        0.000000        0.010000
0.800000        1.640000        0.000000        1.000000        0.300000        0.000000        0.000000
40      3       12212   0.000000        0.000000        0.000000        0.000000        0.010000
0.800000        1.640000        0.000000        1.000000        0.300000        0.000000        0.000000
40      3       12221   0.000000        0.000000        0.000000        0.000000        0.010000
0.800000        1.640000        0.000000        1.000000        0.300000        0.000000        0.000000
40      3       12222   0.000000        0.000000        0.000000        0.000000        0.010000
0.800000        1.640000        0.000000        1.000000        0.300000        0.000000        0.000000
40      3       12311   0.000000        0.000000        0.000000        0.000000        0.010000
0.800000        1.640000        0.000000        1.000000        0.300000        0.000000        0.000000
40      3       12312   0.000000        0.000000        0.000000        0.000000        0.010000
0.800000        1.640000        0.000000        1.000000        0.300000        0.000000        0.000000
40      3       12321   0.000000        0.000000        0.000000        0.000000        0.010000
0.800000        1.640000        0.000000        1.000000        0.300000        0.000000        0.000000
40      3       12322   0.000000        0.000000        0.000000        0.000000        0.010000
0.800000        1.640000        0.000000        1.000000        0.300000        0.000000        0.000000
40      3       12411   0.000000        0.000000        0.000000        0.000000        0.010000
0.800000        1.640000        0.000000        1.000000        0.300000        0.000000        0.000000
40      3       12412   0.000000        0.000000        0.000000        0.000000        0.010000
0.800000        1.640000        0.000000        1.000000        0.300000        0.000000        0.000000
40      3       12421   0.000000        0.000000        0.000000        0.000000        0.010000
0.800000        1.640000        0.000000        1.000000        0.300000        0.000000        0.000000
40      3       12422   0.000000        0.000000        0.000000        0.000000        0.010000
0.800000        1.640000        0.000000        1.000000        0.300000        0.000000        0.000000
40      3       13111   0.000000        0.000000        0.000000        0.000000        1.500000
8.000000        1.640000        0.000000        1.000000        0.300000        0.000000        0.000000
40      3       13112   0.000000        0.000000        0.000000        0.000000        1.500000
8.000000        1.640000        0.000000        1.000000        0.300000        0.000000        0.000000
40      3       13121   0.000000        0.000000        0.000000        0.000000        1.500000
8.000000        1.640000        0.000000        1.000000        0.300000        0.000000        0.000000
40      3       13122   0.000000        0.000000        0.000000        0.000000        1.500000
8.000000        1.640000        0.000000        1.000000        0.300000        0.000000        0.000000
40      3       13211   0.000000        0.000000        0.000000        0.000000        1.500000
8.000000        1.640000        0.000000        1.000000        0.300000        0.000000        0.000000
40      3       13212   0.000000        0.000000        0.000000        0.000000        1.500000
8.000000        1.640000        0.000000        1.000000        0.300000        0.000000        0.000000
40      3       13221   0.000000        0.000000        0.000000        0.000000        1.500000
8.000000        1.640000        0.000000        1.000000        0.300000        0.000000        0.000000
```

```
40      3      13222  0.000000       0.000000       0.000000       0.000000       1.500000
8.000000       1.640000       0.000000       1.000000       0.300000       0.000000       0.000000
40      3      13231  0.000000       0.000000       0.000000       0.000000       1.500000
8.000000       1.640000       0.000000       1.000000       0.300000       0.000000       0.000000
40      3      13232  0.000000       0.000000       0.000000       0.000000       1.500000
8.000000       1.640000       0.000000       1.000000       0.300000       0.000000       0.000000
40      3      13311  0.000000       0.000000       0.000000       0.000000       1.500000
8.000000       1.640000       0.000000       1.000000       0.300000       0.000000       0.000000
40      3      13312  0.000000       0.000000       0.000000       0.000000       1.500000
8.000000       1.640000       0.000000       1.000000       0.300000       0.000000       0.000000
40      3      13321  0.000000       0.000000       0.000000       0.000000       1.500000
8.000000       1.640000       0.000000       1.000000       0.300000       0.000000       0.000000
40      3      13322  0.000000       0.000000       0.000000       0.000000       1.500000
8.000000       1.640000       0.000000       1.000000       0.300000       0.000000       0.000000
40      3      13331  0.000000       0.000000       0.000000       0.000000       1.500000
8.000000       1.640000       0.000000       1.000000       0.300000       0.000000       0.000000
40      3      13411  0.000000       0.000000       0.000000       0.000000       1.500000
8.000000       1.640000       0.000000       1.000000       0.300000       0.000000       0.000000
40      3      13412  0.000000       0.000000       0.000000       0.000000       1.500000
8.000000       1.640000       0.000000       1.000000       0.300000       0.000000       0.000000
40      3      13421  0.000000       0.000000       0.000000       0.000000       1.500000
8.000000       1.640000       0.000000       1.000000       0.300000       0.000000       0.000000
40      3      13422  0.000000       0.000000       0.000000       0.000000       1.500000
8.000000       1.640000       0.000000       1.000000       0.300000       0.000000       0.000000
40      3      13431  0.000000       0.000000       0.000000       0.000000       1.500000
8.000000       1.640000       0.000000       1.000000       0.300000       0.000000       0.000000
40      3      13432  0.000000       0.000000       0.000000       0.000000       1.500000
8.000000       1.640000       0.000000       1.000000       0.300000       0.000000       0.000000
40      3      14121  0.000000       0.000000       0.000000       0.000000       0.050000
0.500000       1.640000       0.000000       1.000000       0.300000       0.000000       0.000000
40      3      14122  0.000000       0.000000       0.000000       0.000000       0.050000
0.500000       1.640000       0.000000       1.000000       0.300000       0.000000       0.000000
40      3      14131  0.000000       0.000000       0.000000       0.000000       0.050000
0.500000       1.640000       0.000000       1.000000       0.300000       0.000000       0.000000
40      3      14132  0.000000       0.000000       0.000000       0.000000       0.050000
0.500000       1.640000       0.000000       1.000000       0.300000       0.000000       0.000000
40      3      14221  0.000000       0.000000       0.000000       0.000000       0.050000
0.500000       1.640000       0.000000       1.000000       0.300000       0.000000       0.000000
40      3      14222  0.000000       0.000000       0.000000       0.000000       0.050000
0.500000       1.640000       0.000000       1.000000       0.300000       0.000000       0.000000
40      3      14231  0.000000       0.000000       0.000000       0.000000       0.050000
0.500000       1.640000       0.000000       1.000000       0.300000       0.000000       0.000000
40      3      14232  0.000000       0.000000       0.000000       0.000000       0.050000
0.500000       1.640000       0.000000       1.000000       0.300000       0.000000       0.000000
40      3      14321  0.000000       0.000000       0.000000       0.000000       0.050000
0.500000       1.640000       0.000000       1.000000       0.300000       0.000000       0.000000
40      3      14322  0.000000       0.000000       0.000000       0.000000       0.050000
0.500000       1.640000       0.000000       1.000000       0.300000       0.000000       0.000000
40      3      14331  0.000000       0.000000       0.000000       0.000000       0.050000
0.500000       1.640000       0.000000       1.000000       0.300000       0.000000       0.000000
40      3      14332  0.000000       0.000000       0.000000       0.000000       0.050000
0.500000       1.640000       0.000000       1.000000       0.300000       0.000000       0.000000
40      3      14421  0.000000       0.000000       0.000000       0.000000       0.050000
0.500000       1.640000       0.000000       1.000000       0.300000       0.000000       0.000000
40      3      14422  0.000000       0.000000       0.000000       0.000000       0.050000
0.500000       1.640000       0.000000       1.000000       0.300000       0.000000       0.000000
40      3      14431  0.000000       0.000000       0.000000       0.000000       0.050000
0.500000       1.640000       0.000000       1.000000       0.300000       0.000000       0.000000
40      3      14432  0.000000       0.000000       0.000000       0.000000       0.050000
0.500000       1.640000       0.000000       1.000000       0.300000       0.000000       0.000000
40      3      15121  0.000000       0.000000       0.000000       0.000000       0.050000
0.500000       1.640000       0.000000       1.000000       0.300000       0.000000       0.000000
40      3      15122  0.000000       0.000000       0.000000       0.000000       0.050000
0.500000       1.640000       0.000000       1.000000       0.300000       0.000000       0.000000
40      3      15131  0.000000       0.000000       0.000000       0.000000       0.050000
0.500000       1.640000       0.000000       1.000000       0.300000       0.000000       0.000000
40      3      15132  0.000000       0.000000       0.000000       0.000000       0.050000
0.500000       1.640000       0.000000       1.000000       0.300000       0.000000       0.000000
40      3      15221  0.000000       0.000000       0.000000       0.000000       0.050000
0.500000       1.640000       0.000000       1.000000       0.300000       0.000000       0.000000
40      3      15222  0.000000       0.000000       0.000000       0.000000       0.050000
0.500000       1.640000       0.000000       1.000000       0.300000       0.000000       0.000000
40      3      15231  0.000000       0.000000       0.000000       0.000000       0.050000
0.500000       1.640000       0.000000       1.000000       0.300000       0.000000       0.000000
40      3      15232  0.000000       0.000000       0.000000       0.000000       0.050000
0.500000       1.640000       0.000000       1.000000       0.300000       0.000000       0.000000
40      3      15321  0.000000       0.000000       0.000000       0.000000       0.050000
0.500000       1.640000       0.000000       1.000000       0.300000       0.000000       0.000000
```

```
40      3       15322   0.000000        0.000000        0.000000        0.000000        0.050000
0.500000        1.640000        0.000000        1.000000        0.300000        0.000000        0.000000
40      3       15331   0.000000        0.000000        0.000000        0.000000        0.050000
0.500000        1.640000        0.000000        1.000000        0.300000        0.000000        0.000000
40      3       15332   0.000000        0.000000        0.000000        0.000000        0.050000
0.500000        1.640000        0.000000        1.000000        0.300000        0.000000        0.000000
40      3       15421   0.000000        0.000000        0.000000        0.000000        0.050000
0.500000        1.640000        0.000000        1.000000        0.300000        0.000000        0.000000
40      3       15422   0.000000        0.000000        0.000000        0.000000        0.050000
0.500000        1.640000        0.000000        1.000000        0.300000        0.000000        0.000000
40      3       15431   0.000000        0.000000        0.000000        0.000000        0.050000
0.500000        1.640000        0.000000        1.000000        0.300000        0.000000        0.000000
40      3       15432   0.000000        0.000000        0.000000        0.000000        0.050000
0.500000        1.640000        0.000000        1.000000        0.300000        0.000000        0.000000
40      3       16000   0.000000        0.000000        0.000000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      7       1000    0.000000        4.462500        4.462500        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      7       2000    0.000000        4.462500        4.462500        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      7       3000    0.000000        4.462500        4.462500        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      7       4000    0.000000        7.350000        7.350000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      7       5000    0.000000        6.825000        6.825000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      7       6000    0.000000        7.875000        7.875000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      7       7000    0.000000        7.350000        7.350000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      7       8000    0.000000        1.050000        1.050000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      7       9000    0.000000        1.050000        1.050000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      7       10000   0.000000        0.000000        0.000000        0.000000        0.000000
0.000001        1.640000        0.400000        0.000000        0.000000        0.000000        0.000000
40      7       11111   0.000000        2.000000        2.000000        0.000000        0.000000
0.000001        1.640000        0.000000        0.400000        0.200000        0.000000        0.000000
40      7       11112   0.000000        2.000000        2.000000        0.000000        0.000000
0.000001        1.640000        0.000000        0.400000        0.200000        0.000000        0.000000
40      7       11121   0.000000        2.000000        2.000000        0.000000        0.000000
0.000001        1.640000        0.000000        0.400000        0.200000        0.000000        0.000000
40      7       11122   0.000000        2.000000        2.000000        0.000000        0.000000
0.000001        1.640000        0.000000        0.400000        0.200000        0.000000        0.000000
40      7       11211   0.000000        2.000000        2.000000        0.000000        0.000000
0.000001        1.640000        0.000000        0.400000        0.200000        0.000000        0.000000
40      7       11212   0.000000        2.000000        2.000000        0.000000        0.000000
0.000001        1.640000        0.000000        0.400000        0.200000        0.000000        0.000000
40      7       11221   0.000000        2.000000        2.000000        0.000000        0.000000
0.000001        1.640000        0.000000        0.400000        0.200000        0.000000        0.000000
40      7       11222   0.000000        2.000000        2.000000        0.000000        0.000000
0.000001        1.640000        0.000000        0.400000        0.200000        0.000000        0.000000
40      7       11311   0.000000        2.000000        2.000000        0.000000        0.000000
0.000001        1.640000        0.000000        0.400000        0.200000        0.000000        0.000000
40      7       11312   0.000000        2.000000        2.000000        0.000000        0.000000
0.000001        1.640000        0.000000        0.400000        0.200000        0.000000        0.000000
40      7       11321   0.000000        2.000000        2.000000        0.000000        0.000000
0.000001        1.640000        0.000000        0.400000        0.200000        0.000000        0.000000
40      7       11322   0.000000        2.000000        2.000000        0.000000        0.000000
0.000001        1.640000        0.000000        0.400000        0.200000        0.000000        0.000000
40      7       11411   0.000000        2.000000        2.000000        0.000000        0.000000
0.000001        1.640000        0.000000        0.400000        0.200000        0.000000        0.000000
40      7       11412   0.000000        2.000000        2.000000        0.000000        0.000000
0.000001        1.640000        0.000000        0.400000        0.200000        0.000000        0.000000
40      7       11421   0.000000        2.000000        2.000000        0.000000        0.000000
0.000001        1.640000        0.000000        0.400000        0.200000        0.000000        0.000000
40      7       11422   0.000000        2.000000        2.000000        0.000000        0.000000
0.000001        1.640000        0.000000        0.400000        0.200000        0.000000        0.000000
40      7       12111   0.000000        2.000000        2.000000        0.000000        0.000000
0.000001        1.640000        0.000000        0.400000        0.200000        0.000000        0.000000
40      7       12112   0.000000        2.000000        2.000000        0.000000        0.000000
0.000001        1.640000        0.000000        0.400000        0.200000        0.000000        0.000000
40      7       12121   0.000000        2.000000        2.000000        0.000000        0.000000
0.000001        1.640000        0.000000        0.400000        0.200000        0.000000        0.000000
40      7       12122   0.000000        2.000000        2.000000        0.000000        0.000000
0.000001        1.640000        0.000000        0.400000        0.200000        0.000000        0.000000
40      7       12211   0.000000        2.000000        2.000000        0.000000        0.000000
0.000001        1.640000        0.000000        0.400000        0.200000        0.000000        0.000000
```

```
40     7       12212  0.000000       2.000000       2.000000       0.000000       0.000000
0.000001       1.640000       0.000000       0.400000       0.200000       0.000000       0.000000
40     7       12221  0.000000       2.000000       2.000000       0.000000       0.000000
0.000001       1.640000       0.000000       0.400000       0.200000       0.000000       0.000000
40     7       12222  0.000000       2.000000       2.000000       0.000000       0.000000
0.000001       1.640000       0.000000       0.400000       0.200000       0.000000       0.000000
40     7       12311  0.000000       2.000000       2.000000       0.000000       0.000000
0.000001       1.640000       0.000000       0.400000       0.200000       0.000000       0.000000
40     7       12312  0.000000       2.000000       2.000000       0.000000       0.000000
0.000001       1.640000       0.000000       0.400000       0.200000       0.000000       0.000000
40     7       12321  0.000000       2.000000       2.000000       0.000000       0.000000
0.000001       1.640000       0.000000       0.400000       0.200000       0.000000       0.000000
40     7       12322  0.000000       2.000000       2.000000       0.000000       0.000000
0.000001       1.640000       0.000000       0.400000       0.200000       0.000000       0.000000
40     7       12411  0.000000       2.000000       2.000000       0.000000       0.000000
0.000001       1.640000       0.000000       0.400000       0.200000       0.000000       0.000000
40     7       12412  0.000000       2.000000       2.000000       0.000000       0.000000
0.000001       1.640000       0.000000       0.400000       0.200000       0.000000       0.000000
40     7       12421  0.000000       2.000000       2.000000       0.000000       0.000000
0.000001       1.640000       0.000000       0.400000       0.200000       0.000000       0.000000
40     7       12422  0.000000       2.000000       2.000000       0.000000       0.000000
0.000001       1.640000       0.000000       0.400000       0.200000       0.000000       0.000000
40     7       13111  0.000000       8.000000       8.000000       0.000000       0.000000
0.000001       1.640000       0.000000       1.200000       0.600000       0.000000       0.000000
40     7       13112  0.000000       8.000000       8.000000       0.000000       0.000000
0.000001       1.640000       0.000000       1.200000       0.600000       0.000000       0.000000
40     7       13121  0.000000       8.000000       8.000000       0.000000       0.000000
0.000001       1.640000       0.000000       1.200000       0.600000       0.000000       0.000000
40     7       13122  0.000000       8.000000       8.000000       0.000000       0.000000
0.000001       1.640000       0.000000       1.200000       0.600000       0.000000       0.000000
40     7       13211  0.000000       8.000000       8.000000       0.000000       0.000000
0.000001       1.640000       0.000000       1.200000       0.600000       0.000000       0.000000
40     7       13212  0.000000       8.000000       8.000000       0.000000       0.000000
0.000001       1.640000       0.000000       1.200000       0.600000       0.000000       0.000000
40     7       13221  0.000000       8.000000       8.000000       0.000000       0.000000
0.000001       1.640000       0.000000       1.200000       0.600000       0.000000       0.000000
40     7       13222  0.000000       8.000000       8.000000       0.000000       0.000000
0.000001       1.640000       0.000000       1.200000       0.600000       0.000000       0.000000
40     7       13231  0.000000       8.000000       8.000000       0.000000       0.000000
0.000001       1.640000       0.000000       1.200000       0.600000       0.000000       0.000000
40     7       13232  0.000000       8.000000       8.000000       0.000000       0.000000
0.000001       1.640000       0.000000       1.200000       0.600000       0.000000       0.000000
40     7       13311  0.000000       8.000000       8.000000       0.000000       0.000000
0.000001       1.640000       0.000000       1.200000       0.600000       0.000000       0.000000
40     7       13312  0.000000       8.000000       8.000000       0.000000       0.000000
0.000001       1.640000       0.000000       1.200000       0.600000       0.000000       0.000000
40     7       13321  0.000000       8.000000       8.000000       0.000000       0.000000
0.000001       1.640000       0.000000       1.200000       0.600000       0.000000       0.000000
40     7       13322  0.000000       8.000000       8.000000       0.000000       0.000000
0.000001       1.640000       0.000000       1.200000       0.600000       0.000000       0.000000
40     7       13331  0.000000       8.000000       8.000000       0.000000       0.000000
0.000001       1.640000       0.000000       1.200000       0.600000       0.000000       0.000000
40     7       13411  0.000000       8.000000       8.000000       0.000000       0.000000
0.000001       1.640000       0.000000       1.200000       0.600000       0.000000       0.000000
40     7       13412  0.000000       8.000000       8.000000       0.000000       0.000000
0.000001       1.640000       0.000000       1.200000       0.600000       0.000000       0.000000
40     7       13421  0.000000       8.000000       8.000000       0.000000       0.000000
0.000001       1.640000       0.000000       1.200000       0.600000       0.000000       0.000000
40     7       13422  0.000000       8.000000       8.000000       0.000000       0.000000
0.000001       1.640000       0.000000       1.200000       0.600000       0.000000       0.000000
40     7       13431  0.000000       8.000000       8.000000       0.000000       0.000000
0.000001       1.640000       0.000000       1.200000       0.600000       0.000000       0.000000
40     7       13432  0.000000       8.000000       8.000000       0.000000       0.000000
0.000001       1.640000       0.000000       1.200000       0.600000       0.000000       0.000000
40     7       14121  0.000000       2.000000       2.000000       0.000000       0.000000
0.000001       1.640000       0.000000       0.200000       0.200000       0.000000       0.000000
40     7       14122  0.000000       2.000000       2.000000       0.000000       0.000000
0.000001       1.640000       0.000000       0.200000       0.200000       0.000000       0.000000
40     7       14131  0.000000       2.000000       2.000000       0.000000       0.000000
0.000001       1.640000       0.000000       0.200000       0.200000       0.000000       0.000000
40     7       14132  0.000000       2.000000       2.000000       0.000000       0.000000
0.000001       1.640000       0.000000       0.200000       0.200000       0.000000       0.000000
40     7       14221  0.000000       2.000000       2.000000       0.000000       0.000000
0.000001       1.640000       0.000000       0.200000       0.200000       0.000000       0.000000
40     7       14222  0.000000       2.000000       2.000000       0.000000       0.000000
0.000001       1.640000       0.000000       0.200000       0.200000       0.000000       0.000000
40     7       14231  0.000000       2.000000       2.000000       0.000000       0.000000
0.000001       1.640000       0.000000       0.200000       0.200000       0.000000       0.000000
```

```
40      7      14232  0.000000       2.000000       2.000000       0.000000       0.000000
0.000001       1.640000       0.000000       0.200000       0.200000       0.000000       0.000000
40      7      14321  0.000000       2.000000       2.000000       0.000000       0.000000
0.000001       1.640000       0.000000       0.200000       0.200000       0.000000       0.000000
40      7      14322  0.000000       2.000000       2.000000       0.000000       0.000000
0.000001       1.640000       0.000000       0.200000       0.200000       0.000000       0.000000
40      7      14331  0.000000       2.000000       2.000000       0.000000       0.000000
0.000001       1.640000       0.000000       0.200000       0.200000       0.000000       0.000000
40      7      14332  0.000000       2.000000       2.000000       0.000000       0.000000
0.000001       1.640000       0.000000       0.200000       0.200000       0.000000       0.000000
40      7      14421  0.000000       2.000000       2.000000       0.000000       0.000000
0.000001       1.640000       0.000000       0.200000       0.200000       0.000000       0.000000
40      7      14422  0.000000       2.000000       2.000000       0.000000       0.000000
0.000001       1.640000       0.000000       0.200000       0.200000       0.000000       0.000000
40      7      14431  0.000000       2.000000       2.000000       0.000000       0.000000
0.000001       1.640000       0.000000       0.200000       0.200000       0.000000       0.000000
40      7      14432  0.000000       2.000000       2.000000       0.000000       0.000000
0.000001       1.640000       0.000000       0.200000       0.200000       0.000000       0.000000
40      7      15121  0.000000       2.000000       2.000000       0.000000       0.000000
0.000001       1.640000       0.000000       0.200000       0.200000       0.000000       0.000000
40      7      15122  0.000000       2.000000       2.000000       0.000000       0.000000
0.000001       1.640000       0.000000       0.200000       0.200000       0.000000       0.000000
40      7      15131  0.000000       2.000000       2.000000       0.000000       0.000000
0.000001       1.640000       0.000000       0.200000       0.200000       0.000000       0.000000
40      7      15132  0.000000       2.000000       2.000000       0.000000       0.000000
0.000001       1.640000       0.000000       0.200000       0.200000       0.000000       0.000000
40      7      15221  0.000000       2.000000       2.000000       0.000000       0.000000
0.000001       1.640000       0.000000       0.200000       0.200000       0.000000       0.000000
40      7      15222  0.000000       2.000000       2.000000       0.000000       0.000000
0.000001       1.640000       0.000000       0.200000       0.200000       0.000000       0.000000
40      7      15231  0.000000       2.000000       2.000000       0.000000       0.000000
0.000001       1.640000       0.000000       0.200000       0.200000       0.000000       0.000000
40      7      15232  0.000000       2.000000       2.000000       0.000000       0.000000
0.000001       1.640000       0.000000       0.200000       0.200000       0.000000       0.000000
40      7      15321  0.000000       2.000000       2.000000       0.000000       0.000000
0.000001       1.640000       0.000000       0.200000       0.200000       0.000000       0.000000
40      7      15322  0.000000       2.000000       2.000000       0.000000       0.000000
0.000001       1.640000       0.000000       0.200000       0.200000       0.000000       0.000000
40      7      15331  0.000000       2.000000       2.000000       0.000000       0.000000
0.000001       1.640000       0.000000       0.200000       0.200000       0.000000       0.000000
40      7      15332  0.000000       2.000000       2.000000       0.000000       0.000000
0.000001       1.640000       0.000000       0.200000       0.200000       0.000000       0.000000
40      7      15421  0.000000       2.000000       2.000000       0.000000       0.000000
0.000001       1.640000       0.000000       0.200000       0.200000       0.000000       0.000000
40      7      15422  0.000000       2.000000       2.000000       0.000000       0.000000
0.000001       1.640000       0.000000       0.200000       0.200000       0.000000       0.000000
40      7      15431  0.000000       2.000000       2.000000       0.000000       0.000000
0.000001       1.640000       0.000000       0.200000       0.200000       0.000000       0.000000
40      7      15432  0.000000       2.000000       2.000000       0.000000       0.000000
0.000001       1.640000       0.000000       0.200000       0.200000       0.000000       0.000000
40      7      16000  0.000000       0.000000       0.000000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
40      10     1000   0.000000       0.017500       0.017500       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
40      10     2000   0.000000       0.015000       0.015000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
40      10     3000   0.000000       0.012000       0.012000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
40      10     4000   0.000000       0.015000       0.015000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
40      10     5000   0.000000       0.007500       0.007500       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
40      10     6000   0.000000       0.020000       0.020000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
40      10     7000   0.000000       0.025000       0.025000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
40      10     8000   0.000000       0.011250       0.011250       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
40      10     9000   0.000000       0.003750       0.003750       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
40      10     10000  0.000000       0.000000       0.000000       0.000000       0.000000
0.000001       1.640000       0.100000       0.000000       0.000000       0.000000       0.000000
40      10     11111  0.000000       0.005000       0.005000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
40      10     11112  0.000000       0.005000       0.005000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
40      10     11121  0.000000       0.005000       0.005000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
```

```
40      10      11122   0.000000        0.005000        0.005000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      10      11211   0.000000        0.005000        0.005000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      10      11212   0.000000        0.005000        0.005000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      10      11221   0.000000        0.005000        0.005000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      10      11222   0.000000        0.005000        0.005000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      10      11311   0.000000        0.005000        0.005000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      10      11312   0.000000        0.005000        0.005000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      10      11321   0.000000        0.005000        0.005000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      10      11322   0.000000        0.005000        0.005000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      10      11411   0.000000        0.005000        0.005000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      10      11412   0.000000        0.005000        0.005000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      10      11421   0.000000        0.005000        0.005000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      10      11422   0.000000        0.005000        0.005000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      10      12111   0.000000        0.005000        0.005000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      10      12112   0.000000        0.005000        0.005000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      10      12121   0.000000        0.005000        0.005000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      10      12122   0.000000        0.005000        0.005000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      10      12211   0.000000        0.005000        0.005000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      10      12212   0.000000        0.005000        0.005000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      10      12221   0.000000        0.005000        0.005000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      10      12222   0.000000        0.005000        0.005000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      10      12311   0.000000        0.005000        0.005000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      10      12312   0.000000        0.005000        0.005000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      10      12321   0.000000        0.005000        0.005000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      10      12322   0.000000        0.005000        0.005000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      10      12411   0.000000        0.005000        0.005000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      10      12412   0.000000        0.005000        0.005000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      10      12421   0.000000        0.005000        0.005000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      10      12422   0.000000        0.005000        0.005000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      10      13111   0.000000        0.001000        0.001000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      10      13112   0.000000        0.001000        0.001000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      10      13121   0.000000        0.001000        0.001000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      10      13122   0.000000        0.001000        0.001000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      10      13211   0.000000        0.001000        0.001000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      10      13212   0.000000        0.001000        0.001000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      10      13221   0.000000        0.001000        0.001000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      10      13222   0.000000        0.001000        0.001000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      10      13231   0.000000        0.001000        0.001000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      10      13232   0.000000        0.001000        0.001000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
```

```
40      10      13311   0.000000        0.001000        0.001000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      10      13312   0.000000        0.001000        0.001000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      10      13321   0.000000        0.001000        0.001000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      10      13322   0.000000        0.001000        0.001000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      10      13331   0.000000        0.001000        0.001000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      10      13411   0.000000        0.001000        0.001000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      10      13412   0.000000        0.001000        0.001000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      10      13421   0.000000        0.001000        0.001000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      10      13422   0.000000        0.001000        0.001000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      10      13431   0.000000        0.001000        0.001000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      10      13432   0.000000        0.001000        0.001000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      10      14121   0.000000        0.001000        0.001000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      10      14122   0.000000        0.001000        0.001000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      10      14131   0.000000        0.001000        0.001000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      10      14132   0.000000        0.001000        0.001000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      10      14221   0.000000        0.001000        0.001000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      10      14222   0.000000        0.001000        0.001000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      10      14231   0.000000        0.001000        0.001000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      10      14232   0.000000        0.001000        0.001000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      10      14321   0.000000        0.001000        0.001000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      10      14322   0.000000        0.001000        0.001000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      10      14331   0.000000        0.001000        0.001000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      10      14332   0.000000        0.001000        0.001000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      10      14421   0.000000        0.001000        0.001000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      10      14422   0.000000        0.001000        0.001000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      10      14431   0.000000        0.001000        0.001000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      10      14432   0.000000        0.001000        0.001000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      10      15121   0.000000        0.001000        0.001000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      10      15122   0.000000        0.001000        0.001000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      10      15131   0.000000        0.001000        0.001000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      10      15132   0.000000        0.001000        0.001000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      10      15221   0.000000        0.001000        0.001000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      10      15222   0.000000        0.001000        0.001000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      10      15231   0.000000        0.001000        0.001000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      10      15232   0.000000        0.001000        0.001000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      10      15321   0.000000        0.001000        0.001000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      10      15322   0.000000        0.001000        0.001000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      10      15331   0.000000        0.001000        0.001000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      10      15332   0.000000        0.001000        0.001000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
```

```
40      10      15421   0.000000        0.001000        0.001000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      10      15422   0.000000        0.001000        0.001000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      10      15431   0.000000        0.001000        0.001000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      10      15432   0.000000        0.001000        0.001000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      10      16000   0.000000        0.000000        0.000000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      11      1000    0.000000        1.750000        1.750000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      11      2000    0.000000        1.500000        1.500000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      11      3000    0.000000        1.200000        1.200000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      11      4000    0.000000        1.500000        1.500000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      11      5000    0.000000        0.750000        0.750000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      11      6000    0.000000        2.000000        2.000000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      11      7000    0.000000        2.500000        2.500000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      11      8000    0.000000        1.125000        1.125000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      11      9000    0.000000        0.375000        0.375000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      11      10000   0.000000        0.000000        0.000000        0.000000        0.000000
0.000001        1.640000        25.000000       0.000000        0.000000        0.000000        0.000000
40      11      11111   0.000000        0.500000        0.500000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      11      11112   0.000000        0.500000        0.500000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      11      11121   0.000000        0.500000        0.500000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      11      11122   0.000000        0.500000        0.500000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      11      11211   0.000000        0.500000        0.500000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      11      11212   0.000000        0.500000        0.500000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      11      11221   0.000000        0.500000        0.500000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      11      11222   0.000000        0.500000        0.500000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      11      11311   0.000000        0.500000        0.500000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      11      11312   0.000000        0.500000        0.500000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      11      11321   0.000000        0.500000        0.500000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      11      11322   0.000000        0.500000        0.500000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      11      11411   0.000000        0.500000        0.500000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      11      11412   0.000000        0.500000        0.500000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      11      11421   0.000000        0.500000        0.500000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      11      11422   0.000000        0.500000        0.500000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      11      12111   0.000000        0.500000        0.030000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      11      12112   0.000000        0.500000        0.030000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      11      12121   0.000000        0.500000        0.030000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      11      12122   0.000000        0.500000        0.030000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      11      12211   0.000000        0.500000        0.030000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      11      12212   0.000000        0.500000        0.030000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      11      12221   0.000000        0.500000        0.030000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      11      12222   0.000000        0.500000        0.030000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
```

```
40      11     12311   0.000000       0.500000       0.030000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
40      11     12312   0.000000       0.500000       0.030000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
40      11     12321   0.000000       0.500000       0.030000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
40      11     12322   0.000000       0.500000       0.030000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
40      11     12411   0.000000       0.500000       0.030000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
40      11     12412   0.000000       0.500000       0.030000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
40      11     12421   0.000000       0.500000       0.030000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
40      11     12422   0.000000       0.500000       0.030000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
40      11     13111   0.000000       0.100000       0.100000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
40      11     13112   0.000000       0.100000       0.100000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
40      11     13121   0.000000       0.100000       0.100000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
40      11     13122   0.000000       0.100000       0.100000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
40      11     13211   0.000000       0.100000       0.100000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
40      11     13212   0.000000       0.100000       0.100000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
40      11     13221   0.000000       0.100000       0.100000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
40      11     13222   0.000000       0.100000       0.100000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
40      11     13231   0.000000       0.100000       0.100000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
40      11     13232   0.000000       0.100000       0.100000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
40      11     13311   0.000000       0.100000       0.100000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
40      11     13312   0.000000       0.100000       0.100000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
40      11     13321   0.000000       0.100000       0.100000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
40      11     13322   0.000000       0.100000       0.100000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
40      11     13331   0.000000       0.100000       0.100000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
40      11     13411   0.000000       0.100000       0.100000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
40      11     13412   0.000000       0.100000       0.100000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
40      11     13421   0.000000       0.100000       0.100000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
40      11     13422   0.000000       0.100000       0.100000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
40      11     13431   0.000000       0.100000       0.100000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
40      11     13432   0.000000       0.100000       0.100000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
40      11     14121   0.000000       0.100000       0.100000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
40      11     14122   0.000000       0.100000       0.100000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
40      11     14131   0.000000       0.100000       0.100000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
40      11     14132   0.000000       0.100000       0.100000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
40      11     14221   0.000000       0.100000       0.100000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
40      11     14222   0.000000       0.100000       0.100000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
40      11     14231   0.000000       0.100000       0.100000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
40      11     14232   0.000000       0.100000       0.100000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
40      11     14321   0.000000       0.100000       0.100000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
40      11     14322   0.000000       0.100000       0.100000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
```

```
40      11     14331  0.000000       0.100000       0.100000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
40      11     14332  0.000000       0.100000       0.100000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
40      11     14421  0.000000       0.100000       0.100000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
40      11     14422  0.000000       0.100000       0.100000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
40      11     14431  0.000000       0.100000       0.100000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
40      11     14432  0.000000       0.100000       0.100000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
40      11     15121  0.000000       0.100000       0.100000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
40      11     15122  0.000000       0.100000       0.100000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
40      11     15131  0.000000       0.100000       0.100000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
40      11     15132  0.000000       0.100000       0.100000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
40      11     15221  0.000000       0.100000       0.100000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
40      11     15222  0.000000       0.100000       0.100000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
40      11     15231  0.000000       0.100000       0.100000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
40      11     15232  0.000000       0.100000       0.100000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
40      11     15321  0.000000       0.100000       0.100000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
40      11     15322  0.000000       0.100000       0.100000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
40      11     15331  0.000000       0.100000       0.100000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
40      11     15332  0.000000       0.100000       0.100000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
40      11     15421  0.000000       0.100000       0.100000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
40      11     15422  0.000000       0.100000       0.100000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
40      11     15431  0.000000       0.100000       0.100000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
40      11     15432  0.000000       0.100000       0.100000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
40      11     16000  0.000000       0.000000       0.000000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
40      12     1000   0.000000       0.432000       0.432000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
40      12     2000   0.000000       0.324000       0.324000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
40      12     3000   0.000000       0.108000       0.108000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
40      12     4000   0.000000       0.432000       0.432000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
40      12     5000   0.000000       0.378000       0.378000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
40      12     6000   0.000000       0.518400       0.518400       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
40      12     7000   0.000000       0.691200       0.691200       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
40      12     8000   0.000000       0.270000       0.270000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
40      12     9000   0.000000       0.090000       0.090000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
40      12     10000  0.000000       0.000000       0.000000       0.000000       0.000000
0.000001       1.640000       4.000000       0.000000       0.000000       0.000000       0.000000
40      12     11111  0.000000       0.010000       0.010000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
40      12     11112  0.000000       0.010000       0.010000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
40      12     11121  0.000000       0.010000       0.010000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
40      12     11122  0.000000       0.010000       0.010000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
40      12     11211  0.000000       0.010000       0.010000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
40      12     11212  0.000000       0.010000       0.010000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
```

```
40     12      11221  0.000000       0.010000       0.010000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
40     12      11222  0.000000       0.010000       0.010000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
40     12      11311  0.000000       0.010000       0.010000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
40     12      11312  0.000000       0.010000       0.010000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
40     12      11321  0.000000       0.010000       0.010000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
40     12      11322  0.000000       0.010000       0.010000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
40     12      11411  0.000000       0.010000       0.010000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
40     12      11412  0.000000       0.010000       0.010000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
40     12      11421  0.000000       0.010000       0.010000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
40     12      11422  0.000000       0.010000       0.010000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
40     12      12111  0.000000       0.010000       0.010000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
40     12      12112  0.000000       0.010000       0.010000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
40     12      12121  0.000000       0.010000       0.010000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
40     12      12122  0.000000       0.010000       0.010000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
40     12      12211  0.000000       0.010000       0.010000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
40     12      12212  0.000000       0.010000       0.010000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
40     12      12221  0.000000       0.010000       0.010000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
40     12      12222  0.000000       0.010000       0.010000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
40     12      12311  0.000000       0.010000       0.010000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
40     12      12312  0.000000       0.010000       0.010000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
40     12      12321  0.000000       0.010000       0.010000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
40     12      12322  0.000000       0.010000       0.010000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
40     12      12411  0.000000       0.010000       0.010000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
40     12      12412  0.000000       0.010000       0.010000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
40     12      12421  0.000000       0.010000       0.010000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
40     12      12422  0.000000       0.010000       0.010000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
40     12      13111  0.000000       0.010000       0.010000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
40     12      13112  0.000000       0.010000       0.010000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
40     12      13121  0.000000       0.010000       0.010000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
40     12      13122  0.000000       0.010000       0.010000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
40     12      13211  0.000000       0.010000       0.010000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
40     12      13212  0.000000       0.010000       0.010000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
40     12      13221  0.000000       0.010000       0.010000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
40     12      13222  0.000000       0.010000       0.010000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
40     12      13231  0.000000       0.010000       0.010000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
40     12      13232  0.000000       0.010000       0.010000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
40     12      13311  0.000000       0.010000       0.010000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
40     12      13312  0.000000       0.010000       0.010000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
40     12      13321  0.000000       0.010000       0.010000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
```

```
40     12     13322  0.000000       0.010000       0.010000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
40     12     13331  0.000000       0.010000       0.010000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
40     12     13411  0.000000       0.010000       0.010000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
40     12     13412  0.000000       0.010000       0.010000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
40     12     13421  0.000000       0.010000       0.010000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
40     12     13422  0.000000       0.010000       0.010000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
40     12     13431  0.000000       0.010000       0.010000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
40     12     13432  0.000000       0.010000       0.010000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
40     12     14121  0.000000       0.010000       0.010000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
40     12     14122  0.000000       0.010000       0.010000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
40     12     14131  0.000000       0.010000       0.010000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
40     12     14132  0.000000       0.010000       0.010000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
40     12     14221  0.000000       0.010000       0.010000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
40     12     14222  0.000000       0.010000       0.010000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
40     12     14231  0.000000       0.010000       0.010000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
40     12     14232  0.000000       0.010000       0.010000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
40     12     14321  0.000000       0.010000       0.010000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
40     12     14322  0.000000       0.010000       0.010000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
40     12     14331  0.000000       0.010000       0.010000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
40     12     14332  0.000000       0.010000       0.010000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
40     12     14421  0.000000       0.010000       0.010000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
40     12     14422  0.000000       0.010000       0.010000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
40     12     14431  0.000000       0.010000       0.010000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
40     12     14432  0.000000       0.010000       0.010000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
40     12     15121  0.000000       0.010000       0.010000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
40     12     15122  0.000000       0.010000       0.010000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
40     12     15131  0.000000       0.010000       0.010000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
40     12     15132  0.000000       0.010000       0.010000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
40     12     15221  0.000000       0.010000       0.010000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
40     12     15222  0.000000       0.010000       0.010000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
40     12     15231  0.000000       0.010000       0.010000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
40     12     15232  0.000000       0.010000       0.010000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
40     12     15321  0.000000       0.010000       0.010000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
40     12     15322  0.000000       0.010000       0.010000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
40     12     15331  0.000000       0.010000       0.010000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
40     12     15332  0.000000       0.010000       0.010000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
40     12     15421  0.000000       0.010000       0.010000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
40     12     15422  0.000000       0.010000       0.010000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
40     12     15431  0.000000       0.010000       0.010000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
```

```
40      12      15432   0.000000        0.010000        0.010000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      12      16000   0.000000        0.000000        0.000000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      14      1000    0.000000        13.824000       13.824000       0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      14      2000    0.000000        6.912000        6.912000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      14      3000    0.000000        5.184000        5.184000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      14      4000    0.000000        4.500000        4.500000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      14      5000    0.000000        2.700000        2.700000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      14      6000    0.000000        5.760000        5.760000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      14      7000    0.000000        11.520000       11.520000       0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      14      8000    0.000000        4.320000        4.320000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      14      9000    0.000000        5.400000        5.400000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        0.000000        0.000000        0.000000
40      14      10000   0.000000        0.000000        0.000000        0.000000        0.000000
0.000001        1.640000        80.000000       0.000000        0.000000        0.000000        0.000000
40      14      11111   0.000000        3.600000        3.600000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        50.000000       0.000000        0.000000
40      14      11112   0.000000        3.600000        3.600000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        50.000000       0.000000        0.000000
40      14      11121   0.000000        3.600000        3.600000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        50.000000       0.000000        0.000000
40      14      11122   0.000000        3.600000        3.600000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        50.000000       0.000000        0.000000
40      14      11211   0.000000        3.600000        3.600000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        50.000000       0.000000        0.000000
40      14      11212   0.000000        3.600000        3.600000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        50.000000       0.000000        0.000000
40      14      11221   0.000000        3.600000        3.600000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        50.000000       0.000000        0.000000
40      14      11222   0.000000        3.600000        3.600000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        50.000000       0.000000        0.000000
40      14      11311   0.000000        3.600000        3.600000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        50.000000       0.000000        0.000000
40      14      11312   0.000000        3.600000        3.600000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        50.000000       0.000000        0.000000
40      14      11321   0.000000        3.600000        3.600000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        50.000000       0.000000        0.000000
40      14      11322   0.000000        3.600000        3.600000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        50.000000       0.000000        0.000000
40      14      11411   0.000000        3.600000        3.600000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        50.000000       0.000000        0.000000
40      14      11412   0.000000        3.600000        3.600000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        50.000000       0.000000        0.000000
40      14      11421   0.000000        3.600000        3.600000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        50.000000       0.000000        0.000000
40      14      11422   0.000000        3.600000        3.600000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        50.000000       0.000000        0.000000
40      14      12111   0.000000        3.600000        3.600000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        50.000000       0.000000        0.000000
40      14      12112   0.000000        3.600000        3.600000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        50.000000       0.000000        0.000000
40      14      12121   0.000000        3.600000        3.600000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        50.000000       0.000000        0.000000
40      14      12122   0.000000        3.600000        3.600000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        50.000000       0.000000        0.000000
40      14      12211   0.000000        3.600000        3.600000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        50.000000       0.000000        0.000000
40      14      12212   0.000000        3.600000        3.600000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        50.000000       0.000000        0.000000
40      14      12221   0.000000        3.600000        3.600000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        50.000000       0.000000        0.000000
40      14      12222   0.000000        3.600000        3.600000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        50.000000       0.000000        0.000000
40      14      12311   0.000000        3.600000        3.600000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        50.000000       0.000000        0.000000
40      14      12312   0.000000        3.600000        3.600000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        50.000000       0.000000        0.000000
40      14      12321   0.000000        3.600000        3.600000        0.000000        0.000000
0.000001        1.640000        0.000000        0.000000        50.000000       0.000000        0.000000
```

```
40      14     12322   0.000000       3.600000       3.600000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       50.000000      0.000000       0.000000
40      14     12411   0.000000       3.600000       3.600000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       50.000000      0.000000       0.000000
40      14     12412   0.000000       3.600000       3.600000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       50.000000      0.000000       0.000000
40      14     12421   0.000000       3.600000       3.600000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       50.000000      0.000000       0.000000
40      14     12422   0.000000       3.600000       3.600000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       50.000000      0.000000       0.000000
40      14     13111   0.000000       0.720000       0.720000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       50.000000      0.000000       0.000000
40      14     13112   0.000000       0.720000       0.720000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       50.000000      0.000000       0.000000
40      14     13121   0.000000       0.720000       0.720000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       50.000000      0.000000       0.000000
40      14     13122   0.000000       0.720000       0.720000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       50.000000      0.000000       0.000000
40      14     13211   0.000000       0.720000       0.720000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       50.000000      0.000000       0.000000
40      14     13212   0.000000       0.720000       0.720000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       50.000000      0.000000       0.000000
40      14     13221   0.000000       0.720000       0.720000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       50.000000      0.000000       0.000000
40      14     13222   0.000000       0.720000       0.720000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       50.000000      0.000000       0.000000
40      14     13231   0.000000       0.720000       0.720000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       50.000000      0.000000       0.000000
40      14     13232   0.000000       0.720000       0.720000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       50.000000      0.000000       0.000000
40      14     13311   0.000000       0.720000       0.720000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       50.000000      0.000000       0.000000
40      14     13312   0.000000       0.720000       0.720000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       50.000000      0.000000       0.000000
40      14     13321   0.000000       0.720000       0.720000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       50.000000      0.000000       0.000000
40      14     13322   0.000000       0.720000       0.720000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       50.000000      0.000000       0.000000
40      14     13331   0.000000       0.720000       0.720000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       50.000000      0.000000       0.000000
40      14     13411   0.000000       0.720000       0.720000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       50.000000      0.000000       0.000000
40      14     13412   0.000000       0.720000       0.720000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       50.000000      0.000000       0.000000
40      14     13421   0.000000       0.720000       0.720000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       50.000000      0.000000       0.000000
40      14     13422   0.000000       0.720000       0.720000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       50.000000      0.000000       0.000000
40      14     13431   0.000000       0.720000       0.720000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       50.000000      0.000000       0.000000
40      14     13432   0.000000       0.720000       0.720000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       50.000000      0.000000       0.000000
40      14     14121   0.000000       0.720000       0.720000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       50.000000      0.000000       0.000000
40      14     14122   0.000000       0.720000       0.720000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       50.000000      0.000000       0.000000
40      14     14131   0.000000       0.720000       0.720000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       50.000000      0.000000       0.000000
40      14     14132   0.000000       0.720000       0.720000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       50.000000      0.000000       0.000000
40      14     14221   0.000000       0.720000       0.720000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       50.000000      0.000000       0.000000
40      14     14222   0.000000       0.720000       0.720000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       50.000000      0.000000       0.000000
40      14     14231   0.000000       0.720000       0.720000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       50.000000      0.000000       0.000000
40      14     14232   0.000000       0.720000       0.720000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       50.000000      0.000000       0.000000
40      14     14321   0.000000       0.720000       0.720000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       50.000000      0.000000       0.000000
40      14     14322   0.000000       0.720000       0.720000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       50.000000      0.000000       0.000000
40      14     14331   0.000000       0.720000       0.720000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       50.000000      0.000000       0.000000
40      14     14332   0.000000       0.720000       0.720000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       50.000000      0.000000       0.000000
40      14     14421   0.000000       0.720000       0.720000       0.000000       0.000000
0.000001       1.640000       0.000000       0.000000       50.000000      0.000000       0.000000
```

```
       40      14      14422   0.000000       0.720000       0.720000       0.000000       0.000000
       0.000001       1.640000       0.000000       0.000000       50.000000      0.000000       0.000000
       40      14      14431   0.000000       0.720000       0.720000       0.000000       0.000000
       0.000001       1.640000       0.000000       0.000000       50.000000      0.000000       0.000000
       40      14      14432   0.000000       0.720000       0.720000       0.000000       0.000000
       0.000001       1.640000       0.000000       0.000000       50.000000      0.000000       0.000000
       40      14      15121   0.000000       0.720000       0.720000       0.000000       0.000000
       0.000001       1.640000       0.000000       0.000000       50.000000      0.000000       0.000000
       40      14      15122   0.000000       0.720000       0.720000       0.000000       0.000000
       0.000001       1.640000       0.000000       0.000000       50.000000      0.000000       0.000000
       40      14      15131   0.000000       0.720000       0.720000       0.000000       0.000000
       0.000001       1.640000       0.000000       0.000000       50.000000      0.000000       0.000000
       40      14      15132   0.000000       0.720000       0.720000       0.000000       0.000000
       0.000001       1.640000       0.000000       0.000000       50.000000      0.000000       0.000000
       40      14      15221   0.000000       0.720000       0.720000       0.000000       0.000000
       0.000001       1.640000       0.000000       0.000000       50.000000      0.000000       0.000000
       40      14      15222   0.000000       0.720000       0.720000       0.000000       0.000000
       0.000001       1.640000       0.000000       0.000000       50.000000      0.000000       0.000000
       40      14      15231   0.000000       0.720000       0.720000       0.000000       0.000000
       0.000001       1.640000       0.000000       0.000000       50.000000      0.000000       0.000000
       40      14      15232   0.000000       0.720000       0.720000       0.000000       0.000000
       0.000001       1.640000       0.000000       0.000000       50.000000      0.000000       0.000000
       40      14      15321   0.000000       0.720000       0.720000       0.000000       0.000000
       0.000001       1.640000       0.000000       0.000000       50.000000      0.000000       0.000000
       40      14      15322   0.000000       0.720000       0.720000       0.000000       0.000000
       0.000001       1.640000       0.000000       0.000000       50.000000      0.000000       0.000000
       40      14      15331   0.000000       0.720000       0.720000       0.000000       0.000000
       0.000001       1.640000       0.000000       0.000000       50.000000      0.000000       0.000000
       40      14      15332   0.000000       0.720000       0.720000       0.000000       0.000000
       0.000001       1.640000       0.000000       0.000000       50.000000      0.000000       0.000000
       40      14      15421   0.000000       0.720000       0.720000       0.000000       0.000000
       0.000001       1.640000       0.000000       0.000000       50.000000      0.000000       0.000000
       40      14      15422   0.000000       0.720000       0.720000       0.000000       0.000000
       0.000001       1.640000       0.000000       0.000000       50.000000      0.000000       0.000000
       40      14      15431   0.000000       0.720000       0.720000       0.000000       0.000000
       0.000001       1.640000       0.000000       0.000000       50.000000      0.000000       0.000000
       40      14      15432   0.000000       0.720000       0.720000       0.000000       0.000000
       0.000001       1.640000       0.000000       0.000000       50.000000      0.000000       0.000000
       40      14      16000   0.000000       0.000000       0.000000       0.000000       0.000000
       0.000001       1.640000       0.000000       0.000000       0.000000       0.000000       0.000000
c-------------------------------------------------------------------------------------------
c270 mon-accumulation rate (monaccum)
c    only required if vqofg =1 (see card 255)
c
c    defid   parameter group id
c    dwqid   general quality id
c    deluid  landuse id
c    jan-dec accumulation rate at start of each month (lb/acre/day)
c if in card 250, the unit is #/100ml, the above unit should be #/acre/day
c
c defid dwqid   deluid   jan   feb   mar   apr   may   jun   jul   aug   sep   oct   nov   dec
c-------------------------------------------------------------------------------------
c271 mon-storage limit of quality constituent (monsqolim)
c    only required if vqofg = 1 (see card 255)
c
c    defid   parameter group id
c    dwqid   general quality id
c    deluid  landuse id
c    jan-dec maximum storage at start of each month (lb/acre)
c if in card 250, the unit is #/100ml, the above unit should be #/acre
c
c defid dwqid   deluid   jan   feb   mar   apr   may   jun   jul   aug   sep   oct   nov   dec
c-------------------------------------------------------------------------------------
c272 mon-surfaceflow concentration (monsuroconc)
c    only required if vsqcfg = 1 (see card 255)
c
c    defid   parameter group id
c    dwqid   general quality id
c    deluid  landuse id
c    jan-dec concentration of constituent in surface flow at start of each month (mg/l), (ug/l), or (#/100ml)
c if in card 250, the unit is #/100ml, the above unit should be #/100ml
c
c defid dwqid   deluid   jan   feb   mar   apr   may   jun   jul   aug   sep   oct   nov   dec
c-------------------------------------------------------------------------------------
c273 mon-interflow concentration (moninterconc)
c    only required if viqcfg = 1 (see card 255)
c
c    defid   parameter group id
c    dwqid   general quality id
```

```
c    deluid  landuse id
c    jan-dec concentration of constituent in interflow at start of each month (mg/l), (ug/l), or (#/100ml)
c if in card 250, the unit is #/100ml, the above unit should be #/100ml
c
c defid dwqid   deluid   jan   feb   mar   apr   may   jun   jul   aug   sep   oct   nov   dec
c-----------------------------------------------------------------------------------------
c274 mon-groundwater concentration (mongrndconc)
c    only required if vaqcfg = 1 (see card 255)
c
c    defid   parameter group id
c    dwqid   general quality id
c    deluid  landuse id
c    jan-dec concentration of constituent in groundwater at start of each month (mg/l), (ug/l), or (#/100ml)
c if in card 250, the unit is #/100ml, the above unit should be #/100ml
c
c defid dwqid   deluid   jan   feb   mar   apr   may   jun   jul   aug   sep   oct   nov   dec
c----------------------------------------------------------------------------------------------
c275 mon-atmospheric dry deposition flux
c    only required if maddfglnd = 1 (see card 255)
c
c    defid   parameter group id
c    dwqid   general quality id
c    deluid  landuse id
c    jan-dec flux of constituent in dry deposition at start of each month (lb/acre/day or #/acre/day)
c
c defid dwqid   deluid   jan   feb   mar   apr   may   jun   jul   aug   sep   oct   nov   dec
c----------------------------------------------------------------------------------------------
c276 mon-atmospheric wet deposition concentration
c    only required if mawdfglnd = 1 (see card 255)
c
c    defid   parameter group id
c    dwqid   general quality id
c    deluid  landuse id
c    jan-dec concentration of constituent in atmospheric wet deposition at start of each month (mg/l), (ug/l),
or (#/100ml)
c
c defid dwqid   deluid   jan   feb   mar   apr   may   jun   jul   aug   sep   oct   nov   dec
c----------------------------------------------------------------------------------------------
C280 stream water quality control
c
c    adfgrch     if = 1 atmosperic deposition on reach (0 for no atmospheric deposition)
c    maddfgrch   if = 1 atmosperic dry deposition varies monthly on reach (card 282)
c    mawdfgrch   if = 1 atmosperic wet deposition varies monthly on reach (card 283)
c
c adfgrch  maddfgrch  mawdfgrch
       0       0       0
c-------------------------------------------------------------------------------------------------------------
c281 general quality constituent control
c
c    rgid     stream parameter group id
c    dwqid    general quality id
c    qsdfg    if = 0 no sediment associated qual
c       if = 1 sediment associated in stream, adsorption/desorption of qual is simulated
c    iniCond  initial instream concentration at start of simulation by group (mg/l), (ug/l), or (#/100ml)
c    decay    general first-order instream loss rate of qual by reach group (1/day)
c    tcdecay  temperature correction coefficient for first-order decay of qual (min=1, max=2)
c    addc     atmospheric dry deposition flux (lb/acre/day or #/acre/day)
c    awdc     atmospheric wet deposition concentration (mg/l), (ug/l), or (#/100ml)
c    potber   scour potency pactor for stream bank erosion (lb or #)/ton-sediment
c
c rgid  dwqid   qsdfg   iniCond  decay  tcdecay   addc   awdc   potber
       33      3       0       0.000000       0.300000       1.000000       0.000000       0.000000
       0.000000
       33      7       0       0.000000       0.100000       1.000000       0.000000       0.000000
       0.000000
       33      10      0       0.000000       0.100000       1.000000       0.000000       0.000000
       0.000000
       33      11      0       0.000000       0.100000       1.000000       0.000000       0.000000
       0.000000
       33      12      0       0.000000       0.100000       1.000000       0.000000       0.000000
       0.000000
       33      14      0       0.000000       0.100000       1.000000       0.000000       0.000000
       0.000000
       40      3       0       0.000000       0.100000       1.000000       0.000000       0.000000
       0.000000
       40      7       0       0.000000       0.100000       1.000000       0.000000       0.000000
       0.000000
       40      10      0       0.000000       0.100000       1.000000       0.000000       0.000000
       0.000000
```

```
       40      11      0       0.000000       0.100000       1.000000       0.000000       0.000000
       0.000000
       40      12      0       0.000000       0.100000       1.000000       0.000000       0.000000
       0.000000
       40      14      0       0.000000       0.100000       1.000000       0.000000       0.000000
       0.000000
c-------------------------------------------------------------------------------------------------------
c282 mon-atmospheric dry deposition flux
c    only required if maddfgrch = 1 (see card 280)
c
c    rgid    reach group id
c    dwqid   general quality id
c    jan-dec flux of constituent in dry deposition at start of each month (lb/acre/day or #/acre/day)
c
c rgid dwqid   jan   feb   mar   apr   may   jun   jul   aug   sep   oct   nov   dec
c-------------------------------------------------------------------------------------------
c283 mon-atmospheric wet deposition concentration
c    only required if mawdfgrch = 1 (see card 280)
c
c    rgid    reach group id
c    dwqid   general quality id
c    jan-dec concentration of constituent in atmospheric wet deposition at start of each month (mg/l), (ug/l),
or (#/100ml)
c
c rgid dwqid   jan   feb   mar   apr   may   jun   jul   aug   sep   oct   nov   dec
c-------------------------------------------------------------------------------------------
c285 parameters for decay of contaminant adsorbed to sediment
c    only required if qsdfg > 0 (see card 281)
c
c    rgid      reach group id
c    dwqid     general quality id
c    addcpm1   decay rate for qual adsorbed to suspended sediment (/day)
c    addcpm2   temperature correction coefficient for decay of qual on suspended sediment (range from 1.0 to
2.0)
c    addcpm3   decay rate for qual adsorbed to bed sediment (/day)
c    addcpm4   temperature correction coefficient for decay of qual on bed sediment (range from 1.0 to 2.0)
c
c   rgid  dwqid   addcpm1   addcpm2   addcpm3   addcpm4
       33      3       0.000000       1.000000       0.000000       1.000000
       33      7       0.000000       1.000000       0.000000       1.000000
       33      10      0.000000       1.000000       0.000000       1.000000
       33      11      0.000000       1.000000       0.000000       1.000000
       33      12      0.000000       1.000000       0.000000       1.000000
       33      14      0.000000       1.000000       0.000000       1.000000
       40      3       0.000000       1.000000       0.000000       1.000000
       40      7       0.000000       1.000000       0.000000       1.000000
       40      10      0.000000       1.000000       0.000000       1.000000
       40      11      0.000000       1.000000       0.000000       1.000000
       40      12      0.000000       1.000000       0.000000       1.000000
       40      14      0.000000       1.000000       0.000000       1.000000
c-------------------------------------------------------------------------------------------
c286 adsorption coefficients of qual
c    only required if qsdfg > 0 (see card 281)
c
c    rgid      reach group id
c    dwqid     general quality id
c    adpm1     distribution coefficients for qual with suspended sand (l/mg)
c    adpm2     distribution coefficients for qual with suspended silt (l/mg)
c    adpm3     distribution coefficients for qual with suspended clay (l/mg)
c    adpm4     distribution coefficients for qual with bed sand (l/mg)
c    adpm5     distribution coefficients for qual with bed silt (l/mg)
c    adpm6     distribution coefficients for qual with bed clay (l/mg)
c
c   rgid  dwqid   adpm1   adpm2   adpm3   adpm4   adpm5   adpm6
       33      3       1.000e-10      1.000e-10      1.000e-10      1.000e-10      1.000e-10      1.000e-10
       33      7       1.000e-10      1.000e-10      1.000e-10      1.000e-10      1.000e-10      1.000e-10
       33      10      1.000e-10      1.000e-10      1.000e-10      1.000e-10      1.000e-10      1.000e-10
       33      11      1.000e-10      1.000e-10      1.000e-10      1.000e-10      1.000e-10      1.000e-10
       33      12      1.000e-10      1.000e-10      1.000e-10      1.000e-10      1.000e-10      1.000e-10
       33      14      1.000e-10      1.000e-10      1.000e-10      1.000e-10      1.000e-10      1.000e-10
       40      3       1.000e-10      1.000e-10      1.000e-10      1.000e-10      1.000e-10      1.000e-10
       40      7       1.000e-10      1.000e-10      1.000e-10      1.000e-10      1.000e-10      1.000e-10
       40      10      1.000e-10      1.000e-10      1.000e-10      1.000e-10      1.000e-10      1.000e-10
       40      11      1.000e-10      1.000e-10      1.000e-10      1.000e-10      1.000e-10      1.000e-10
       40      12      1.000e-10      1.000e-10      1.000e-10      1.000e-10      1.000e-10      1.000e-10
       40      14      1.000e-10      1.000e-10      1.000e-10      1.000e-10      1.000e-10      1.000e-10
c-------------------------------------------------------------------------------------------
c287 adsorption/desorption rate parameters
c    only required if qsdfg > 0 (see card 281)
```

```
c
c    rgid      reach group id
c    dwqid     general quality id
c    adpm1     transfer rates between adsorbed and desorbed states of qual with suspended sand (/day)
c    adpm2     transfer rates between adsorbed and desorbed states of qual with suspended silt (/day)
c    adpm3     transfer rates between adsorbed and desorbed states of qual with suspended clay (/day)
c    adpm4     transfer rates between adsorbed and desorbed states of qual with bed sand (/day)
c    adpm5     transfer rates between adsorbed and desorbed states of qual with bed silt (/day)
c    adpm6     transfer rates between adsorbed and desorbed states of qual with bed clay (/day)
c
c   rgid  dwqid   adpm1   adpm2   adpm3   adpm4   adpm5   adpm6
       33     3      0.000010       0.000010       0.000010       0.000010       0.000010       0.000010
       33     7      0.000010       0.000010       0.000010       0.000010       0.000010       0.000010
       33     10     0.000010       0.000010       0.000010       0.000010       0.000010       0.000010
       33     11     0.000010       0.000010       0.000010       0.000010       0.000010       0.000010
       33     12     0.000010       0.000010       0.000010       0.000010       0.000010       0.000010
       33     14     0.000010       0.000010       0.000010       0.000010       0.000010       0.000010
       40     3      0.000010       0.000010       0.000010       0.000010       0.000010       0.000010
       40     7      0.000010       0.000010       0.000010       0.000010       0.000010       0.000010
       40     10     0.000010       0.000010       0.000010       0.000010       0.000010       0.000010
       40     11     0.000010       0.000010       0.000010       0.000010       0.000010       0.000010
       40     12     0.000010       0.000010       0.000010       0.000010       0.000010       0.000010
       40     14     0.000010       0.000010       0.000010       0.000010       0.000010       0.000010
c-------------------------------------------------------------------------------------------
c288 adsorption/desorption temperature correction parameters
c    only required if qsdfg > 0 (see card 281)
c
c    rgid      reach group id
c    dwqid     general quality id
c    adpm1     temperature correction coefficients for adsorption/desorption on suspended sand (range from 1.0
to 2.0)
c    adpm2     temperature correction coefficients for adsorption/desorption on suspended silt (range from 1.0
to 2.0)
c    adpm3     temperature correction coefficients for adsorption/desorption on suspended clay (range from 1.0
to 2.0)
c    adpm4     temperature correction coefficients for adsorption/desorption on bed sand (range from 1.0 to 2.0)
c    adpm5     temperature correction coefficients for adsorption/desorption on bed silt (range from 1.0 to 2.0)
c    adpm6     temperature correction coefficients for adsorption/desorption on bed clay (range from 1.0 to 2.0)
c
c   rgid  dwqid   adpm1   adpm2   adpm3   adpm4   adpm5   adpm6
       33     3      1.000000       1.000000       1.000000       1.000000       1.000000       1.000000
       33     7      1.000000       1.000000       1.000000       1.000000       1.000000       1.000000
       33     10     1.000000       1.000000       1.000000       1.000000       1.000000       1.000000
       33     11     1.000000       1.000000       1.000000       1.000000       1.000000       1.000000
       33     12     1.000000       1.000000       1.000000       1.000000       1.000000       1.000000
       33     14     1.000000       1.000000       1.000000       1.000000       1.000000       1.000000
       40     3      1.000000       1.000000       1.000000       1.000000       1.000000       1.000000
       40     7      1.000000       1.000000       1.000000       1.000000       1.000000       1.000000
       40     10     1.000000       1.000000       1.000000       1.000000       1.000000       1.000000
       40     11     1.000000       1.000000       1.000000       1.000000       1.000000       1.000000
       40     12     1.000000       1.000000       1.000000       1.000000       1.000000       1.000000
       40     14     1.000000       1.000000       1.000000       1.000000       1.000000       1.000000
c-------------------------------------------------------------------------------------------
c289 initial concentrations on sediment
c    only required if qsdfg > 0 (see card 281)
c
c    rgid      reach group id
c    dwqid     general quality id
c    sqal1     initial concentrations of qual on suspended sand (concu/mg)
c    sqal2     initial concentrations of qual on suspended silt (concu/mg)
c    sqal3     initial concentrations of qual on suspended clay (concu/mg)
c    sqal4     initial concentrations of qual on bed sand (concu/mg)
c    sqal5     initial concentrations of qual on bed silt (concu/mg)
c    sqal6     initial concentrations of qual on bed clay (concu/mg)
c
c   rgid  dwqid   sqal1   sqal2   sqal3   sqal4   sqal5   sqal6
       33     3      0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
       33     7      0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
       33     10     0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
       33     11     0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
       33     12     0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
       33     14     0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
       40     3      0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
       40     7      0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
       40     10     0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
       40     11     0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
       40     12     0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
       40     14     0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
c-------------------------------------------------------------------------------------------
```

```
c400 general channel information
c
c    admod   advection method (1 for dynamic mixing same as in HSPF and 2 for static mixing)
c    kc      crop factor associated with PEVT (used to back-calculate EVAP; EVAP = PEVT/kc)
c    sedber  stream bank erosion sediment (1 for on and 0 for off) (if sedfg=1)
c    vconfg  a value of 1 for vconfg means that F(vol) (volume-dependent) outflow demand components are
multiplied by a factor which is allowed to vary through the year.
c            These monthly adjustment factors are input in Table-type MON-CONVF in this section (card 401)
c
c admod    kc   sedber   vconfg
        1      8.500000000000e-01    0      0
c--------------------------------------------------------------------------------------------
c401 monthly F(vol) adjustment factors
c    only required if vconfg = 1 (see card 400)
c
c    rgid     stream parameter group id
c    jan-dec  F(vol) adjustment factors at the start of each month
c
c  rgid jan   feb   mar   apr   may   jun   jul   aug   sep   oct   nov   dec
c--------------------------------------------------------------------------------------------
c405 channel routing network
c
c    rchid   reach id (same as subbasin id)
c    control output control switch for the corresponding reach
c            0 = will not write general output
c            1 = will write general output
c    NumOutlets number of downstream outlets
c    DSn     downstream outlets  DS1   Ds2  ....  DSn
c
c    rchid   control   NumOutlets   DS1   DS2  .......   DSn
        6665   1      1      0
        6671   1      1      0
        6673   1      1      0
        6674   1      1      0
        6675   1      1      0
        6684   1      1      0
        6839   1      1      0
        6844   1      1      0
        6850   1      1      0
        6856   1      1      0
        6859   1      1      0
        6861   1      1      0
c--------------------------------------------------------------------------------------------
c407  reach weather multiplier
c
c    rchid      reach id (same as subbasin id)
c    premult    multiplier for precipitation
c    petmult    multiplier for potential evapotranspiration
c
c rchid  premult  petmult
        6665   1.000000       1.000000
        6671   1.000000       1.000000
        6673   1.000000       1.000000
        6674   1.000000       1.000000
        6675   1.000000       1.000000
        6684   1.000000       1.000000
        6839   1.000000       1.000000
        6844   1.000000       1.000000
        6850   1.000000       1.000000
        6856   1.000000       1.000000
        6859   1.000000       1.000000
        6861   1.000000       1.000000
c-----------------------------------------------------------------------------------------
c410 reach geometry information
c
c    rchid   reach/lake id (same as subbasin id)
c    rgid    reach/lake group id
c    trgid   threshold reach/lake group id
c    lkfg    reach/lake flag (0 for reach otherwise lake)
c            lake flag = 1 (rectangular weir for internal option)
c            lake flag = 2 (triangular weir for internal option)
c            lake flag = 11 (BMP with rectangular weir for internal option)
c            lake flag = 12 (BMP with triangular weir for internal option)
c    idepth  reach/lake initial water depth (feet)
c    length  reach/lake length (miles)
c    depth   reach/lake bank full depth (feet)
c    width   reach/lake bankfull width (feet)
c    slope   reach longitudinal slope
c    mann    reach Manning's roughness coefficient/lake weir width (ft)
```

```
c    r1      reach ratio of bottom width to bank full width (bottom width = r1 * width)/lake orifice height (ft)
c    r2      reach side slope of flood plane/lake orifice diameter (ft)
c    w1      reach flood plane width factor (total width of flood plane = w1*Width)/lake median particle size
diameter, db50 (ft)
c    crat    ratio of maximum velocity to mean velocity in the RCHRES cross-section under typical flow
conditions (greater than or equal to 1)
c    ks      weighting factor for hydraulic routing (calibration)
c    qloss   constant flow loss rate (e.g., infiltration, pumping [in / hr])
c    qloss_t flow loss target reach ID
c    qloss_f flow loss water quality flag for target reach ID (0 - use the target reach instream concentration;
1 - use the source reach instream concentration)
c
c rchid rgid  trgid   lkfg idepth length    depth  width    slope     mann    r1    r2    w1    crrat  ks
qloss   qloss_t   qloss_f
       6665   33     0      0      3.710585       3.279134       3.710585       60.826032      0.003924
       0.020000       0.500000       0.500000       1.500000       1.500000       0.000000       0.000000
       0      0
       6671   33     0      0      0.000000       0.000000       0.000000       0.000000       0.001000
       0.020000       0.500000       0.500000       1.500000       1.500000       0.000000       0.000000
       0      0
       6673   33     0      0      1.351690       2.270340       1.351690       14.684861      0.005145
       0.020000       0.500000       0.500000       1.500000       1.500000       0.000000       0.000000
       0      0
       6674   33     0      0      0.000000       0.000000       0.000000       0.000000       0.001000
       0.020000       0.500000       0.500000       1.500000       1.500000       0.000000       0.000000
       0      0
       6675   33     0      0      1.289354       4.503094       1.289354       13.694059      0.009414
       0.020000       0.500000       0.500000       1.500000       1.500000       0.000000       0.000000
       0      0
       6684   40     0      0      0.744742       2.987388       0.744742       6.338506       0.008740
       0.020000       0.500000       0.500000       1.500000       1.500000       0.000000       0.000000
       0      0
       6839   33     0      0      0.000000       0.000000       0.000000       0.000000       0.001000
       0.020000       0.500000       0.500000       1.500000       1.500000       0.000000       0.000000
       0      0
       6844   40     0      0      0.000000       0.000000       0.000000       0.000000       0.001000
       0.020000       0.500000       0.500000       1.500000       1.500000       0.000000       0.000000
       0      0
       6850   33     0      0      0.000000       0.000000       0.000000       0.000000       0.001000
       0.020000       0.500000       0.500000       1.500000       1.500000       0.000000       0.000000
       0      0
       6856   40     0      0      0.748022       2.776538       0.748022       6.377875       0.006990
       0.020000       0.500000       0.500000       1.500000       1.500000       0.000000       0.000000
       0      0
       6859   33     0      0      0.000000       0.000000       0.000000       0.000000       0.001000
       0.020000       0.500000       0.500000       1.500000       1.500000       0.000000       0.000000
       0      0
       6861   40     0      0      0.000000       0.000000       0.000000       0.000000       0.001000
       0.020000       0.500000       0.500000       1.500000       1.500000       0.000000       0.000000
       0      0
c----------------------------------------------------------------------------------------
c413 Reach Cross-section Information
c
c    rchid   x1 y1 x2 y2...
c    rchid   reach id (same as subbasin id)
c    x       distance from the left reach bank (ft)
c            it should not be greater than bank full width in card 410 (ft)
c    y       depth from the bank full reach segment (ft)
c            it should not be greater than bank full depth in card 410 (ft)
c
c----------------------------------------------------------------------------------------
c415 reach discharge-volume relationship
c
c    rchid   reach id
c    depth   water depth (feet)
c    area    water surface area (acres)
c    vol     water volume (ac-ft)
c    disch(1, 2, 3, ....noutflows)  outflows (cfs)
c
c rchid  depth   area    vol    disch1    disch2   .......   dischN
c----------------------------------------------------------------------------------------
c420 general point source information
c
c    nPtSource   number of individual point sources
c    nPtQuals    number of point source quals
c
c  nPtSource  nPtQuals
       0      0
c----------------------------------------------------------------------------------------
```

```
c425 point source
c    Qualindex  point source qual index
c    Qualname   point source qual name
c    Qualid    point source qual id
c    sqalfr    point source sediment associated qual fraction (0-1)
c
c  Qualindex  Qualname  qualid
c--------------------------------------------------------------------------------------------
c430 point source withdrawal
c    subbasin  point source reach id
c    permit    point source permit
c    pipe      point source pipe
c    wd_target point source withdrawal target reach id
c
c  subbasin  permit  pipe   wd_target
c--------------------------------------------------------------------------------------------
c435 linkage controls (optional)
c
c    rchid         reach id (same as subbasin id)
c    outlet        outlet control switch for the corresponding reach
c                  0 = will read input timeseries file
c                      (rchid/outlet can be duplicated for multiple input files)
c                  n = will write output timeseries file for outlet n.
c    filepath      the timeseries file path (continuous string without space)
c
c rchid    outlet    filepath
c--------------------------------------------------------------------------------------------
c440 sediment parameters controls
c
c    crvfg   if crvfg = 1, erosion-related cover may vary throughout the year.
c            values are supplied in Table-type MON-COVER (card 453)
c    vsivfg  if vsivfg = 1, the rate of net vertical sediment input may vary throughout the year.
c            if vsivfg = 2, the vertical sediment input is added to the detached sediment storage only on days
when no rainfall occurred during the previous day.
c            values are supplied in Table-type MON-NVSI (card 454)
c    sandfg  if sandfg = 0, the sand is not simulated.
c            if sandfg = 1, the sand transport capacity is calculated using the Toffaleti method.
c            if sandfg = 2, the sand transport capacity is calculated using the Colby method.
c            if sandfg = 3, the sand transport capacity is calculated using the power function of velocity.
c    sweepfg if sweepfg = 0, the street sweeping is not simulated.
c            if sweepfg = 1, the street sweeping is applied to sediemnt only.
c            if sweepfg = 2, the street sweeping is applied to sediment and general water quality constituents.
c
c crvfg    vsivfg    sandfg    sweepfg
        0      0       3      0
c--------------------------------------------------------------------------------------------
c445 street sweeping for sediment (read if sedfg = 1)
c
c    defid         parameter group id
c    deluid        landuse id (impervious only)
c    deluname      landuse name
c    start_month   start month of street sweeping requirement
c    end_month     end month of street sweeping requirement
c    frequency     days between street sweeping within the landuse (0 for no sweeping)
c    percent_area  fraction of land surface which is available for street sweeping (0 for no sweeping)
c    effic_sand    fraction of sand in solids storage that is available for removal by sweeping (0-1)
c    effic_silt    fraction of silt in solids storage that is available for removal by sweeping (0-1)
c    effic_clay    fraction of clay in solids storage that is available for removal by sweeping (0-1)
c
c defid   deluid   deluname   start_month   end_month   frequency   percent_area   effic_sand   effic_silt
effic_clay
c--------------------------------------------------------------------------------------------
c446 street sweeping for GQual (read if sedfg = 1 and pqalfg = 1)
c
c    defid         parameter group id
c    deluid        landuse id (impervious only)
c    deluname      landuse name
c    effic_GQual   fraction of general water quality constituent in surface storage that is available for
removal by sweeping (0-1)
c
c defid   deluid   deluname   effic_GQual1   effic_GQual2 ... effic_GQualn
c--------------------------------------------------------------------------------------------
c450 sediment parameter group 1 (read if sedfg =1)
c
c    defid   parameter group id
c    deluid  landuse id
c    smpf    supporting management practice factor
c    krer    coefficient in the soil detachment equation
c    jrer    exponent in the soil detachment equation
```

```
c    affix   fraction by which detached sediment storage decreases each day as a result of
c            soil compaction. (/day)
c    cover   fraction of land surface which is shielded from rainfall erosion
c    nvsi    rate at which sediment enters detached storage from the atmosphere (lb/ac/day)
c            negative value may be used to simulate removal by human activity or wind
c    kser    coefficient in the detached sediment washoff equation
c    jser    exponent in the detached sediment washoff equation
c    kger    coefficient in the matrix soil scour equation, which simulates gully erosion
c    jger    exponent in the matrix soil scour equation, which simulates gully erosion
c    accsdp  rate at which solids accumulate on the land surface (used in impervious land)
c    remsdp  fraction of solids storage which is removed each day when there is no runoff,
c            for example, because of street sweeping (used in impervious land)
c
c defid deluid  smpf   krer   jrer  affix  cover    nvsi  kser   jser  kger  jger   accsdp remsdp
       33      1000   1.000000       0.000000       0.000000       0.000000       0.000000       0.000000
       0.200000       1.800000       0.000000       1.000000       0.004000       0.050000
       33      2000   1.000000       0.000000       0.000000       0.000000       0.000000       0.000000
       0.200000       1.800000       0.000000       1.000000       0.003000       0.050000
       33      3000   1.000000       0.000000       0.000000       0.000000       0.000000       0.000000
       0.200000       1.800000       0.000000       1.000000       0.002000       0.050000
       33      4000   1.000000       0.000000       0.000000       0.000000       0.000000       0.000000
       0.200000       1.800000       0.000000       1.000000       0.003000       0.050000
       33      5000   1.000000       0.000000       0.000000       0.000000       0.000000       0.000000
       0.200000       1.800000       0.000000       1.000000       0.001500       0.050000
       33      6000   1.000000       0.000000       0.000000       0.000000       0.000000       0.000000
       0.200000       1.800000       0.000000       1.000000       0.003000       0.050000
       33      7000   1.000000       0.000000       0.000000       0.000000       0.000000       0.000000
       0.200000       1.800000       0.000000       1.000000       0.004000       0.050000
       33      8000   1.000000       0.000000       0.000000       0.000000       0.000000       0.000000
       0.200000       1.800000       0.000000       1.000000       0.002500       0.050000
       33      9000   1.000000       0.000000       0.000000       0.000000       0.000000       0.000000
       0.200000       1.800000       0.000000       1.000000       0.000200       0.050000
       33      10000  1.000000       0.000000       0.000000       0.000000       0.000000       0.000000
       0.000000       1.800000       0.000000       1.000000       0.000000       0.000000
       33      11111  1.000000       0.200000       2.000000       0.100000       0.900000       0.000000
       0.200000       2.000000       0.000000       1.000000       0.000000       0.000000
       33      11112  1.000000       0.200000       2.000000       0.100000       0.900000       0.000000
       0.200000       2.000000       0.000000       1.000000       0.000000       0.000000
       33      11121  1.000000       0.200000       2.000000       0.100000       0.920000       0.000000
       0.350000       2.000000       0.000000       1.000000       0.000000       0.000000
       33      11122  1.000000       0.200000       2.000000       0.100000       0.920000       0.000000
       0.350000       2.000000       0.000000       1.000000       0.000000       0.000000
       33      11211  1.000000       0.400000       2.000000       0.100000       0.900000       0.000000
       0.200000       2.000000       0.000000       1.000000       0.000000       0.000000
       33      11212  1.000000       0.400000       2.000000       0.100000       0.900000       0.000000
       0.200000       2.000000       0.000000       1.000000       0.000000       0.000000
       33      11221  1.000000       0.400000       2.000000       0.100000       0.920000       0.000000
       0.350000       2.000000       0.000000       1.000000       0.000000       0.000000
       33      11222  1.000000       0.400000       2.000000       0.100000       0.920000       0.000000
       0.350000       2.000000       0.000000       1.000000       0.000000       0.000000
       33      11311  1.000000       0.250000       2.000000       0.100000       0.900000       0.000000
       0.200000       2.000000       0.000000       1.000000       0.000000       0.000000
       33      11312  1.000000       0.250000       2.000000       0.100000       0.900000       0.000000
       0.200000       2.000000       0.000000       1.000000       0.000000       0.000000
       33      11321  1.000000       0.250000       2.000000       0.100000       0.920000       0.000000
       0.350000       2.000000       0.000000       1.000000       0.000000       0.000000
       33      11322  1.000000       0.250000       2.000000       0.100000       0.920000       0.000000
       0.350000       2.000000       0.000000       1.000000       0.000000       0.000000
       33      11411  1.000000       0.150000       2.000000       0.100000       0.900000       0.000000
       0.200000       2.000000       0.000000       1.000000       0.000000       0.000000
       33      11412  1.000000       0.150000       2.000000       0.100000       0.900000       0.000000
       0.200000       2.000000       0.000000       1.000000       0.000000       0.000000
       33      11421  1.000000       0.150000       2.000000       0.100000       0.920000       0.000000
       0.350000       2.000000       0.000000       1.000000       0.000000       0.000000
       33      11422  1.000000       0.150000       2.000000       0.100000       0.920000       0.000000
       0.350000       2.000000       0.000000       1.000000       0.000000       0.000000
       33      12111  1.000000       0.200000       2.000000       0.100000       0.900000       0.000000
       0.200000       2.000000       0.000000       1.000000       0.000000       0.000000
       33      12112  1.000000       0.200000       2.000000       0.100000       0.900000       0.000000
       0.200000       2.000000       0.000000       1.000000       0.000000       0.000000
       33      12121  1.000000       0.200000       2.000000       0.100000       0.920000       0.000000
       0.350000       2.000000       0.000000       1.000000       0.000000       0.000000
       33      12122  1.000000       0.200000       2.000000       0.100000       0.920000       0.000000
       0.350000       2.000000       0.000000       1.000000       0.000000       0.000000
       33      12211  1.000000       0.400000       2.000000       0.100000       0.900000       0.000000
       0.200000       2.000000       0.000000       1.000000       0.000000       0.000000
       33      12212  1.000000       0.400000       2.000000       0.100000       0.900000       0.000000
       0.200000       2.000000       0.000000       1.000000       0.000000       0.000000
```

```
33      12221 1.000000        0.400000       2.000000       0.100000       0.920000       0.000000
0.350000       2.000000       0.000000       1.000000       0.000000       0.000000
33      12222 1.000000        0.400000       2.000000       0.100000       0.920000       0.000000
0.350000       2.000000       0.000000       1.000000       0.000000       0.000000
33      12311 1.000000        0.250000       2.000000       0.100000       0.900000       0.000000
0.200000       2.000000       0.000000       1.000000       0.000000       0.000000
33      12312 1.000000        0.250000       2.000000       0.100000       0.900000       0.000000
0.200000       2.000000       0.000000       1.000000       0.000000       0.000000
33      12321 1.000000        0.250000       2.000000       0.100000       0.920000       0.000000
0.350000       2.000000       0.000000       1.000000       0.000000       0.000000
33      12322 1.000000        0.250000       2.000000       0.100000       0.920000       0.000000
0.350000       2.000000       0.000000       1.000000       0.000000       0.000000
33      12411 1.000000        0.110000       2.000000       0.100000       0.900000       0.000000
0.200000       2.000000       0.000000       1.000000       0.000000       0.000000
33      12412 1.000000        0.110000       2.000000       0.100000       0.900000       0.000000
0.200000       2.000000       0.000000       1.000000       0.000000       0.000000
33      12421 1.000000        0.110000       2.000000       0.100000       0.920000       0.000000
0.350000       2.000000       0.000000       1.000000       0.000000       0.000000
33      12422 1.000000        0.110000       2.000000       0.100000       0.920000       0.000000
0.350000       2.000000       0.000000       1.000000       0.000000       0.000000
33      13111 1.000000        0.150000       2.000000       0.100000       0.800000       0.000000
0.200000       2.000000       1.500000       2.500000       0.000000       0.000000
33      13112 1.000000        0.150000       2.000000       0.100000       0.800000       0.000000
0.200000       2.000000       1.500000       2.500000       0.000000       0.000000
33      13121 1.000000        0.150000       2.000000       0.100000       0.500000       0.000000
0.350000       2.000000       1.500000       2.500000       0.000000       0.000000
33      13122 1.000000        0.150000       2.000000       0.100000       0.500000       0.000000
0.350000       2.000000       1.500000       2.500000       0.000000       0.000000
33      13211 1.000000        0.200000       2.000000       0.100000       0.800000       0.000000
0.200000       2.000000       1.500000       2.500000       0.000000       0.000000
33      13212 1.000000        0.200000       2.000000       0.100000       0.800000       0.000000
0.200000       2.000000       1.500000       2.500000       0.000000       0.000000
33      13221 1.000000        0.200000       2.000000       0.100000       0.500000       0.000000
0.350000       2.000000       1.500000       2.500000       0.000000       0.000000
33      13222 1.000000        0.200000       2.000000       0.100000       0.500000       0.000000
0.350000       2.000000       1.500000       2.500000       0.000000       0.000000
33      13231 1.000000        0.200000       2.000000       0.100000       0.300000       0.000000
0.500000       2.000000       1.500000       2.500000       0.000000       0.000000
33      13232 1.000000        0.200000       2.000000       0.100000       0.300000       0.000000
0.500000       2.000000       1.500000       2.500000       0.000000       0.000000
33      13311 1.000000        0.180000       2.000000       0.100000       0.800000       0.000000
0.200000       2.000000       1.500000       2.500000       0.000000       0.000000
33      13312 1.000000        0.180000       2.000000       0.100000       0.800000       0.000000
0.200000       2.000000       1.500000       2.500000       0.000000       0.000000
33      13321 1.000000        0.180000       2.000000       0.100000       0.500000       0.000000
0.350000       2.000000       1.500000       2.500000       0.000000       0.000000
33      13322 1.000000        0.180000       2.000000       0.100000       0.500000       0.000000
0.350000       2.000000       1.500000       2.500000       0.000000       0.000000
33      13331 1.000000        0.180000       2.000000       0.100000       0.300000       0.000000
0.500000       2.000000       1.500000       2.500000       0.000000       0.000000
33      13411 1.000000        0.220000       2.000000       0.100000       0.800000       0.000000
0.200000       2.000000       1.500000       2.500000       0.000000       0.000000
33      13412 1.000000        0.220000       2.000000       0.100000       0.800000       0.000000
0.200000       2.000000       1.500000       2.500000       0.000000       0.000000
33      13421 1.000000        0.220000       2.000000       0.100000       0.500000       0.000000
0.350000       2.000000       1.500000       2.500000       0.000000       0.000000
33      13422 1.000000        0.220000       2.000000       0.100000       0.500000       0.000000
0.350000       2.000000       1.500000       2.500000       0.000000       0.000000
33      13431 1.000000        0.220000       2.000000       0.100000       0.300000       0.000000
0.500000       2.000000       1.500000       2.500000       0.000000       0.000000
33      13432 1.000000        0.220000       2.000000       0.100000       0.300000       0.000000
0.500000       2.000000       1.500000       2.500000       0.000000       0.000000
33      14121 1.000000        0.225000       2.000000       0.100000       0.700000       0.000000
0.350000       2.000000       0.750000       2.500000       0.000000       0.000000
33      14122 1.000000        0.225000       2.000000       0.100000       0.700000       0.000000
0.350000       2.000000       0.750000       2.500000       0.000000       0.000000
33      14131 1.000000        0.225000       2.000000       0.100000       0.900000       0.000000
0.500000       2.000000       0.750000       2.500000       0.000000       0.000000
33      14132 1.000000        0.225000       2.000000       0.100000       0.900000       0.000000
0.500000       2.000000       0.750000       2.500000       0.000000       0.000000
33      14221 1.000000        0.330000       2.000000       0.100000       0.700000       0.000000
0.350000       2.000000       0.750000       2.500000       0.000000       0.000000
33      14222 1.000000        0.330000       2.000000       0.100000       0.700000       0.000000
0.350000       2.000000       0.750000       2.500000       0.000000       0.000000
33      14231 1.000000        0.330000       2.000000       0.100000       0.800000       0.000000
0.500000       2.000000       0.750000       2.500000       0.000000       0.000000
33      14232 1.000000        0.330000       2.000000       0.100000       0.800000       0.000000
0.500000       2.000000       0.750000       2.500000       0.000000       0.000000
```

```
33      14321  1.000000       0.405000       2.000000       0.100000       0.700000       0.000000
0.350000       2.000000       0.750000       2.500000       0.000000       0.000000
33      14322  1.000000       0.405000       2.000000       0.100000       0.700000       0.000000
0.350000       2.000000       0.750000       2.500000       0.000000       0.000000
33      14331  1.000000       0.405000       2.000000       0.100000       0.600000       0.000000
0.500000       2.000000       0.750000       2.500000       0.000000       0.000000
33      14332  1.000000       0.405000       2.000000       0.100000       0.600000       0.000000
0.500000       2.000000       0.750000       2.500000       0.000000       0.000000
33      14421  1.000000       0.330000       2.000000       0.100000       0.700000       0.000000
0.350000       2.000000       0.750000       2.500000       0.000000       0.000000
33      14422  1.000000       0.330000       2.000000       0.100000       0.700000       0.000000
0.350000       2.000000       0.750000       2.500000       0.000000       0.000000
33      14431  1.000000       0.330000       2.000000       0.100000       0.600000       0.000000
0.500000       2.000000       0.750000       2.500000       0.000000       0.000000
33      14432  1.000000       0.330000       2.000000       0.100000       0.600000       0.000000
0.500000       2.000000       0.750000       2.500000       0.000000       0.000000
33      15121  1.000000       0.075000       2.000000       0.100000       0.700000       0.000000
0.350000       2.000000       0.375000       2.500000       0.000000       0.000000
33      15122  1.000000       0.075000       2.000000       0.100000       0.700000       0.000000
0.350000       2.000000       0.375000       2.500000       0.000000       0.000000
33      15131  1.000000       0.075000       2.000000       0.100000       0.900000       0.000000
0.500000       2.000000       0.375000       2.500000       0.000000       0.000000
33      15132  1.000000       0.075000       2.000000       0.100000       0.900000       0.000000
0.500000       2.000000       0.375000       2.500000       0.000000       0.000000
33      15221  1.000000       0.110000       2.000000       0.100000       0.700000       0.000000
0.350000       2.000000       0.375000       2.500000       0.000000       0.000000
33      15222  1.000000       0.110000       2.000000       0.100000       0.700000       0.000000
0.350000       2.000000       0.375000       2.500000       0.000000       0.000000
33      15231  1.000000       0.110000       2.000000       0.100000       0.800000       0.000000
0.500000       2.000000       0.375000       2.500000       0.000000       0.000000
33      15232  1.000000       0.110000       2.000000       0.100000       0.800000       0.000000
0.500000       2.000000       0.375000       2.500000       0.000000       0.000000
33      15321  1.000000       0.135000       2.000000       0.100000       0.700000       0.000000
0.350000       2.000000       0.375000       2.500000       0.000000       0.000000
33      15322  1.000000       0.135000       2.000000       0.100000       0.700000       0.000000
0.350000       2.000000       0.375000       2.500000       0.000000       0.000000
33      15331  1.000000       0.135000       2.000000       0.100000       0.700000       0.000000
0.500000       2.000000       0.375000       2.500000       0.000000       0.000000
33      15332  1.000000       0.135000       2.000000       0.100000       0.700000       0.000000
0.500000       2.000000       0.375000       2.500000       0.000000       0.000000
33      15421  1.000000       0.011000       2.000000       0.100000       0.700000       0.000000
0.350000       2.000000       0.075000       2.500000       0.000000       0.000000
33      15422  1.000000       0.011000       2.000000       0.100000       0.700000       0.000000
0.350000       2.000000       0.075000       2.500000       0.000000       0.000000
33      15431  1.000000       0.011000       2.000000       0.100000       0.900000       0.000000
0.500000       2.000000       0.075000       2.500000       0.000000       0.000000
33      15432  1.000000       0.011000       2.000000       0.100000       0.900000       0.000000
0.500000       2.000000       0.075000       2.500000       0.000000       0.000000
33      16000  1.000000       0.000000       2.000000       0.100000       0.000000       0.000000
0.000000       2.000000       0.000000       1.000000       0.000000       0.000000
40      1000   1.000000       0.000000       0.000000       0.000000       0.000000       0.000000
0.200000       1.800000       0.000000       1.000000       0.004000       0.050000
40      2000   1.000000       0.000000       0.000000       0.000000       0.000000       0.000000
0.200000       1.800000       0.000000       1.000000       0.003000       0.050000
40      3000   1.000000       0.000000       0.000000       0.000000       0.000000       0.000000
0.200000       1.800000       0.000000       1.000000       0.002000       0.050000
40      4000   1.000000       0.000000       0.000000       0.000000       0.000000       0.000000
0.200000       1.800000       0.000000       1.000000       0.003000       0.050000
40      5000   1.000000       0.000000       0.000000       0.000000       0.000000       0.000000
0.200000       1.800000       0.000000       1.000000       0.001500       0.050000
40      6000   1.000000       0.000000       0.000000       0.000000       0.000000       0.000000
0.200000       1.800000       0.000000       1.000000       0.003000       0.050000
40      7000   1.000000       0.000000       0.000000       0.000000       0.000000       0.000000
0.200000       1.800000       0.000000       1.000000       0.004000       0.050000
40      8000   1.000000       0.000000       0.000000       0.000000       0.000000       0.000000
0.200000       1.800000       0.000000       1.000000       0.002500       0.050000
40      9000   1.000000       0.000000       0.000000       0.000000       0.000000       0.000000
0.200000       1.800000       0.000000       1.000000       0.000200       0.050000
40      10000  1.000000       0.000000       0.000000       0.000000       0.000000       0.000000
0.000000       1.800000       0.000000       1.000000       0.000000       0.000000
40      11111  1.000000       0.200000       2.000000       0.100000       0.900000       0.000000
0.200000       2.000000       0.000000       1.000000       0.000000       0.000000
40      11112  1.000000       0.200000       2.000000       0.100000       0.900000       0.000000
0.200000       2.000000       0.000000       1.000000       0.000000       0.000000
40      11121  1.000000       0.200000       2.000000       0.100000       0.920000       0.000000
0.350000       2.000000       0.000000       1.000000       0.000000       0.000000
40      11122  1.000000       0.200000       2.000000       0.100000       0.920000       0.000000
0.350000       2.000000       0.000000       1.000000       0.000000       0.000000
```

```
40      11211  1.000000       0.400000       2.000000       0.100000       0.900000       0.000000
0.200000       2.000000       0.000000       1.000000       0.000000       0.000000
40      11212  1.000000       0.400000       2.000000       0.100000       0.900000       0.000000
0.200000       2.000000       0.000000       1.000000       0.000000       0.000000
40      11221  1.000000       0.400000       2.000000       0.100000       0.920000       0.000000
0.350000       2.000000       0.000000       1.000000       0.000000       0.000000
40      11222  1.000000       0.400000       2.000000       0.100000       0.920000       0.000000
0.350000       2.000000       0.000000       1.000000       0.000000       0.000000
40      11311  1.000000       0.250000       2.000000       0.100000       0.900000       0.000000
0.200000       2.000000       0.000000       1.000000       0.000000       0.000000
40      11312  1.000000       0.250000       2.000000       0.100000       0.900000       0.000000
0.200000       2.000000       0.000000       1.000000       0.000000       0.000000
40      11321  1.000000       0.250000       2.000000       0.100000       0.920000       0.000000
0.350000       2.000000       0.000000       1.000000       0.000000       0.000000
40      11322  1.000000       0.250000       2.000000       0.100000       0.920000       0.000000
0.350000       2.000000       0.000000       1.000000       0.000000       0.000000
40      11411  1.000000       0.150000       2.000000       0.100000       0.900000       0.000000
0.200000       2.000000       0.000000       1.000000       0.000000       0.000000
40      11412  1.000000       0.150000       2.000000       0.100000       0.900000       0.000000
0.200000       2.000000       0.000000       1.000000       0.000000       0.000000
40      11421  1.000000       0.150000       2.000000       0.100000       0.920000       0.000000
0.350000       2.000000       0.000000       1.000000       0.000000       0.000000
40      11422  1.000000       0.150000       2.000000       0.100000       0.920000       0.000000
0.350000       2.000000       0.000000       1.000000       0.000000       0.000000
40      12111  1.000000       0.200000       2.000000       0.100000       0.900000       0.000000
0.200000       2.000000       0.000000       1.000000       0.000000       0.000000
40      12112  1.000000       0.200000       2.000000       0.100000       0.900000       0.000000
0.200000       2.000000       0.000000       1.000000       0.000000       0.000000
40      12121  1.000000       0.200000       2.000000       0.100000       0.920000       0.000000
0.350000       2.000000       0.000000       1.000000       0.000000       0.000000
40      12122  1.000000       0.200000       2.000000       0.100000       0.920000       0.000000
0.350000       2.000000       0.000000       1.000000       0.000000       0.000000
40      12211  1.000000       0.400000       2.000000       0.100000       0.900000       0.000000
0.200000       2.000000       0.000000       1.000000       0.000000       0.000000
40      12212  1.000000       0.400000       2.000000       0.100000       0.900000       0.000000
0.200000       2.000000       0.000000       1.000000       0.000000       0.000000
40      12221  1.000000       0.400000       2.000000       0.100000       0.920000       0.000000
0.350000       2.000000       0.000000       1.000000       0.000000       0.000000
40      12222  1.000000       0.400000       2.000000       0.100000       0.920000       0.000000
0.350000       2.000000       0.000000       1.000000       0.000000       0.000000
40      12311  1.000000       0.250000       2.000000       0.100000       0.900000       0.000000
0.200000       2.000000       0.000000       1.000000       0.000000       0.000000
40      12312  1.000000       0.250000       2.000000       0.100000       0.900000       0.000000
0.200000       2.000000       0.000000       1.000000       0.000000       0.000000
40      12321  1.000000       0.250000       2.000000       0.100000       0.920000       0.000000
0.350000       2.000000       0.000000       1.000000       0.000000       0.000000
40      12322  1.000000       0.250000       2.000000       0.100000       0.920000       0.000000
0.350000       2.000000       0.000000       1.000000       0.000000       0.000000
40      12411  1.000000       0.110000       2.000000       0.100000       0.900000       0.000000
0.200000       2.000000       0.000000       1.000000       0.000000       0.000000
40      12412  1.000000       0.110000       2.000000       0.100000       0.900000       0.000000
0.200000       2.000000       0.000000       1.000000       0.000000       0.000000
40      12421  1.000000       0.110000       2.000000       0.100000       0.920000       0.000000
0.350000       2.000000       0.000000       1.000000       0.000000       0.000000
40      12422  1.000000       0.110000       2.000000       0.100000       0.920000       0.000000
0.350000       2.000000       0.000000       1.000000       0.000000       0.000000
40      13111  1.000000       0.150000       2.000000       0.100000       0.800000       0.000000
0.200000       2.000000       1.500000       2.500000       0.000000       0.000000
40      13112  1.000000       0.150000       2.000000       0.100000       0.800000       0.000000
0.200000       2.000000       1.500000       2.500000       0.000000       0.000000
40      13121  1.000000       0.150000       2.000000       0.100000       0.500000       0.000000
0.350000       2.000000       1.500000       2.500000       0.000000       0.000000
40      13122  1.000000       0.150000       2.000000       0.100000       0.500000       0.000000
0.350000       2.000000       1.500000       2.500000       0.000000       0.000000
40      13211  1.000000       0.200000       2.000000       0.100000       0.800000       0.000000
0.200000       2.000000       1.500000       2.500000       0.000000       0.000000
40      13212  1.000000       0.200000       2.000000       0.100000       0.800000       0.000000
0.200000       2.000000       1.500000       2.500000       0.000000       0.000000
40      13221  1.000000       0.200000       2.000000       0.100000       0.500000       0.000000
0.350000       2.000000       1.500000       2.500000       0.000000       0.000000
40      13222  1.000000       0.200000       2.000000       0.100000       0.500000       0.000000
0.350000       2.000000       1.500000       2.500000       0.000000       0.000000
40      13231  1.000000       0.200000       2.000000       0.100000       0.300000       0.000000
0.500000       2.000000       1.500000       2.500000       0.000000       0.000000
40      13232  1.000000       0.200000       2.000000       0.100000       0.300000       0.000000
0.500000       2.000000       1.500000       2.500000       0.000000       0.000000
40      13311  1.000000       0.180000       2.000000       0.100000       0.800000       0.000000
0.200000       2.000000       1.500000       2.500000       0.000000       0.000000
```

```
40      13312  1.000000       0.180000       2.000000       0.100000       0.800000       0.000000
0.200000       2.000000       1.500000       2.500000       0.000000       0.000000
40      13321  1.000000       0.180000       2.000000       0.100000       0.500000       0.000000
0.350000       2.000000       1.500000       2.500000       0.000000       0.000000
40      13322  1.000000       0.180000       2.000000       0.100000       0.500000       0.000000
0.350000       2.000000       1.500000       2.500000       0.000000       0.000000
40      13331  1.000000       0.180000       2.000000       0.100000       0.300000       0.000000
0.500000       2.000000       1.500000       2.500000       0.000000       0.000000
40      13411  1.000000       0.220000       2.000000       0.100000       0.800000       0.000000
0.200000       2.000000       1.500000       2.500000       0.000000       0.000000
40      13412  1.000000       0.220000       2.000000       0.100000       0.800000       0.000000
0.200000       2.000000       1.500000       2.500000       0.000000       0.000000
40      13421  1.000000       0.220000       2.000000       0.100000       0.500000       0.000000
0.350000       2.000000       1.500000       2.500000       0.000000       0.000000
40      13422  1.000000       0.220000       2.000000       0.100000       0.500000       0.000000
0.350000       2.000000       1.500000       2.500000       0.000000       0.000000
40      13431  1.000000       0.220000       2.000000       0.100000       0.300000       0.000000
0.500000       2.000000       1.500000       2.500000       0.000000       0.000000
40      13432  1.000000       0.220000       2.000000       0.100000       0.300000       0.000000
0.500000       2.000000       1.500000       2.500000       0.000000       0.000000
40      14121  1.000000       0.225000       2.000000       0.100000       0.700000       0.000000
0.350000       2.000000       0.750000       2.500000       0.000000       0.000000
40      14122  1.000000       0.225000       2.000000       0.100000       0.700000       0.000000
0.350000       2.000000       0.750000       2.500000       0.000000       0.000000
40      14131  1.000000       0.225000       2.000000       0.100000       0.900000       0.000000
0.500000       2.000000       0.750000       2.500000       0.000000       0.000000
40      14132  1.000000       0.225000       2.000000       0.100000       0.900000       0.000000
0.500000       2.000000       0.750000       2.500000       0.000000       0.000000
40      14221  1.000000       0.330000       2.000000       0.100000       0.700000       0.000000
0.350000       2.000000       0.750000       2.500000       0.000000       0.000000
40      14222  1.000000       0.330000       2.000000       0.100000       0.700000       0.000000
0.350000       2.000000       0.750000       2.500000       0.000000       0.000000
40      14231  1.000000       0.330000       2.000000       0.100000       0.800000       0.000000
0.500000       2.000000       0.750000       2.500000       0.000000       0.000000
40      14232  1.000000       0.330000       2.000000       0.100000       0.800000       0.000000
0.500000       2.000000       0.750000       2.500000       0.000000       0.000000
40      14321  1.000000       0.405000       2.000000       0.100000       0.700000       0.000000
0.350000       2.000000       0.750000       2.500000       0.000000       0.000000
40      14322  1.000000       0.405000       2.000000       0.100000       0.700000       0.000000
0.350000       2.000000       0.750000       2.500000       0.000000       0.000000
40      14331  1.000000       0.405000       2.000000       0.100000       0.600000       0.000000
0.500000       2.000000       0.750000       2.500000       0.000000       0.000000
40      14332  1.000000       0.405000       2.000000       0.100000       0.600000       0.000000
0.500000       2.000000       0.750000       2.500000       0.000000       0.000000
40      14421  1.000000       0.330000       2.000000       0.100000       0.700000       0.000000
0.350000       2.000000       0.750000       2.500000       0.000000       0.000000
40      14422  1.000000       0.330000       2.000000       0.100000       0.700000       0.000000
0.350000       2.000000       0.750000       2.500000       0.000000       0.000000
40      14431  1.000000       0.330000       2.000000       0.100000       0.600000       0.000000
0.500000       2.000000       0.750000       2.500000       0.000000       0.000000
40      14432  1.000000       0.330000       2.000000       0.100000       0.600000       0.000000
0.500000       2.000000       0.750000       2.500000       0.000000       0.000000
40      15121  1.000000       0.075000       2.000000       0.100000       0.700000       0.000000
0.350000       2.000000       0.375000       2.500000       0.000000       0.000000
40      15122  1.000000       0.075000       2.000000       0.100000       0.700000       0.000000
0.350000       2.000000       0.375000       2.500000       0.000000       0.000000
40      15131  1.000000       0.075000       2.000000       0.100000       0.900000       0.000000
0.500000       2.000000       0.375000       2.500000       0.000000       0.000000
40      15132  1.000000       0.075000       2.000000       0.100000       0.900000       0.000000
0.500000       2.000000       0.375000       2.500000       0.000000       0.000000
40      15221  1.000000       0.110000       2.000000       0.100000       0.700000       0.000000
0.350000       2.000000       0.375000       2.500000       0.000000       0.000000
40      15222  1.000000       0.110000       2.000000       0.100000       0.700000       0.000000
0.350000       2.000000       0.375000       2.500000       0.000000       0.000000
40      15231  1.000000       0.110000       2.000000       0.100000       0.800000       0.000000
0.500000       2.000000       0.375000       2.500000       0.000000       0.000000
40      15232  1.000000       0.110000       2.000000       0.100000       0.800000       0.000000
0.500000       2.000000       0.375000       2.500000       0.000000       0.000000
40      15321  1.000000       0.135000       2.000000       0.100000       0.700000       0.000000
0.350000       2.000000       0.375000       2.500000       0.000000       0.000000
40      15322  1.000000       0.135000       2.000000       0.100000       0.700000       0.000000
0.350000       2.000000       0.375000       2.500000       0.000000       0.000000
40      15331  1.000000       0.135000       2.000000       0.100000       0.700000       0.000000
0.500000       2.000000       0.375000       2.500000       0.000000       0.000000
40      15332  1.000000       0.135000       2.000000       0.100000       0.700000       0.000000
0.500000       2.000000       0.375000       2.500000       0.000000       0.000000
40      15421  1.000000       0.011000       2.000000       0.100000       0.700000       0.000000
0.350000       2.000000       0.075000       2.500000       0.000000       0.000000
```

```
       40      15422  1.000000       0.011000       2.000000       0.100000       0.700000       0.000000
       0.350000       2.000000       0.075000       2.500000       0.000000       0.000000
       40      15431  1.000000       0.011000       2.000000       0.100000       0.900000       0.000000
       0.500000       2.000000       0.075000       2.500000       0.000000       0.000000
       40      15432  1.000000       0.011000       2.000000       0.100000       0.900000       0.000000
       0.500000       2.000000       0.075000       2.500000       0.000000       0.000000
       40      16000  1.000000       0.000000       2.000000       0.100000       0.000000       0.000000
       0.000000       2.000000       0.000000       1.000000       0.000000       0.000000
c-------------------------------------------------------------------------------------------
c451 sediment parameter group 2 (read if sedfg =1)
c
c    defid     parameter group id
c    deluid    landuse id
c    sed-suro  background concentration associated with surface flow (mg/l)
c    sed-ifwo  background concentration associated with interflow outflow (mg/l)
c    sed-agwo  background concentration associated with groundwater outflow (mg/l)
c    sed_i     fraction of sediment class_i (sand, silt, and clay)
c
c    (sand + silt + clay = 1)
c    Background sediment load is added to total sediment from LAND prior to applying fractions
c
c defid   deluid    sed_suro   sed_ifwo   sed_agwo   sed_1   sed_2   sed_3 ........sed_n
       33      1000   0.000000       0.000000       0.000000       0.100000       0.700000       0.200000
       33      2000   0.000000       0.000000       0.000000       0.100000       0.700000       0.200000
       33      3000   0.000000       0.000000       0.000000       0.100000       0.700000       0.200000
       33      4000   0.000000       0.000000       0.000000       0.100000       0.700000       0.200000
       33      5000   0.000000       0.000000       0.000000       0.100000       0.700000       0.200000
       33      6000   0.000000       0.000000       0.000000       0.100000       0.700000       0.200000
       33      7000   0.000000       0.000000       0.000000       0.100000       0.700000       0.200000
       33      8000   0.000000       0.000000       0.000000       0.100000       0.700000       0.200000
       33      9000   0.000000       0.000000       0.000000       0.100000       0.700000       0.200000
       33      10000  150.000000     0.000000       0.000000       0.100000       0.700000       0.200000
       33      11111  0.000000       1.000000       1.000000       0.700000       0.100000       0.200000
       33      11112  0.000000       1.000000       1.000000       0.700000       0.100000       0.200000
       33      11121  0.000000       1.000000       1.000000       0.700000       0.100000       0.200000
       33      11122  0.000000       1.000000       1.000000       0.700000       0.100000       0.200000
       33      11211  0.000000       1.000000       1.000000       0.200000       0.650000       0.150000
       33      11212  0.000000       1.000000       1.000000       0.200000       0.650000       0.150000
       33      11221  0.000000       1.000000       1.000000       0.200000       0.650000       0.150000
       33      11222  0.000000       1.000000       1.000000       0.200000       0.650000       0.150000
       33      11311  0.000000       1.000000       1.000000       0.500000       0.200000       0.300000
       33      11312  0.000000       1.000000       1.000000       0.500000       0.200000       0.300000
       33      11321  0.000000       1.000000       1.000000       0.500000       0.200000       0.300000
       33      11322  0.000000       1.000000       1.000000       0.500000       0.200000       0.300000
       33      11411  0.000000       1.000000       1.000000       0.600000       0.200000       0.200000
       33      11412  0.000000       1.000000       1.000000       0.600000       0.200000       0.200000
       33      11421  0.000000       1.000000       1.000000       0.600000       0.200000       0.200000
       33      11422  0.000000       1.000000       1.000000       0.600000       0.200000       0.200000
       33      12111  0.000000       1.000000       1.000000       0.700000       0.100000       0.200000
       33      12112  0.000000       1.000000       1.000000       0.700000       0.100000       0.200000
       33      12121  0.000000       1.000000       1.000000       0.700000       0.100000       0.200000
       33      12122  0.000000       1.000000       1.000000       0.700000       0.100000       0.200000
       33      12211  0.000000       1.000000       1.000000       0.200000       0.650000       0.150000
       33      12212  0.000000       1.000000       1.000000       0.200000       0.650000       0.150000
       33      12221  0.000000       1.000000       1.000000       0.200000       0.650000       0.150000
       33      12222  0.000000       1.000000       1.000000       0.200000       0.650000       0.150000
       33      12311  0.000000       1.000000       1.000000       0.500000       0.200000       0.300000
       33      12312  0.000000       1.000000       1.000000       0.500000       0.200000       0.300000
       33      12321  0.000000       1.000000       1.000000       0.500000       0.200000       0.300000
       33      12322  0.000000       1.000000       1.000000       0.500000       0.200000       0.300000
       33      12411  0.000000       1.000000       1.000000       0.600000       0.200000       0.200000
       33      12412  0.000000       1.000000       1.000000       0.600000       0.200000       0.200000
       33      12421  0.000000       1.000000       1.000000       0.600000       0.200000       0.200000
       33      12422  0.000000       1.000000       1.000000       0.600000       0.200000       0.200000
       33      13111  0.000000       1.000000       1.000000       0.700000       0.100000       0.200000
       33      13112  0.000000       1.000000       1.000000       0.700000       0.100000       0.200000
       33      13121  0.000000       1.000000       1.000000       0.700000       0.100000       0.200000
       33      13122  0.000000       1.000000       1.000000       0.700000       0.100000       0.200000
       33      13211  0.000000       1.000000       1.000000       0.200000       0.650000       0.150000
       33      13212  0.000000       1.000000       1.000000       0.200000       0.650000       0.150000
       33      13221  0.000000       1.000000       1.000000       0.200000       0.650000       0.150000
       33      13222  0.000000       1.000000       1.000000       0.200000       0.650000       0.150000
       33      13231  0.000000       1.000000       1.000000       0.200000       0.650000       0.150000
       33      13232  0.000000       1.000000       1.000000       0.200000       0.650000       0.150000
       33      13311  0.000000       1.000000       1.000000       0.500000       0.200000       0.300000
       33      13312  0.000000       1.000000       1.000000       0.500000       0.200000       0.300000
       33      13321  0.000000       1.000000       1.000000       0.500000       0.200000       0.300000
       33      13322  0.000000       1.000000       1.000000       0.500000       0.200000       0.300000
       33      13331  0.000000       1.000000       1.000000       0.500000       0.200000       0.300000
```

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 33 | 13411 | 0.000000 | 1.000000 | 1.000000 | 0.600000 | 0.200000 | 0.200000 |
| 33 | 13412 | 0.000000 | 1.000000 | 1.000000 | 0.600000 | 0.200000 | 0.200000 |
| 33 | 13421 | 0.000000 | 1.000000 | 1.000000 | 0.600000 | 0.200000 | 0.200000 |
| 33 | 13422 | 0.000000 | 1.000000 | 1.000000 | 0.600000 | 0.200000 | 0.200000 |
| 33 | 13431 | 0.000000 | 1.000000 | 1.000000 | 0.600000 | 0.200000 | 0.200000 |
| 33 | 13432 | 0.000000 | 1.000000 | 1.000000 | 0.600000 | 0.200000 | 0.200000 |
| 33 | 14121 | 0.000000 | 1.000000 | 1.000000 | 0.700000 | 0.100000 | 0.200000 |
| 33 | 14122 | 0.000000 | 1.000000 | 1.000000 | 0.700000 | 0.100000 | 0.200000 |
| 33 | 14131 | 0.000000 | 1.000000 | 1.000000 | 0.700000 | 0.100000 | 0.200000 |
| 33 | 14132 | 0.000000 | 1.000000 | 1.000000 | 0.700000 | 0.100000 | 0.200000 |
| 33 | 14221 | 0.000000 | 1.000000 | 1.000000 | 0.200000 | 0.650000 | 0.150000 |
| 33 | 14222 | 0.000000 | 1.000000 | 1.000000 | 0.200000 | 0.650000 | 0.150000 |
| 33 | 14231 | 0.000000 | 1.000000 | 1.000000 | 0.200000 | 0.650000 | 0.150000 |
| 33 | 14232 | 0.000000 | 1.000000 | 1.000000 | 0.200000 | 0.650000 | 0.150000 |
| 33 | 14321 | 0.000000 | 1.000000 | 1.000000 | 0.500000 | 0.200000 | 0.300000 |
| 33 | 14322 | 0.000000 | 1.000000 | 1.000000 | 0.500000 | 0.200000 | 0.300000 |
| 33 | 14331 | 0.000000 | 1.000000 | 1.000000 | 0.500000 | 0.200000 | 0.300000 |
| 33 | 14332 | 0.000000 | 1.000000 | 1.000000 | 0.500000 | 0.200000 | 0.300000 |
| 33 | 14421 | 0.000000 | 1.000000 | 1.000000 | 0.600000 | 0.200000 | 0.200000 |
| 33 | 14422 | 0.000000 | 1.000000 | 1.000000 | 0.600000 | 0.200000 | 0.200000 |
| 33 | 14431 | 0.000000 | 1.000000 | 1.000000 | 0.600000 | 0.200000 | 0.200000 |
| 33 | 14432 | 0.000000 | 1.000000 | 1.000000 | 0.600000 | 0.200000 | 0.200000 |
| 33 | 15121 | 0.000000 | 1.000000 | 1.000000 | 0.700000 | 0.100000 | 0.200000 |
| 33 | 15122 | 0.000000 | 1.000000 | 1.000000 | 0.700000 | 0.100000 | 0.200000 |
| 33 | 15131 | 0.000000 | 1.000000 | 1.000000 | 0.700000 | 0.100000 | 0.200000 |
| 33 | 15132 | 0.000000 | 1.000000 | 1.000000 | 0.700000 | 0.100000 | 0.200000 |
| 33 | 15221 | 0.000000 | 1.000000 | 1.000000 | 0.200000 | 0.650000 | 0.150000 |
| 33 | 15222 | 0.000000 | 1.000000 | 1.000000 | 0.200000 | 0.650000 | 0.150000 |
| 33 | 15231 | 0.000000 | 1.000000 | 1.000000 | 0.200000 | 0.650000 | 0.150000 |
| 33 | 15232 | 0.000000 | 1.000000 | 1.000000 | 0.200000 | 0.650000 | 0.150000 |
| 33 | 15321 | 0.000000 | 1.000000 | 1.000000 | 0.500000 | 0.200000 | 0.300000 |
| 33 | 15322 | 0.000000 | 1.000000 | 1.000000 | 0.500000 | 0.200000 | 0.300000 |
| 33 | 15331 | 0.000000 | 1.000000 | 1.000000 | 0.500000 | 0.200000 | 0.300000 |
| 33 | 15332 | 0.000000 | 1.000000 | 1.000000 | 0.500000 | 0.200000 | 0.300000 |
| 33 | 15421 | 0.000000 | 1.000000 | 1.000000 | 0.600000 | 0.200000 | 0.200000 |
| 33 | 15422 | 0.000000 | 1.000000 | 1.000000 | 0.600000 | 0.200000 | 0.200000 |
| 33 | 15431 | 0.000000 | 1.000000 | 1.000000 | 0.600000 | 0.200000 | 0.200000 |
| 33 | 15432 | 0.000000 | 1.000000 | 1.000000 | 0.600000 | 0.200000 | 0.200000 |
| 33 | 16000 | 0.000000 | 0.000000 | 0.000000 | 0.000000 | 0.000000 | 0.000000 |
| 40 | 1000 | 0.000000 | 0.000000 | 0.000000 | 0.100000 | 0.700000 | 0.200000 |
| 40 | 2000 | 0.000000 | 0.000000 | 0.000000 | 0.100000 | 0.700000 | 0.200000 |
| 40 | 3000 | 0.000000 | 0.000000 | 0.000000 | 0.100000 | 0.700000 | 0.200000 |
| 40 | 4000 | 0.000000 | 0.000000 | 0.000000 | 0.100000 | 0.700000 | 0.200000 |
| 40 | 5000 | 0.000000 | 0.000000 | 0.000000 | 0.100000 | 0.700000 | 0.200000 |
| 40 | 6000 | 0.000000 | 0.000000 | 0.000000 | 0.100000 | 0.700000 | 0.200000 |
| 40 | 7000 | 0.000000 | 0.000000 | 0.000000 | 0.100000 | 0.700000 | 0.200000 |
| 40 | 8000 | 0.000000 | 0.000000 | 0.000000 | 0.100000 | 0.700000 | 0.200000 |
| 40 | 9000 | 0.000000 | 0.000000 | 0.000000 | 0.100000 | 0.700000 | 0.200000 |
| 40 | 10000 | 150.000000 | 0.000000 | 0.000000 | 0.100000 | 0.700000 | 0.200000 |
| 40 | 11111 | 0.000000 | 1.000000 | 1.000000 | 0.700000 | 0.100000 | 0.200000 |
| 40 | 11112 | 0.000000 | 1.000000 | 1.000000 | 0.700000 | 0.100000 | 0.200000 |
| 40 | 11121 | 0.000000 | 1.000000 | 1.000000 | 0.700000 | 0.100000 | 0.200000 |
| 40 | 11122 | 0.000000 | 1.000000 | 1.000000 | 0.700000 | 0.100000 | 0.200000 |
| 40 | 11211 | 0.000000 | 1.000000 | 1.000000 | 0.200000 | 0.650000 | 0.150000 |
| 40 | 11212 | 0.000000 | 1.000000 | 1.000000 | 0.200000 | 0.650000 | 0.150000 |
| 40 | 11221 | 0.000000 | 1.000000 | 1.000000 | 0.200000 | 0.650000 | 0.150000 |
| 40 | 11222 | 0.000000 | 1.000000 | 1.000000 | 0.200000 | 0.650000 | 0.150000 |
| 40 | 11311 | 0.000000 | 1.000000 | 1.000000 | 0.500000 | 0.200000 | 0.300000 |
| 40 | 11312 | 0.000000 | 1.000000 | 1.000000 | 0.500000 | 0.200000 | 0.300000 |
| 40 | 11321 | 0.000000 | 1.000000 | 1.000000 | 0.500000 | 0.200000 | 0.300000 |
| 40 | 11322 | 0.000000 | 1.000000 | 1.000000 | 0.500000 | 0.200000 | 0.300000 |
| 40 | 11411 | 0.000000 | 1.000000 | 1.000000 | 0.600000 | 0.200000 | 0.200000 |
| 40 | 11412 | 0.000000 | 1.000000 | 1.000000 | 0.600000 | 0.200000 | 0.200000 |
| 40 | 11421 | 0.000000 | 1.000000 | 1.000000 | 0.600000 | 0.200000 | 0.200000 |
| 40 | 11422 | 0.000000 | 1.000000 | 1.000000 | 0.600000 | 0.200000 | 0.200000 |
| 40 | 12111 | 0.000000 | 1.000000 | 1.000000 | 0.700000 | 0.100000 | 0.200000 |
| 40 | 12112 | 0.000000 | 1.000000 | 1.000000 | 0.700000 | 0.100000 | 0.200000 |
| 40 | 12121 | 0.000000 | 1.000000 | 1.000000 | 0.700000 | 0.100000 | 0.200000 |
| 40 | 12122 | 0.000000 | 1.000000 | 1.000000 | 0.700000 | 0.100000 | 0.200000 |
| 40 | 12211 | 0.000000 | 1.000000 | 1.000000 | 0.200000 | 0.650000 | 0.150000 |
| 40 | 12212 | 0.000000 | 1.000000 | 1.000000 | 0.200000 | 0.650000 | 0.150000 |
| 40 | 12221 | 0.000000 | 1.000000 | 1.000000 | 0.200000 | 0.650000 | 0.150000 |
| 40 | 12222 | 0.000000 | 1.000000 | 1.000000 | 0.200000 | 0.650000 | 0.150000 |
| 40 | 12311 | 0.000000 | 1.000000 | 1.000000 | 0.500000 | 0.200000 | 0.300000 |
| 40 | 12312 | 0.000000 | 1.000000 | 1.000000 | 0.500000 | 0.200000 | 0.300000 |
| 40 | 12321 | 0.000000 | 1.000000 | 1.000000 | 0.500000 | 0.200000 | 0.300000 |
| 40 | 12322 | 0.000000 | 1.000000 | 1.000000 | 0.500000 | 0.200000 | 0.300000 |
| 40 | 12411 | 0.000000 | 1.000000 | 1.000000 | 0.600000 | 0.200000 | 0.200000 |
| 40 | 12412 | 0.000000 | 1.000000 | 1.000000 | 0.600000 | 0.200000 | 0.200000 |

```
       40      12421  0.000000       1.000000       1.000000       0.600000       0.200000       0.200000
       40      12422  0.000000       1.000000       1.000000       0.600000       0.200000       0.200000
       40      13111  0.000000       1.000000       1.000000       0.700000       0.100000       0.200000
       40      13112  0.000000       1.000000       1.000000       0.700000       0.100000       0.200000
       40      13121  0.000000       1.000000       1.000000       0.700000       0.100000       0.200000
       40      13122  0.000000       1.000000       1.000000       0.700000       0.100000       0.200000
       40      13211  0.000000       1.000000       1.000000       0.200000       0.650000       0.150000
       40      13212  0.000000       1.000000       1.000000       0.200000       0.650000       0.150000
       40      13221  0.000000       1.000000       1.000000       0.200000       0.650000       0.150000
       40      13222  0.000000       1.000000       1.000000       0.200000       0.650000       0.150000
       40      13231  0.000000       1.000000       1.000000       0.200000       0.650000       0.150000
       40      13232  0.000000       1.000000       1.000000       0.200000       0.650000       0.150000
       40      13311  0.000000       1.000000       1.000000       0.500000       0.200000       0.300000
       40      13312  0.000000       1.000000       1.000000       0.500000       0.200000       0.300000
       40      13321  0.000000       1.000000       1.000000       0.500000       0.200000       0.300000
       40      13322  0.000000       1.000000       1.000000       0.500000       0.200000       0.300000
       40      13331  0.000000       1.000000       1.000000       0.500000       0.200000       0.300000
       40      13411  0.000000       1.000000       1.000000       0.600000       0.200000       0.200000
       40      13412  0.000000       1.000000       1.000000       0.600000       0.200000       0.200000
       40      13421  0.000000       1.000000       1.000000       0.600000       0.200000       0.200000
       40      13422  0.000000       1.000000       1.000000       0.600000       0.200000       0.200000
       40      13431  0.000000       1.000000       1.000000       0.600000       0.200000       0.200000
       40      13432  0.000000       1.000000       1.000000       0.600000       0.200000       0.200000
       40      14121  0.000000       1.000000       1.000000       0.700000       0.100000       0.200000
       40      14122  0.000000       1.000000       1.000000       0.700000       0.100000       0.200000
       40      14131  0.000000       1.000000       1.000000       0.700000       0.100000       0.200000
       40      14132  0.000000       1.000000       1.000000       0.700000       0.100000       0.200000
       40      14221  0.000000       1.000000       1.000000       0.200000       0.650000       0.150000
       40      14222  0.000000       1.000000       1.000000       0.200000       0.650000       0.150000
       40      14231  0.000000       1.000000       1.000000       0.200000       0.650000       0.150000
       40      14232  0.000000       1.000000       1.000000       0.200000       0.650000       0.150000
       40      14321  0.000000       1.000000       1.000000       0.500000       0.200000       0.300000
       40      14322  0.000000       1.000000       1.000000       0.500000       0.200000       0.300000
       40      14331  0.000000       1.000000       1.000000       0.500000       0.200000       0.300000
       40      14332  0.000000       1.000000       1.000000       0.500000       0.200000       0.300000
       40      14421  0.000000       1.000000       1.000000       0.600000       0.200000       0.200000
       40      14422  0.000000       1.000000       1.000000       0.600000       0.200000       0.200000
       40      14431  0.000000       1.000000       1.000000       0.600000       0.200000       0.200000
       40      14432  0.000000       1.000000       1.000000       0.600000       0.200000       0.200000
       40      15121  0.000000       1.000000       1.000000       0.700000       0.100000       0.200000
       40      15122  0.000000       1.000000       1.000000       0.700000       0.100000       0.200000
       40      15131  0.000000       1.000000       1.000000       0.700000       0.100000       0.200000
       40      15132  0.000000       1.000000       1.000000       0.700000       0.100000       0.200000
       40      15221  0.000000       1.000000       1.000000       0.200000       0.650000       0.150000
       40      15222  0.000000       1.000000       1.000000       0.200000       0.650000       0.150000
       40      15231  0.000000       1.000000       1.000000       0.200000       0.650000       0.150000
       40      15232  0.000000       1.000000       1.000000       0.200000       0.650000       0.150000
       40      15321  0.000000       1.000000       1.000000       0.500000       0.200000       0.300000
       40      15322  0.000000       1.000000       1.000000       0.500000       0.200000       0.300000
       40      15331  0.000000       1.000000       1.000000       0.500000       0.200000       0.300000
       40      15332  0.000000       1.000000       1.000000       0.500000       0.200000       0.300000
       40      15421  0.000000       1.000000       1.000000       0.600000       0.200000       0.200000
       40      15422  0.000000       1.000000       1.000000       0.600000       0.200000       0.200000
       40      15431  0.000000       1.000000       1.000000       0.600000       0.200000       0.200000
       40      15432  0.000000       1.000000       1.000000       0.600000       0.200000       0.200000
       40      16000  0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
c--------------------------------------------------------------------------------------------
c452 GQUAL-sediment to stream mapping (read if sediment as gqual)
c
c    defid   parameter group id
c    dwqid   general quality id
c    lutype  landuse type flow id (1 = impervious surfaceflow,
c            2 = pervious surfaceflow, 3 = pervious interflow, 4 = pervious groundflow)
c    sed_i   fraction of sediment class_i (sand, silt, and clay)
c
c defid dwqid    lutype   sed_1   sed_2   sed_3 ........sed_n
c--------------------------------------------------------------------------------------------
c453 monthly erosion-related cover values
c    only required if crvfg = 1 (see card 440)
c
c    defid   parameter group id
c    deluid  landuse id
c    jan-dec erosion-related cover values at start of each month
c
c defid deluid   jan   feb   mar   apr   may   jun   jul   aug   sep   oct   nov   dec
c------------------------------------------------------------------------------------
c454 monthly net vertical sediment input
c    only required if vsivfg = 1 (see card 440)
c
```

```
c    defid   parameter group id
c    deluid  landuse id
c    jan-dec net vertical sediment input at start of each month (lb/acre/day)
c
c defid deluid   jan   feb   mar   apr   may   jun   jul   aug   sep   oct   nov   dec
c------------------------------------------------------------------------------------
c455 sediment general parameters group 3 (read if sedfg = 1)
c    general sediment related parameters for instream transport
c
c    rgid     stream parameter group id
c    bedwid   bed width (ft) - this is constant for the entire simulation period
c    beddep   initial bed depth (ft)
c    por      porosity
c    burial   burial rate of aggregated sediment layer (in/day)
c             if burial = 0 then burial rate in card 456 is used
c
c
c rgid  bedwid  beddep  por  burial
       33      16.000000      0.250000       0.500000       0.000000
       40      16.000000      0.250000       0.500000       0.000000
c--------------------------------------------------------------------------------------------
c456 sediment parameters group 4 (read if sedfg = 1)
c    cohesive suspended sediment variables for instream transport
c
c    rgid           stream parameter group id
c    sed_id         sediment class id
c    sedflg         sediment flag indicating sediment class (0 for sand, 1 for silt, and 2 for clay)
c    sedo           initial sediment conc in fluid phase (mg/liter)
c    sedfrac        initial sediment fractions (by weight) in the bed material
c    db50/d         median diameter of the non-cohesive sediment (sand) (in) (sandfg = 1 or 2)
c                   / effective diameter of the cohesive particles (silt and clay) (in)
c    w              corresponding fall velocity of the particle in still water (in/s)
c    rho            density of the particles (gm/cm^3)
c    ksand/taucd    coefficient in the sandload power function formula (sandfg = 3)
c                   / critical bed shear stress for deposition of the cohesive particle - generally taucd <=
taucs (lb/ft^2)
c                   if tau > taucd then no deposition
c                   if tau < taucd then deposition rate approaches settling velocity, w
c    expsnd/taucs   exponent in the sandload power function formula (sandfg = 3)
c                   / critical bed shear stress for scour of the cohesive particle (lb/ft^2)
c                   if tau < taucs then no scour
c                   if tau > taucs then scour steadily increases
c    m              erodibility coefficient of the cohesive particle (lb/ft^2/day)
c    burial         burial rate of the sediment particle (in/day)
c                   it is used if burial rate in card 455 is zero
c
c
c rgid  sed_id  sedflg sedo  sedfrac  db50/d   w  rho  ksand/taucd  expsnd/taucs  m   burial
       33      1      0       0.000000       0.100000       0.010000       0.800000       2.500000
       0.100000       2.000000       0.000000       0.000000
       33      2      1       0.000000       0.700000       0.000600       0.000500       2.200000
       0.104427       0.292396       0.010000       0.000000
       33      3      2       0.000000       0.200000       0.000100       0.000050       2.000000
       0.020885       0.187969       0.050000       0.000000
       40      1      0       0.000000       0.100000       0.010000       0.800000       2.500000
       0.100000       2.000000       0.000000       0.000000
       40      2      1       0.000000       0.700000       0.000600       0.000500       2.200000
       0.016708       0.125311       0.010000       0.000000
       40      3      2       0.000000       0.200000       0.000100       0.000050       2.000000
       0.008354       0.062655       0.050000       0.000000
c--------------------------------------------------------------------------------------------
c457 Streambank erosion sediment parameters (read if sedfg = 1 and sedber = 1)
c
c    rchid   reach id
c    lber    erodible stream length (miles)
c    kber    coefficient for scour of the bank matrix soil (calibration)
c    jber    exponent for scour of the bank matrix soil (calibration)
c    qber    bank erosion flow threshold causing channel bank soil erosion (cfs)
c            if = negative then threshold flow is at the bank full depth (cfs)
c    potNH4  particulate NH4-N bank erosion potency factor for RQUAL (lb/ton-sediment)
c    potPO4  particulate PO4-P bank erosion potency factor for RQUAL (lb/ton-sediment)
c    sed_i   fraction of sediment class_i (sand, silt, and clay)
c
c rchid    lber    kber    jber    qber   potNH4   potPO4   sed_1   sed_2   sed_3 ....sed_n
c--------------------------------------------------------------------------------------------
c460 soil temperature control   (read if tempfg = 1)
c
c    msltfg  if = 1 monthly vary aslt and bslt parameters in surface flow temperature calculation
c    miftfg  if = 1 monthly vary aift and bift parameters in interflow temperature calculation
```

```
c    mgwtfg  if = 1 monthly vary agwt and bgwt parameters in ground water temperature calculation
c
c msltfg     miftfg      mgwtfg
c---------------------------------------------------------------------------------------------
c461 Soil Temperature   (read if tempfg =1)
c
c    defid   parameter group id
c    deluid  landuse id
c    tsopfg  if = 0 compute subsurface temperatures using a mean departure from air temperature plus a smoothing
factor
c            if = 1 compute subsurface temperature using regression
c            if = 2 the lower/gw layer temperature is a function of upper layer temperature instead of air
temperature
c    aslt    surface layer temperature when the air temperature 0 degrees C
c    bslt    slope of the surface layer temperature regression equation
c    aift    mean difference between interflow temperature and air temperature (C)
c    bift    smoothing factor in the interflow temperature calculation
c    agwt    mean difference between groundwater temperature and air temperature (C)
c    bgwt    smoothing factor in the groundwater temperature calculation
c    islt    initial surface flow temperature (C)
c    iift    initial interflow temperature (C)
c    igwt    initial groundwater temperature (C)
c
c            y = a + b * x
c defid deluid   tsopfg    aslt     bslt     aift     bift     agwt   bgwt  islt   iift   igwt
c---------------------------------------------------------------------------------------------
c462 mon-aslt
c    only required if tempfg = 1 and msltfg = 1 (see card 460)
c
c    defid   parameter group id
c    deluid  landuse id
c    jan-dec surface layer temperature when the air temperature 0 degrees C at start of each month (C)
c
c defid deluid   jan   feb   mar   apr   may   jun   jul   aug   sep   oct   nov   dec
c-------------------------------------------------------------------------------------
c463 mon-bslt
c    only required if tempfg = 1 and msltfg = 1 (see card 460)
c
c    defid   parameter group id
c    deluid  landuse id
c    jan-dec slope of the surface layer temperature regression equation at start of each month
c
c defid deluid   jan   feb   mar   apr   may   jun   jul   aug   sep   oct   nov   dec
c-------------------------------------------------------------------------------------
c464 mon-aift
c    only required if tempfg = 1 and miftfg = 1 (see card 460)
c
c    defid   parameter group id
c    deluid  landuse id
c    jan-dec mean difference between interflow temperature and air temperature at start of each month (C)
c
c defid deluid   jan   feb   mar   apr   may   jun   jul   aug   sep   oct   nov   dec
c-------------------------------------------------------------------------------------
c465 mon-bift
c    only required if tempfg = 1 and miftfg = 1 (see card 460)
c
c    defid   parameter group id
c    deluid  landuse id
c    jan-dec smoothing factor in the interflow temperature calculation at start of each month
c
c defid deluid   jan   feb   mar   apr   may   jun   jul   aug   sep   oct   nov   dec
c-------------------------------------------------------------------------------------
c466 mon-agwt
c    only required if tempfg = 1 and mgwtfg = 1 (see card 460)
c
c    defid   parameter group id
c    deluid  landuse id
c    jan-dec mean difference between groundwater temperature and air temperature at start of each month (C)
c
c defid deluid   jan   feb   mar   apr   may   jun   jul   aug   sep   oct   nov   dec
c-------------------------------------------------------------------------------------
c467 mon-bgwt
c    only required if tempfg = 1 and mgwtfg = 1 (see card 460)
c
c    defid   parameter group id
c    deluid  landuse id
c    jan-dec smoothing factor in the groundwater temperature calculation at start of each month
c
c defid deluid   jan   feb   mar   apr   may   jun   jul   aug   sep   oct   nov   dec
```

```
c------------------------------------------------------------------------------------
c470 Temperature Parameters for Land Groups  (read if tempfg =1)
c
c    subbasin    subbasin id
c    melev     the mean watershed elevation (ft)
c    eldat       difference in elevation between watershed and the air temperature gage (ft)
c    rmelev      the mean RCHRES elevation (ft)
c    reldat      difference in elevation between the RCHRES and the air temperature gage (ft)
c                (positive if RCHRES is higher than the gage).
c
c subbasin   melev     eldat   rmelev     reldat
c--------------------------------------------------------------------------------------------
c474 24-hourly dry lapse rates (read if tempfg = 1)
c
c    12AM-11PM  lapse_rate - dry period lapse rate varying between 0.0035 to 0.005 (degree F/ft)
c
c   12AM   1AM   2AM   3AM   4AM   5AM   6AM   7AM   8AM   9AM   10AM   11AM 12PM   1PM   2PM   3PM   4PM   5PM
6PM   7PM   8PM   9PM   10PM   11PM
c--------------------------------------------------------------------------------------------
c475 Temperature Parameters for Stream Groups  (read if tempfg =1)
c
c    rgid    stream parameters group id
c    cfsaex  correction factor for solar radiation; fraction of RCHRES surface exposed to radiation
c    katrad  longwave radiation coefficient
c    kcond   conduction-convection heat transport coefficient
c    kevap   evaporation coefficient
c
c rgid   cfsaex    katrad     kcond     kevap
c--------------------------------------------------------------------------------------------
c480 Bed Heat Conduction Parameters for Stream Groups  (read if tempfg=1)
c
c    rgid    stream parameters group id
c    preflg  flag for heat transfer rates for water surface (0 = off)
c    bedflg  bed conduction flag
c            0 - bed conduction is not simulated
c            1 - single interface (water-mud) heat transfer method
c            2 - two-interface (water-mud and mud-ground) heat transfer method
c            3 - Jobson method (not supported)
c    tgflg   source of the ground temperature for the bed conduction (used when bedflg is 1 or 2)
c            1 - time series (not supported)
c            2 - single value
c            3 - monthly values (card 485)
c    muddep  depth of the mud layer in the two-interface model (bedflg = 2) (m)
c    tgrnd   constant (tgflg = 2) ground temperature (bedflg = 1 or 2) (degree C)
c    kmud    heat conduction coefficient between water and the mud/ground (bedflg = 1 or 2) (kcal/m2/degC/hr)
c    kgrnd   heat conduction coefficient between ground and mud in the two-interface model (bedflg = 2)
(kcal/m2/degC/hr)
c
c rgid   preflg   bedflg   tgflg   muddep   tgrnd   kmud   kgrnd
c--------------------------------------------------------------------------------------------
c485 monthly ground temperatures for bed heat conduction algorithms
c    only required if tgflg = 3 (see card 480)
c
c    rgid     stream parameter group id
c    jan-dec  tgrndm - monthly ground temperatures for use in the bed heat conduction models (degree C)
c
c  rgid jan   feb   mar   apr   may   jun   jul   aug   sep   oct   nov   dec
c--------------------------------------------------------------------------------------------
c500 land to stream mapping (read if oxfg =1)
c
c    deluid  landuse id
c    dwqid   general quality id
c    lutype  landuse type flow id (1 = impervious surfaceflow,
c            2 = pervious surfaceflow, 3 = pervious interflow, 4 = pervious groundflow)
c    bod     bod fraction in pqual
c    nox     nitrate fraction in pqual
c    tam     total ammonia fraction in  pqual
c    snh4    particulate NH4-N fraction in pqual
c    po4     ortho-phosphorus fraction in pqual
c    spo4    particulate PO4-P fraction in pqual
c    orn     organic-nitrogen fraction in pqual
c    orp     organic-phosphorus fraction in pqual
c    orc     organic-carbon fraction in pqual
c
c deluid    dwqid    lutype   bod   nox   tam   snh4   po4   spo4   orn   orp   orc
c--------------------------------------------------------------------------------------------
c501 atmosphere to stream mapping
c
c    only required if adfgrch = 1 (see card 280)
```

```
c
c    rgid    stream parameter group ID
c    dwqid   general quality ID
c    bod     bod fraction in PQUAL
c    nox     nitrate fraction in PQUAL
c    tam     total ammonia fraction in PQUAL
c    po4     orthophosphate fraction in PQUAL
c    orn     organic-nitrogen fraction in PQUAL
c    orp     organic-phosphorus fraction in PQUAL
c    orc     organic-carbon fraction in PQUAL
c
c rgid  dwqid  bod  nox  tam  po4  orn  orp  orc
c--------------------------------------------------------------------------------------------
c502 gases control   (read if oxfg =1)
c
c    midofg  if = 1 monthly very DO concentration in interflow
c    mico2fg if = 1 monthly very CO2 concentration in interflow
c    madofg  if = 1 monthly very DO concentration in ground water
c    maco2fg if = 1 monthly very CO2 concentration in ground water
c
c midofg     mico2fg      madofg      maco2fg
c--------------------------------------------------------------------------------------------
c503   DO-CO2 Control constant values (read if oxfg =1)
c
c    defid   parameter group id
c    deluid  landuse id
c    sdoxp   concentration of dissolved oxygen in surface flow (mg/l)
c    sco2p   concentration of dissolved CO2 in surface flow (mg/l)
c    idoxp   concentration of dissolved oxygen in interflow outflow (mg/l)
c    ico2p   concentration of dissolved CO2 in interflow outflow (mg/l)
c    adoxp   concentration of dissolved oxygen in active groundwater outflow (mg/l)
c    aco2p   concentration of dissolved CO2 in active groundwater outflow (mg/l)
c
c defid deluid   sdoxp    sco2p     idoxp    ico2p     adoxp    aco2p
c--------------------------------------------------------------------------------------------
c504 mon-DO (interflow)  mg C/l
c    only required if oxfg = 1 and midofg = 1 (see card 502)
c
c    defid   parameter group id
c    deluid  landuse id
c    jan-dec interflow dissolved oxygen concentration at start of each month (mg/l)
c
c defid deluid   jan   feb   mar   apr   may   jun   jul   aug   sep   oct   nov   dec
c------------------------------------------------------------------------------------
c505 mon-DO (groundwater)
c    only required if oxfg = 1 and madofg = 1 (see card 502)
c
c    defid   parameter group id
c    deluid  landuse id
c    jan-dec groundwater dissolved oxygen concentration at start of each month (mg/l)
c
c defid deluid   jan   feb   mar   apr   may   jun   jul   aug   sep   oct   nov   dec
c------------------------------------------------------------------------------------
c506 mon-CO2 (interflow)  mg C/l
c    only required if oxfg = 1 and mico2fg = 1 (see card 502)
c
c    defid   parameter group id
c    deluid  landuse id
c    jan-dec interflow carbon dioxide concentration at start of each month (mg/l)
c
c defid deluid   jan   feb   mar   apr   may   jun   jul   aug   sep   oct   nov   dec
c--------------------------------------------------------------------------------------------
c507 mon-CO2 (groundwater)
c    only required if oxfg = 1 and maco2fg = 1 (see card 502)
c
c    defid   parameter group id
c    deluid  landuse id
c    jan-dec groundwater carbon dioxide concentration at start of each month (mg/l)
c
c defid deluid   jan   feb   mar   apr   may   jun   jul   aug   sep   oct   nov   dec
c--------------------------------------------------------------------------------------------
c510 DO/BOD control
c
c    benrfg   benthic release flag (for benthic related parameters)
c    reamfg reaeration flag (indicates the method used to calculate the reaeration coefficient for free-flowing
streams)
c    if = 1 then Tsivoglou method is used
c    if = 2 then Owens, Churchill, or O'Connor-Dobbins method is used depending on velocity and depth of water
c    if = 3 then Coefficient is calculated as a power function of velocity and/or depth
```

```
c
c benrfg     reamfg
c--------------------------------------------------------------------------------------------
c511 ox-parm1
c
c    rgid    stream parameter group id
c    kbod20  bod decay rate at 20oC (1/hr)
c    tcbod   temperature adjustment coefficient for bod decay
c    kodset  bod settling rate (m/hr)
c    supsat  maximum allowable dissolved oxygen supersaturation (expressed as a multiple of the dissolved oxygen
saturation concentration)
c    tcginv  temperature correction coefficient for surface gas invasion
c    reak    empirical constant in the equation
c            if reamfg = 1 then it is an escape coefficient (1/ft)
c            if reamfg = 3 then it is used to calculate the reaeration coefficient (1/hr)
c    expred  exponent to depth in the reaeration coefficient equation (for reamfg = 3)
c    exprev  exponent to velocity in the reaeration coefficient equation (for reamfg = 3)
c    cforea  correction factor in the lake reaeration equation; it accounts for good or poor circulation
characteristics
c
c rgid   kbod20   tcbod   kodset   supsat   tcginv   reak   expred   exprev   cforea
c--------------------------------------------------------------------------------------------
c512 ox-parm2
c
c    rgid       stream parameter group id
c    benod      benthal oxygen demand at 20 degrees C (with unlimited DO concentration) (mg/m2/hr)
c    tcben      temperature correction coefficient for benthal oxygen demand
c    expod      exponential factor in the dissolved oxygen term of the benthal oxygen demand equation
c    brbod      benthal release rate of BOD under aerobic conditions.(mg/m2/hr)
c    brbod_inc  increment to benthal release of BOD under anaerobic conditions. (mg/m2/hr)
c    expre1     the exponent in the DO term of the benthal BOD release equation
c
c rgid   benod   tcben   expod   brbod   brbod_inc   exprel
c------------------------------------------------------------------------------------
c513 oxrx-initial conditions
c
c    rgid   stream parameter group id
c    dox    DO initial condition. (mg/l)
c    bod    BOD initial condition in water column. (mg/l)
c    satdo  Initial DO saturation concentration. (mg/l)
c
c rgid   dox   bod   satdo
c------------------------------------------------------------------------------------
c514 ox-scour parms
c
c    rgid   stream parameter group id
c    scrvel threshold velocity above which the effect of scouring on benthal release rates is considered. (m/s)
c    scrmul multiplier by which benthal releases are increased during scouring.
c
c rgid   scrvel   scrmul
c------------------------------------------------------------------------------------
c520 nutrients control
c
c    tamfg    total ammonia flag
c    no2fg    nitrite flag
c    po4fg    ortho-phosphorus flag
c    amvfg    ammonia volatilization flag
c    denfg    denitrification flag
c    adnhfg   NH4 adsorption flag
c    adpofg   PO4 adsorption flag
c    mphfg    monthly pH flag (not supported in this version)
c
c tamfg   no2fg   po4fg   amvfg   denfg   adnhfg   adpofg   mphfg
c--------------------------------------------------------------------------------------------
c521 nut-parm1
c
c    rgid    stream parameter group id
c    cvbo    conversion from milligrams biomass to milligrams oxygen (mg/mg)
c    cvbpc   conversion from biomass expressed as phosphorus to carbon (mols/mol)
c    cvbpn   conversion from biomass expressed as phosphorus to nitrogen (mols/mol)
c    bpcntc  percentage of biomass which is carbon (by weight)
c    ktam20  nitrification rate of ammonia at 20 degrees C (1/hr)
c    kno220  nitrification rate of nitrite at 20 degrees C (1/hr)
c    tcnit   temperature correction coefficient for nitrification
c    kno320  nitrate denitrification rate at 20 degrees C (1/hr)
c    tcden   temperature correction coefficient for denitrification
c    denoxt  dissolved oxygen concentration threshold for denitrification (mg/l)
c
c rgid   cvbo   cvbpc   cvbpn  bpcntc   ktam20  kno220  tcnit  kno320  tcden  denoxt
```

```
c-------------------------------------------------------------------------------------
c522 nut-parm2
c
c    rgid         stream parameter group id
c    brtam_1      benthal release rate of ammonia under aerobic condition (mg/m2/hr)
c    brtam_2      benthal release rates of ammonia under anaerobic conditions (mg/m2/hr)
c    brpo4_1      benthal release rate of ortho-phosphorus under aerobic condition (mg/m2/hr)
c    brpo4_2      benthal release rate of ortho-phosphorus under anaerobic condition (mg/m2/hr)
c    bnh4(1-3)    constant bed concentrations of ammonia-N adsorbed to sand, silt, and clay (mg/kg)
c    bpo4(1-3)    constant bed concentrations of ortho-phosphorus-P adsorbed to sand, silt, and clay (mg/kg)
c
c rgid   brtam_1   brtam_2   brpo4_1   brpo4_2   bnh4_1   bnh4_2   bnh4_3    bpo4_1   bpo4_2   bpo4_3
c---------------------------------------------------------------------------------
c523 nut-parm3
c
c    rgid         stream parameter group id
c    anaer        concentration of dissolved oxygen below which anaerobic conditions are assumed to exist (mg/l)
c    adnhpm(1-3)  adsorption coefficients (Kd) for ammonia-N adsorbed to sand, silt, and clay (cm3/g)
c    adpopm(1-3)  adsorption coefficients for ortho-phosphorus-P adsorbed to sand, silt, and clay (cm3/g)
c    expnvg       exponent in the gas layer mass transfer coefficient equation for NH3 volatilization
c    expnvl       exponent in the liquid layer mass transfer coefficient equation for NH3 volatilization
c
c rgid  anaer    adnhpm_1   adnhpm_2   adnhpm_3   adpopm_1   adpopm_2   adpopm_3   expnvg   expnvl
c---------------------------------------------------------------------------------
c524 nut-initial conditions
c
c    rgid       stream parameter group id
c    no3        initial concentration of nitrate (mg/l)
c    tam        initial concentration of total ammonia (mg/l)
c    no2        initial concentration of nitrite (as N) (mg/l)
c    po4        initial concentration of ortho-phosphorus (as P) (mg/l)
c    snh4(1-3)  initial suspended concentrations of ammonia-N adsorbed to sand, silt, and clay (mg/kg)
c    spo4(1-3)  initial suspended concentrations of ortho-phosphorus-P adsorbed to sand, silt, and clay (mg/kg)
c
c rgid   no3   tam   no2   po4   snh4_1   snh4_2   snh4_3   spo4_1   spo4_2   spo4_3
c---------------------------------------------------------------------------------
c530 plank flags
c
c    phyfg    phytoplankton flag
c    zoofg    zooplankton flag
c    balfg    benthic algae flag
c    sdltfg   influence of sediment washload on light extinction flag
c    amrfg    ammonia retardation of nitrogen-limited growth flag
c    decfg    linkage between carbon dioxide and phytoplankton growth flag (if on, the linkage is decoupled)
c    nsfg     ammonia is included as part of available nitrogen supply in nitrogen limited growth calculations
c    orefg    indicates the oref parameter in card 534 as a flowrate (if = 0) otherwise velocity
c
c phyfg   zoofg   balfg   sdltfg   amrfg   decfg   nsfg   orefg
c-------------------------------------------------------------------------------------
c531 plank-parm1
c
c    rgid    stream parameter group id
c    ratclp  ratio of chlorophyll A content of biomass to phosphorus content
c    nonref  non-refractory fraction of algae and zooplankton biomass
c    litsed  multiplication factor to total sediment concentration to determine sediment contribution to light
extinction (l/mg/ft)
c    alnpr   fraction of nitrogen requirements for phytoplankton growth that is satisfied by nitrate
c    extb    base extinction coefficient for light (1/m)
c    malgr   maximum unit algal growth rate (1/hr)
c
c rgid    ratclp   nonref   litsed   alnpr   extb    malgr
c-------------------------------------------------------------------------------------
c532 plank-parm2
c
c    rgid    stream parameter group id
c    cmmlt   Michaelis-Menten constant for light limited growth (lay/min)
c    cmmn    nitrate Michaelis-Menten constant for nitrogen limited growth (mg/l)
c    cmmnp   nitrate Michaelis-Menten constant for phosphorus limited growth (mg/l)
c    cmmp    phosphate Michaelis-Menten constant for phosphorus limited growth (mg/l)
c    talgrh  temperature above which algal growth ceases (C)
c    talgrl  temperature below which algal growth ceases (C)
c    talgrm  temperature below which algal growth is retarded (C)
c
c rgid    cmmlt    cmmn    cmmnp    cmmp    talgrh   talgrl   talgrm
c---------------------------------------------------------------------------------
c533 plank-parm3
c
c    rgid   stream parameter group id
c    alr20  algal unit respiration rate at 20 degrees C (1/hr)
```

```
c    aldh   high algal unit death rate (1/hr)
c    aldl   low algal unit death rate (1/hr)
c    oxald  increment to phytoplankton unit death rate due to anaerobic conditions (1/hr)
c    naldh  inorganic nitrogen concentration below which high algal death rate occurs (as nitrogen) (mg/l)
c    paldh  inorganic phosphorus concentration below which high algal death rate occurs (as phosphorus) (mg/l)
c
c rgid     alr20      aldh      aldl     oxald     naldh     paldh
c------------------------------------------------------------------------------------
c534 plank-parm4
c
c    rgid    stream parameter group id
c    phycon  constant inflow concentration of plankton from land to reach (mg/l)
c    seed    minimum concentration of plankton not subject to advection (i.e., at high flow) (mg/l)
c    mxstay  concentration of plankton not subject to advection at very low flow (mg/l)
c    oref    velocity/outflow at which the concentration of plankton not subject to advection is midway between
SEED and MXSTAY, see card 530 (m/s or m3/s)
c    claldh  chlorophyll a concentration above which high algal death rate occurs (ug/l)
c    physet  phytoplankton settling rate (m/hr)
c    refset  settling rate for dead refractory organics (m/hr)
c    cfsaex  This factor is used to adjust the input solar radiation to make it applicable to the RCHRES;
c            for example, to account for shading of the surface by trees or buildings
c    mbal    maximum benthic algae density (as biomass) (mg/m2)
c    cfbalr  ratio of benthic algal to phytoplankton respiration rate
c    cfbalg  ratio of benthic algal to phytoplankton growth rate
c
c rgid   phycon   seed   mxstay   oref   claldh   physet   refset  cfsaex  mbal   cfbalr   cfbalg
c------------------------------------------------------------------------------------
c535 plank-initial conditions
c
c    rgid   stream parameter group id
c    phyto  initial phytoplankton concentration, as biomass (mg/l)
c    benal  initial benthic algae density, as biomass (mg/m2)
c    orn    initial dead refractory organic nitrogen concentration (mg/l)
c    orp    initial dead refractory organic phosphorus concentration (mg/l)
c    orc    initial dead refractory organic carbon concentration (mg/l)
c
c rgid    phyto    benal   orn    orp    orc
c------------------------------------------------------------------------------------
c540 pH controls
c
c    phffg1   value of 0 indicates that the removal factor for total inorganic carbon is constant, given as
phfrc1
c    a value of 1 indicates the monthly removal factors
c    phffg2   value of 0 indicates that the removal factor for dissolved carbon dioxide is constant, given as
phfrc2
c             a value of 1 indicates the monthly removal factors
c    phfrc1   removal fraction for total inorganic carbon
c    phfrc2   removal fraction for dissolved carbon dioxide
c
c phffg1   phffg2   phfrc1   phfrc2
c--------------------------------------------------------------------------------------------
c541 pH-parm
c
c    rgid    stream parameter group id
c    phcnt maximum number of iterations used to solve for the pH
c    alkcon number of the conservative substance which is used to simulate alkalinity
c            Alkalinity must be simulated in order to obtain valid results
c    cfcinv ratio of the carbon dioxide invasion rate to the oxygen reaeration rate
c    brco2_1 benthal release rate of CO2 (as carbon) for aerobic conditions (mg/m2/hr)
c    brco2_2 benthal release rate of CO2 (as carbon) for anaerobic conditions (mg/m2/hr)
c
c rgid    phcnt   alkcon   cfcinv   brco2_1   brco2_2
c--------------------------------------------------------------------------------------------
c542 pH-initial conditions
c
c    rgid stream parameter group id
c    tic  initial total inorganic carbon (mg/l)
c    co2  initial carbon dioxide (as carbon) (mg/l)
c    ph  initial pH
c
c rgid    tic    co2   ph
c------------------------------------------------------------------------------------
c543 mon-tic (monthly removal fraction for total inorganic carbon)
c    only required if phfg = 1 and phffg1 = 1 (see card 502 and card 540)
c
c    rgid    stream parameter group id
c    jan-dec total inorganic carbon removal fraction at the start of each month
c
c  rgid jan   feb   mar   apr   may   jun   jul   aug   sep   oct   nov   dec
```

```
c--------------------------------------------------------------------------------------------
c544 mon-co2 (monthly removal fraction for dissolved carbon dioxide)
c    only required if phfg = 1 and phffg2 = 1 (see card 502 and card 540)
c
c    rgid    stream parameter group id
c    jan-dec dissolved carbon dioxide removal fraction at the start of each month
c
c  rgid jan   feb   mar   apr   may   jun   jul   aug   sep   oct   nov   dec
c--------------------------------------------------------------------------------------------
c600 TMDL control flags
c
c    ncpt        if > 0 then use point sources control card 660
c    ncland      if > 0 then use landuse control card 670
c                if = 1 then apply reduction to only surface output
c                if = 2 then apply reduction to total land output
c    ncrch       if > 0 then use reach control card 685 and 690
c    ntrgp       number of threshold groups in Card 410 and 610
c    ntnum       number of defined thresholds for analysis
c                if > 0 then use threshold control cards 605 and 610
c
c   ncpt  ncland  ncrch  ntrgp  ntnum
        0      2       0      1       1
c--------------------------------------------------------------------------------------------
c605 TMDL threshold mapping (used if ntnum > 0 in card 600)
c
c    tnum       threshold ordinal number
c    tqsd       threshold qual (1 for dissolved only and 2 for total)
c    tcount     number of water quality constituent to aggregate
c    tqid       list of tqid to aggregate - number of tqid in list = tcount (GQUAL/RQUAL IDs)
c
c    tnum   tqsd    tcount   tqid1   tqid2   .......   tqidn
        1      2       1      100
c--------------------------------------------------------------------------------------------
c610 TMDL threshold definitions (used if ntnum > 0 in card 600)
c
c    trgid      threshold reach group ID (corresponds to trgid on Card 410)
c    tnum       threshold number (corresponds to tnum on Card 605)
c    ttype      threshold type (possible values: 0, 1, 2, 3 or -1, -2, -3)
c                0 = no standard to be applied for the trgid
c                1 = instantaneous values > threshold
c                2 = arithmetic mean > threshold
c                3 = geometric mean > threshold
c               -1 = instantaneous values < threshold
c               -2 = arithmetic mean < threshold
c               -3 = geometric mean < threshold
c    tdays      number of days over model output is aggregated and/or is compared
c               if tdays = 0 then threshold becomes percent of time
c    jan-dec    twelve monthly values for threshold (for constant, use same value 12 times)
c               (units are same as in card 250)
c
c    examples: ttype  tdays  description/interpretation
c                  1      1  at least one instantaneous value within a 1-day running period > threshold
c                 -1      1  at least one instantaneous value within a 1-day running period < threshold
c                  1      0  percent of time that instantaneous value > threshold
c                  2      4  4-day running arithmetic mean > threshold
c                  3     30  30-day running geometric mean > threshold (for previous 30-days)
c
c  trgid  tnum   ttype  tdays   jan   feb   mar   apr   may   jun   jul   aug   sep   oct   nov   dec
        1      1       1      0       0.000000       0.000000       0.000000       0.000000       0.000000
       0.000000       0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
c---------------------------------------------------------------------------------------
c660 TMDL point source control (used if ncpt > 0 on card 600)
c
c    rchid         reach id
c    permit        point source index (level1)
c    pipe          point source index qualifier (level2)
c    reduction     reduction of pollutant from point source (in fraction)
c
c   rchid   permit   pipe   reduction_flow...reduction_qual1...reduction_qual2...reduction_qualn
c--------------------------------------------------------------------------------------------
c670 TMDL land-based control (used if ncland > 0 on card 600)
c
c    subbasin   subwatershed id
c    deluid     land use id
c    luname     land use name
c    reduction  reduction of pollutant from corresponding landuse and subwatershed
c
c subbasin  deluid pluname  reduction
```

```
6665   1000   Road_Freeway-All-All-All      0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6665   2000   Road_Primary-All-All-All      0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6665   3000   Road_Minor-All-All-All 0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6665   4000   Dev_ResHigh-All-All-All       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6665   5000   Dev_ResLow-All-All-All 0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6665   6000   Dev_Com-All-All-All    0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6665   7000   Dev_Ind-All-All-All    0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6665   8000   Dev_Inst-All-All-All   0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6665   9000   Dev_Roof-All-All-All   0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6665   10000  Dev_Overspray-All-All-All     0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6665   11111  Dev_Irrigated-A-Low-Confined  0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6665   11112  Dev_Irrigated-A-Low-Unconfined       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6665   11121  Dev_Irrigated-A-Med-Confined  0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6665   11122  Dev_Irrigated-A-Med-Unconfined       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6665   11211  Dev_Irrigated-B-Low-Confined  0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6665   11212  Dev_Irrigated-B-Low-Unconfined       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6665   11221  Dev_Irrigated-B-Med-Confined  0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6665   11222  Dev_Irrigated-B-Med-Unconfined       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6665   11311  Dev_Irrigated-C-Low-Confined  0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6665   11312  Dev_Irrigated-C-Low-Unconfined       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6665   11321  Dev_Irrigated-C-Med-Confined  0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6665   11322  Dev_Irrigated-C-Med-Unconfined       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6665   11411  Dev_Irrigated-D-Low-Confined  0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6665   11412  Dev_Irrigated-D-Low-Unconfined       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6665   11421  Dev_Irrigated-D-Med-Confined  0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6665   11422  Dev_Irrigated-D-Med-Unconfined       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6665   12111  Dev_Pervious-A-Low-Confined   0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6665   12112  Dev_Pervious-A-Low-Unconfined 0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6665   12121  Dev_Pervious-A-Med-Confined   0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6665   12122  Dev_Pervious-A-Med-Unconfined 0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6665   12211  Dev_Pervious-B-Low-Confined   0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6665   12212  Dev_Pervious-B-Low-Unconfined 0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6665   12221  Dev_Pervious-B-Med-Confined   0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6665   12222  Dev_Pervious-B-Med-Unconfined 0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6665   12311  Dev_Pervious-C-Low-Confined   0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6665   12312  Dev_Pervious-C-Low-Unconfined 0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6665   12321  Dev_Pervious-C-Med-Confined   0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6665   12322  Dev_Pervious-C-Med-Unconfined 0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6665   12411  Dev_Pervious-D-Low-Confined   0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
```

```
6665   12412   Dev_Pervious-D-Low-Unconfined 0.000000      0.000000      0.000000      0.000000
0.000000       0.000000      0.000000      0.000000      0.000000      0.000000
6665   12421   Dev_Pervious-D-Med-Confined   0.000000      0.000000      0.000000      0.000000
0.000000       0.000000      0.000000      0.000000      0.000000      0.000000
6665   12422   Dev_Pervious-D-Med-Unconfined 0.000000      0.000000      0.000000      0.000000
0.000000       0.000000      0.000000      0.000000      0.000000      0.000000
6665   13111   Agriculture-A-Low-Confined    0.000000      0.000000      0.000000      0.000000
0.000000       0.000000      0.000000      0.000000      0.000000      0.000000
6665   13112   Agriculture-A-Low-Unconfined  0.000000      0.000000      0.000000      0.000000
0.000000       0.000000      0.000000      0.000000      0.000000      0.000000
6665   13121   Agriculture-A-Med-Confined    0.000000      0.000000      0.000000      0.000000
0.000000       0.000000      0.000000      0.000000      0.000000      0.000000
6665   13122   Agriculture-A-Med-Unconfined  0.000000      0.000000      0.000000      0.000000
0.000000       0.000000      0.000000      0.000000      0.000000      0.000000
6665   13211   Agriculture-B-Low-Confined    0.000000      0.000000      0.000000      0.000000
0.000000       0.000000      0.000000      0.000000      0.000000      0.000000
6665   13212   Agriculture-B-Low-Unconfined  0.000000      0.000000      0.000000      0.000000
0.000000       0.000000      0.000000      0.000000      0.000000      0.000000
6665   13221   Agriculture-B-Med-Confined    0.000000      0.000000      0.000000      0.000000
0.000000       0.000000      0.000000      0.000000      0.000000      0.000000
6665   13222   Agriculture-B-Med-Unconfined  0.000000      0.000000      0.000000      0.000000
0.000000       0.000000      0.000000      0.000000      0.000000      0.000000
6665   13231   Agriculture-B-High-Confined   0.000000      0.000000      0.000000      0.000000
0.000000       0.000000      0.000000      0.000000      0.000000      0.000000
6665   13232   Agriculture-B-High-Unconfined 0.000000      0.000000      0.000000      0.000000
0.000000       0.000000      0.000000      0.000000      0.000000      0.000000
6665   13311   Agriculture-C-Low-Confined    0.000000      0.000000      0.000000      0.000000
0.000000       0.000000      0.000000      0.000000      0.000000      0.000000
6665   13312   Agriculture-C-Low-Unconfined  0.000000      0.000000      0.000000      0.000000
0.000000       0.000000      0.000000      0.000000      0.000000      0.000000
6665   13321   Agriculture-C-Med-Confined    0.000000      0.000000      0.000000      0.000000
0.000000       0.000000      0.000000      0.000000      0.000000      0.000000
6665   13322   Agriculture-C-Med-Unconfined  0.000000      0.000000      0.000000      0.000000
0.000000       0.000000      0.000000      0.000000      0.000000      0.000000
6665   13331   Agriculture-C-High-Confined   0.000000      0.000000      0.000000      0.000000
0.000000       0.000000      0.000000      0.000000      0.000000      0.000000
6665   13411   Agriculture-D-Low-Confined    0.000000      0.000000      0.000000      0.000000
0.000000       0.000000      0.000000      0.000000      0.000000      0.000000
6665   13412   Agriculture-D-Low-Unconfined  0.000000      0.000000      0.000000      0.000000
0.000000       0.000000      0.000000      0.000000      0.000000      0.000000
6665   13421   Agriculture-D-Med-Confined    0.000000      0.000000      0.000000      0.000000
0.000000       0.000000      0.000000      0.000000      0.000000      0.000000
6665   13422   Agriculture-D-Med-Unconfined  0.000000      0.000000      0.000000      0.000000
0.000000       0.000000      0.000000      0.000000      0.000000      0.000000
6665   13431   Agriculture-D-High-Confined   0.000000      0.000000      0.000000      0.000000
0.000000       0.000000      0.000000      0.000000      0.000000      0.000000
6665   13432   Agriculture-D-High-Unconfined 0.000000      0.000000      0.000000      0.000000
0.000000       0.000000      0.000000      0.000000      0.000000      0.000000
6665   14121   Veg_Low-A-Med-Confined 0.000000      0.000000      0.000000      0.000000
0.000000       0.000000      0.000000      0.000000      0.000000      0.000000
6665   14122   Veg_Low-A-Med-Unconfined      0.000000      0.000000      0.000000      0.000000
0.000000       0.000000      0.000000      0.000000      0.000000      0.000000
6665   14131   Veg_Low-A-High-Confined       0.000000      0.000000      0.000000      0.000000
0.000000       0.000000      0.000000      0.000000      0.000000      0.000000
6665   14132   Veg_Low-A-High-Unconfined     0.000000      0.000000      0.000000      0.000000
0.000000       0.000000      0.000000      0.000000      0.000000      0.000000
6665   14221   Veg_Low-B-Med-Confined 0.000000      0.000000      0.000000      0.000000
0.000000       0.000000      0.000000      0.000000      0.000000      0.000000
6665   14222   Veg_Low-B-Med-Unconfined      0.000000      0.000000      0.000000      0.000000
0.000000       0.000000      0.000000      0.000000      0.000000      0.000000
6665   14231   Veg_Low-B-High-Confined       0.000000      0.000000      0.000000      0.000000
0.000000       0.000000      0.000000      0.000000      0.000000      0.000000
6665   14232   Veg_Low-B-High-Unconfined     0.000000      0.000000      0.000000      0.000000
0.000000       0.000000      0.000000      0.000000      0.000000      0.000000
6665   14321   Veg_Low-C-Med-Confined 0.000000      0.000000      0.000000      0.000000
0.000000       0.000000      0.000000      0.000000      0.000000      0.000000
6665   14322   Veg_Low-C-Med-Unconfined      0.000000      0.000000      0.000000      0.000000
0.000000       0.000000      0.000000      0.000000      0.000000      0.000000
6665   14331   Veg_Low-C-High-Confined       0.000000      0.000000      0.000000      0.000000
0.000000       0.000000      0.000000      0.000000      0.000000      0.000000
6665   14332   Veg_Low-C-High-Unconfined     0.000000      0.000000      0.000000      0.000000
0.000000       0.000000      0.000000      0.000000      0.000000      0.000000
6665   14421   Veg_Low-D-Med-Confined 0.000000      0.000000      0.000000      0.000000
0.000000       0.000000      0.000000      0.000000      0.000000      0.000000
6665   14422   Veg_Low-D-Med-Unconfined      0.000000      0.000000      0.000000      0.000000
0.000000       0.000000      0.000000      0.000000      0.000000      0.000000
6665   14431   Veg_Low-D-High-Confined       0.000000      0.000000      0.000000      0.000000
0.000000       0.000000      0.000000      0.000000      0.000000      0.000000
```

```
6665    14432  Veg_Low-D-High-Unconfined     0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6665    15121  Veg_High-A-Med-Confined       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6665    15122  Veg_High-A-Med-Unconfined     0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6665    15131  Veg_High-A-High-Confined      0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6665    15132  Veg_High-A-High-Unconfined    0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6665    15221  Veg_High-B-Med-Confined       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6665    15222  Veg_High-B-Med-Unconfined     0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6665    15231  Veg_High-B-High-Confined      0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6665    15232  Veg_High-B-High-Unconfined    0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6665    15321  Veg_High-C-Med-Confined       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6665    15322  Veg_High-C-Med-Unconfined     0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6665    15331  Veg_High-C-High-Confined      0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6665    15332  Veg_High-C-High-Unconfined    0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6665    15421  Veg_High-D-Med-Confined       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6665    15422  Veg_High-D-Med-Unconfined     0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6665    15431  Veg_High-D-High-Confined      0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6665    15432  Veg_High-D-High-Unconfined    0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6665    16000  Water-All-All-All     0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6671    1000   Road_Freeway-All-All-All      0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6671    2000   Road_Primary-All-All-All      0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6671    3000   Road_Minor-All-All-All0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6671    4000   Dev_ResHigh-All-All-All       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6671    5000   Dev_ResLow-All-All-All0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6671    6000   Dev_Com-All-All-All   0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6671    7000   Dev_Ind-All-All-All   0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6671    8000   Dev_Inst-All-All-All  0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6671    9000   Dev_Roof-All-All-All  0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6671    10000  Dev_Overspray-All-All-All     0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6671    11111  Dev_Irrigated-A-Low-Confined  0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6671    11112  Dev_Irrigated-A-Low-Unconfined       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6671    11121  Dev_Irrigated-A-Med-Confined  0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6671    11122  Dev_Irrigated-A-Med-Unconfined       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6671    11211  Dev_Irrigated-B-Low-Confined  0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6671    11212  Dev_Irrigated-B-Low-Unconfined       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6671    11221  Dev_Irrigated-B-Med-Confined  0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6671    11222  Dev_Irrigated-B-Med-Unconfined       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6671    11311  Dev_Irrigated-C-Low-Confined  0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6671    11312  Dev_Irrigated-C-Low-Unconfined       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6671    11321  Dev_Irrigated-C-Med-Confined  0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
```

```
6671    11322   Dev_Irrigated-C-Med-Unconfined       0.000000       0.000000       0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6671    11411   Dev_Irrigated-D-Low-Confined  0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6671    11412   Dev_Irrigated-D-Low-Unconfined       0.000000       0.000000       0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6671    11421   Dev_Irrigated-D-Med-Confined  0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6671    11422   Dev_Irrigated-D-Med-Unconfined       0.000000       0.000000       0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6671    12111   Dev_Pervious-A-Low-Confined   0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6671    12112   Dev_Pervious-A-Low-Unconfined 0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6671    12121   Dev_Pervious-A-Med-Confined   0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6671    12122   Dev_Pervious-A-Med-Unconfined 0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6671    12211   Dev_Pervious-B-Low-Confined   0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6671    12212   Dev_Pervious-B-Low-Unconfined 0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6671    12221   Dev_Pervious-B-Med-Confined   0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6671    12222   Dev_Pervious-B-Med-Unconfined 0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6671    12311   Dev_Pervious-C-Low-Confined   0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6671    12312   Dev_Pervious-C-Low-Unconfined 0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6671    12321   Dev_Pervious-C-Med-Confined   0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6671    12322   Dev_Pervious-C-Med-Unconfined 0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6671    12411   Dev_Pervious-D-Low-Confined   0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6671    12412   Dev_Pervious-D-Low-Unconfined 0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6671    12421   Dev_Pervious-D-Med-Confined   0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6671    12422   Dev_Pervious-D-Med-Unconfined 0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6671    13111   Agriculture-A-Low-Confined    0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6671    13112   Agriculture-A-Low-Unconfined  0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6671    13121   Agriculture-A-Med-Confined    0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6671    13122   Agriculture-A-Med-Unconfined  0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6671    13211   Agriculture-B-Low-Confined    0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6671    13212   Agriculture-B-Low-Unconfined  0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6671    13221   Agriculture-B-Med-Confined    0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6671    13222   Agriculture-B-Med-Unconfined  0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6671    13231   Agriculture-B-High-Confined   0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6671    13232   Agriculture-B-High-Unconfined 0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6671    13311   Agriculture-C-Low-Confined    0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6671    13312   Agriculture-C-Low-Unconfined  0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6671    13321   Agriculture-C-Med-Confined    0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6671    13322   Agriculture-C-Med-Unconfined  0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6671    13331   Agriculture-C-High-Confined   0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6671    13411   Agriculture-D-Low-Confined    0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6671    13412   Agriculture-D-Low-Unconfined  0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6671    13421   Agriculture-D-Med-Confined    0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
```

```
6671    13422   Agriculture-D-Med-Unconfined  0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6671    13431   Agriculture-D-High-Confined   0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6671    13432   Agriculture-D-High-Unconfined 0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6671    14121   Veg_Low-A-Med-Confined 0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6671    14122   Veg_Low-A-Med-Unconfined      0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6671    14131   Veg_Low-A-High-Confined       0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6671    14132   Veg_Low-A-High-Unconfined     0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6671    14221   Veg_Low-B-Med-Confined 0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6671    14222   Veg_Low-B-Med-Unconfined      0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6671    14231   Veg_Low-B-High-Confined       0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6671    14232   Veg_Low-B-High-Unconfined     0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6671    14321   Veg_Low-C-Med-Confined 0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6671    14322   Veg_Low-C-Med-Unconfined      0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6671    14331   Veg_Low-C-High-Confined       0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6671    14332   Veg_Low-C-High-Unconfined     0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6671    14421   Veg_Low-D-Med-Confined 0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6671    14422   Veg_Low-D-Med-Unconfined      0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6671    14431   Veg_Low-D-High-Confined       0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6671    14432   Veg_Low-D-High-Unconfined     0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6671    15121   Veg_High-A-Med-Confined       0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6671    15122   Veg_High-A-Med-Unconfined     0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6671    15131   Veg_High-A-High-Confined      0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6671    15132   Veg_High-A-High-Unconfined    0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6671    15221   Veg_High-B-Med-Confined       0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6671    15222   Veg_High-B-Med-Unconfined     0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6671    15231   Veg_High-B-High-Confined      0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6671    15232   Veg_High-B-High-Unconfined    0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6671    15321   Veg_High-C-Med-Confined       0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6671    15322   Veg_High-C-Med-Unconfined     0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6671    15331   Veg_High-C-High-Confined      0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6671    15332   Veg_High-C-High-Unconfined    0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6671    15421   Veg_High-D-Med-Confined       0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6671    15422   Veg_High-D-Med-Unconfined     0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6671    15431   Veg_High-D-High-Confined      0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6671    15432   Veg_High-D-High-Unconfined    0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6671    16000   Water-All-All-All      0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6673    1000    Road_Freeway-All-All-All      0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6673    2000    Road_Primary-All-All-All      0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6673    3000    Road_Minor-All-All-All 0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
```

```
6673    4000   Dev_ResHigh-All-All-All       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6673    5000   Dev_ResLow-All-All-All 0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6673    6000   Dev_Com-All-All-All    0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6673    7000   Dev_Ind-All-All-All    0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6673    8000   Dev_Inst-All-All-All   0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6673    9000   Dev_Roof-All-All-All   0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6673    10000  Dev_Overspray-All-All-All     0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6673    11111  Dev_Irrigated-A-Low-Confined  0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6673    11112  Dev_Irrigated-A-Low-Unconfined        0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6673    11121  Dev_Irrigated-A-Med-Confined  0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6673    11122  Dev_Irrigated-A-Med-Unconfined        0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6673    11211  Dev_Irrigated-B-Low-Confined  0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6673    11212  Dev_Irrigated-B-Low-Unconfined        0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6673    11221  Dev_Irrigated-B-Med-Confined  0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6673    11222  Dev_Irrigated-B-Med-Unconfined        0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6673    11311  Dev_Irrigated-C-Low-Confined  0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6673    11312  Dev_Irrigated-C-Low-Unconfined        0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6673    11321  Dev_Irrigated-C-Med-Confined  0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6673    11322  Dev_Irrigated-C-Med-Unconfined        0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6673    11411  Dev_Irrigated-D-Low-Confined  0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6673    11412  Dev_Irrigated-D-Low-Unconfined        0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6673    11421  Dev_Irrigated-D-Med-Confined  0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6673    11422  Dev_Irrigated-D-Med-Unconfined        0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6673    12111  Dev_Pervious-A-Low-Confined   0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6673    12112  Dev_Pervious-A-Low-Unconfined 0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6673    12121  Dev_Pervious-A-Med-Confined   0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6673    12122  Dev_Pervious-A-Med-Unconfined 0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6673    12211  Dev_Pervious-B-Low-Confined   0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6673    12212  Dev_Pervious-B-Low-Unconfined 0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6673    12221  Dev_Pervious-B-Med-Confined   0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6673    12222  Dev_Pervious-B-Med-Unconfined 0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6673    12311  Dev_Pervious-C-Low-Confined   0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6673    12312  Dev_Pervious-C-Low-Unconfined 0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6673    12321  Dev_Pervious-C-Med-Confined   0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6673    12322  Dev_Pervious-C-Med-Unconfined 0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6673    12411  Dev_Pervious-D-Low-Confined   0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6673    12412  Dev_Pervious-D-Low-Unconfined 0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6673    12421  Dev_Pervious-D-Med-Confined   0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6673    12422  Dev_Pervious-D-Med-Unconfined 0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
```

```
6673    13111   Agriculture-A-Low-Confined    0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6673    13112   Agriculture-A-Low-Unconfined  0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6673    13121   Agriculture-A-Med-Confined    0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6673    13122   Agriculture-A-Med-Unconfined  0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6673    13211   Agriculture-B-Low-Confined    0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6673    13212   Agriculture-B-Low-Unconfined  0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6673    13221   Agriculture-B-Med-Confined    0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6673    13222   Agriculture-B-Med-Unconfined  0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6673    13231   Agriculture-B-High-Confined   0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6673    13232   Agriculture-B-High-Unconfined 0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6673    13311   Agriculture-C-Low-Confined    0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6673    13312   Agriculture-C-Low-Unconfined  0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6673    13321   Agriculture-C-Med-Confined    0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6673    13322   Agriculture-C-Med-Unconfined  0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6673    13331   Agriculture-C-High-Confined   0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6673    13411   Agriculture-D-Low-Confined    0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6673    13412   Agriculture-D-Low-Unconfined  0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6673    13421   Agriculture-D-Med-Confined    0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6673    13422   Agriculture-D-Med-Unconfined  0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6673    13431   Agriculture-D-High-Confined   0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6673    13432   Agriculture-D-High-Unconfined 0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6673    14121   Veg_Low-A-Med-Confined 0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6673    14122   Veg_Low-A-Med-Unconfined      0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6673    14131   Veg_Low-A-High-Confined       0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6673    14132   Veg_Low-A-High-Unconfined     0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6673    14221   Veg_Low-B-Med-Confined 0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6673    14222   Veg_Low-B-Med-Unconfined      0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6673    14231   Veg_Low-B-High-Confined       0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6673    14232   Veg_Low-B-High-Unconfined     0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6673    14321   Veg_Low-C-Med-Confined 0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6673    14322   Veg_Low-C-Med-Unconfined      0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6673    14331   Veg_Low-C-High-Confined       0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6673    14332   Veg_Low-C-High-Unconfined     0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6673    14421   Veg_Low-D-Med-Confined 0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6673    14422   Veg_Low-D-Med-Unconfined      0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6673    14431   Veg_Low-D-High-Confined       0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6673    14432   Veg_Low-D-High-Unconfined     0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6673    15121   Veg_High-A-Med-Confined       0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6673    15122   Veg_High-A-Med-Unconfined     0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
```

```
6673   15131   Veg_High-A-High-Confined      0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6673   15132   Veg_High-A-High-Unconfined    0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6673   15221   Veg_High-B-Med-Confined       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6673   15222   Veg_High-B-Med-Unconfined     0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6673   15231   Veg_High-B-High-Confined      0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6673   15232   Veg_High-B-High-Unconfined    0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6673   15321   Veg_High-C-Med-Confined       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6673   15322   Veg_High-C-Med-Unconfined     0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6673   15331   Veg_High-C-High-Confined      0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6673   15332   Veg_High-C-High-Unconfined    0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6673   15421   Veg_High-D-Med-Confined       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6673   15422   Veg_High-D-Med-Unconfined     0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6673   15431   Veg_High-D-High-Confined      0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6673   15432   Veg_High-D-High-Unconfined    0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6673   16000   Water-All-All-All     0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6674   1000    Road_Freeway-All-All-All      0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6674   2000    Road_Primary-All-All-All      0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6674   3000    Road_Minor-All-All-All0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6674   4000    Dev_ResHigh-All-All-All       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6674   5000    Dev_ResLow-All-All-All0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6674   6000    Dev_Com-All-All-All   0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6674   7000    Dev_Ind-All-All-All   0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6674   8000    Dev_Inst-All-All-All  0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6674   9000    Dev_Roof-All-All-All  0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6674   10000   Dev_Overspray-All-All-All     0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6674   11111   Dev_Irrigated-A-Low-Confined  0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6674   11112   Dev_Irrigated-A-Low-Unconfined       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6674   11121   Dev_Irrigated-A-Med-Confined  0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6674   11122   Dev_Irrigated-A-Med-Unconfined       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6674   11211   Dev_Irrigated-B-Low-Confined  0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6674   11212   Dev_Irrigated-B-Low-Unconfined       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6674   11221   Dev_Irrigated-B-Med-Confined  0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6674   11222   Dev_Irrigated-B-Med-Unconfined       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6674   11311   Dev_Irrigated-C-Low-Confined  0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6674   11312   Dev_Irrigated-C-Low-Unconfined       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6674   11321   Dev_Irrigated-C-Med-Confined  0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6674   11322   Dev_Irrigated-C-Med-Unconfined       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6674   11411   Dev_Irrigated-D-Low-Confined  0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6674   11412   Dev_Irrigated-D-Low-Unconfined       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
```

```
6674    11421  Dev_Irrigated-D-Med-Confined  0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6674    11422  Dev_Irrigated-D-Med-Unconfined       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6674    12111  Dev_Pervious-A-Low-Confined   0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6674    12112  Dev_Pervious-A-Low-Unconfined 0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6674    12121  Dev_Pervious-A-Med-Confined   0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6674    12122  Dev_Pervious-A-Med-Unconfined 0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6674    12211  Dev_Pervious-B-Low-Confined   0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6674    12212  Dev_Pervious-B-Low-Unconfined 0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6674    12221  Dev_Pervious-B-Med-Confined   0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6674    12222  Dev_Pervious-B-Med-Unconfined 0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6674    12311  Dev_Pervious-C-Low-Confined   0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6674    12312  Dev_Pervious-C-Low-Unconfined 0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6674    12321  Dev_Pervious-C-Med-Confined   0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6674    12322  Dev_Pervious-C-Med-Unconfined 0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6674    12411  Dev_Pervious-D-Low-Confined   0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6674    12412  Dev_Pervious-D-Low-Unconfined 0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6674    12421  Dev_Pervious-D-Med-Confined   0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6674    12422  Dev_Pervious-D-Med-Unconfined 0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6674    13111  Agriculture-A-Low-Confined    0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6674    13112  Agriculture-A-Low-Unconfined  0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6674    13121  Agriculture-A-Med-Confined    0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6674    13122  Agriculture-A-Med-Unconfined  0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6674    13211  Agriculture-B-Low-Confined    0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6674    13212  Agriculture-B-Low-Unconfined  0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6674    13221  Agriculture-B-Med-Confined    0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6674    13222  Agriculture-B-Med-Unconfined  0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6674    13231  Agriculture-B-High-Confined   0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6674    13232  Agriculture-B-High-Unconfined 0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6674    13311  Agriculture-C-Low-Confined    0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6674    13312  Agriculture-C-Low-Unconfined  0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6674    13321  Agriculture-C-Med-Confined    0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6674    13322  Agriculture-C-Med-Unconfined  0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6674    13331  Agriculture-C-High-Confined   0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6674    13411  Agriculture-D-Low-Confined    0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6674    13412  Agriculture-D-Low-Unconfined  0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6674    13421  Agriculture-D-Med-Confined    0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6674    13422  Agriculture-D-Med-Unconfined  0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6674    13431  Agriculture-D-High-Confined   0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6674    13432  Agriculture-D-High-Unconfined 0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
```

```
6674    14121   Veg_Low-A-Med-Confined 0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6674    14122   Veg_Low-A-Med-Unconfined      0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6674    14131   Veg_Low-A-High-Confined       0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6674    14132   Veg_Low-A-High-Unconfined     0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6674    14221   Veg_Low-B-Med-Confined 0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6674    14222   Veg_Low-B-Med-Unconfined      0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6674    14231   Veg_Low-B-High-Confined       0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6674    14232   Veg_Low-B-High-Unconfined     0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6674    14321   Veg_Low-C-Med-Confined 0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6674    14322   Veg_Low-C-Med-Unconfined      0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6674    14331   Veg_Low-C-High-Confined       0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6674    14332   Veg_Low-C-High-Unconfined     0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6674    14421   Veg_Low-D-Med-Confined 0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6674    14422   Veg_Low-D-Med-Unconfined      0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6674    14431   Veg_Low-D-High-Confined       0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6674    14432   Veg_Low-D-High-Unconfined     0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6674    15121   Veg_High-A-Med-Confined       0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6674    15122   Veg_High-A-Med-Unconfined     0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6674    15131   Veg_High-A-High-Confined      0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6674    15132   Veg_High-A-High-Unconfined    0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6674    15221   Veg_High-B-Med-Confined       0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6674    15222   Veg_High-B-Med-Unconfined     0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6674    15231   Veg_High-B-High-Confined      0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6674    15232   Veg_High-B-High-Unconfined    0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6674    15321   Veg_High-C-Med-Confined       0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6674    15322   Veg_High-C-Med-Unconfined     0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6674    15331   Veg_High-C-High-Confined      0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6674    15332   Veg_High-C-High-Unconfined    0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6674    15421   Veg_High-D-Med-Confined       0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6674    15422   Veg_High-D-Med-Unconfined     0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6674    15431   Veg_High-D-High-Confined      0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6674    15432   Veg_High-D-High-Unconfined    0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6674    16000   Water-All-All-All      0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6675    1000    Road_Freeway-All-All-All      0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6675    2000    Road_Primary-All-All-All      0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6675    3000    Road_Minor-All-All-All 0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6675    4000    Dev_ResHigh-All-All-All       0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6675    5000    Dev_ResLow-All-All-All 0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6675    6000    Dev_Com-All-All-All    0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
```

```
6675    7000    Dev_Ind-All-All-All     0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6675    8000    Dev_Inst-All-All-All    0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6675    9000    Dev_Roof-All-All-All    0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6675    10000   Dev_Overspray-All-All-All       0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6675    11111   Dev_Irrigated-A-Low-Confined    0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6675    11112   Dev_Irrigated-A-Low-Unconfined          0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6675    11121   Dev_Irrigated-A-Med-Confined    0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6675    11122   Dev_Irrigated-A-Med-Unconfined          0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6675    11211   Dev_Irrigated-B-Low-Confined    0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6675    11212   Dev_Irrigated-B-Low-Unconfined          0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6675    11221   Dev_Irrigated-B-Med-Confined    0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6675    11222   Dev_Irrigated-B-Med-Unconfined          0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6675    11311   Dev_Irrigated-C-Low-Confined    0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6675    11312   Dev_Irrigated-C-Low-Unconfined          0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6675    11321   Dev_Irrigated-C-Med-Confined    0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6675    11322   Dev_Irrigated-C-Med-Unconfined          0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6675    11411   Dev_Irrigated-D-Low-Confined    0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6675    11412   Dev_Irrigated-D-Low-Unconfined          0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6675    11421   Dev_Irrigated-D-Med-Confined    0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6675    11422   Dev_Irrigated-D-Med-Unconfined          0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6675    12111   Dev_Pervious-A-Low-Confined     0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6675    12112   Dev_Pervious-A-Low-Unconfined   0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6675    12121   Dev_Pervious-A-Med-Confined     0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6675    12122   Dev_Pervious-A-Med-Unconfined   0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6675    12211   Dev_Pervious-B-Low-Confined     0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6675    12212   Dev_Pervious-B-Low-Unconfined   0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6675    12221   Dev_Pervious-B-Med-Confined     0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6675    12222   Dev_Pervious-B-Med-Unconfined   0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6675    12311   Dev_Pervious-C-Low-Confined     0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6675    12312   Dev_Pervious-C-Low-Unconfined   0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6675    12321   Dev_Pervious-C-Med-Confined     0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6675    12322   Dev_Pervious-C-Med-Unconfined   0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6675    12411   Dev_Pervious-D-Low-Confined     0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6675    12412   Dev_Pervious-D-Low-Unconfined   0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6675    12421   Dev_Pervious-D-Med-Confined     0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6675    12422   Dev_Pervious-D-Med-Unconfined   0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6675    13111   Agriculture-A-Low-Confined      0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6675    13112   Agriculture-A-Low-Unconfined    0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6675    13121   Agriculture-A-Med-Confined      0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
```

```
6675    13122   Agriculture-A-Med-Unconfined  0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6675    13211   Agriculture-B-Low-Confined    0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6675    13212   Agriculture-B-Low-Unconfined  0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6675    13221   Agriculture-B-Med-Confined    0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6675    13222   Agriculture-B-Med-Unconfined  0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6675    13231   Agriculture-B-High-Confined   0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6675    13232   Agriculture-B-High-Unconfined 0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6675    13311   Agriculture-C-Low-Confined    0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6675    13312   Agriculture-C-Low-Unconfined  0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6675    13321   Agriculture-C-Med-Confined    0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6675    13322   Agriculture-C-Med-Unconfined  0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6675    13331   Agriculture-C-High-Confined   0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6675    13411   Agriculture-D-Low-Confined    0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6675    13412   Agriculture-D-Low-Unconfined  0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6675    13421   Agriculture-D-Med-Confined    0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6675    13422   Agriculture-D-Med-Unconfined  0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6675    13431   Agriculture-D-High-Confined   0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6675    13432   Agriculture-D-High-Unconfined 0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6675    14121   Veg_Low-A-Med-Confined 0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6675    14122   Veg_Low-A-Med-Unconfined      0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6675    14131   Veg_Low-A-High-Confined       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6675    14132   Veg_Low-A-High-Unconfined     0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6675    14221   Veg_Low-B-Med-Confined 0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6675    14222   Veg_Low-B-Med-Unconfined      0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6675    14231   Veg_Low-B-High-Confined       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6675    14232   Veg_Low-B-High-Unconfined     0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6675    14321   Veg_Low-C-Med-Confined 0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6675    14322   Veg_Low-C-Med-Unconfined      0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6675    14331   Veg_Low-C-High-Confined       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6675    14332   Veg_Low-C-High-Unconfined     0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6675    14421   Veg_Low-D-Med-Confined 0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6675    14422   Veg_Low-D-Med-Unconfined      0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6675    14431   Veg_Low-D-High-Confined       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6675    14432   Veg_Low-D-High-Unconfined     0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6675    15121   Veg_High-A-Med-Confined       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6675    15122   Veg_High-A-Med-Unconfined     0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6675    15131   Veg_High-A-High-Confined      0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6675    15132   Veg_High-A-High-Unconfined    0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6675    15221   Veg_High-B-Med-Confined       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
```

```
6675    15222  Veg_High-B-Med-Unconfined     0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6675    15231  Veg_High-B-High-Confined      0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6675    15232  Veg_High-B-High-Unconfined    0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6675    15321  Veg_High-C-Med-Confined       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6675    15322  Veg_High-C-Med-Unconfined     0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6675    15331  Veg_High-C-High-Confined      0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6675    15332  Veg_High-C-High-Unconfined    0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6675    15421  Veg_High-D-Med-Confined       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6675    15422  Veg_High-D-Med-Unconfined     0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6675    15431  Veg_High-D-High-Confined      0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6675    15432  Veg_High-D-High-Unconfined    0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6675    16000  Water-All-All-All     0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6684    1000   Road_Freeway-All-All-All      0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6684    2000   Road_Primary-All-All-All      0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6684    3000   Road_Minor-All-All-All 0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6684    4000   Dev_ResHigh-All-All-All       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6684    5000   Dev_ResLow-All-All-All 0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6684    6000   Dev_Com-All-All-All   0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6684    7000   Dev_Ind-All-All-All   0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6684    8000   Dev_Inst-All-All-All  0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6684    9000   Dev_Roof-All-All-All  0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6684    10000  Dev_Overspray-All-All-All     0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6684    11111  Dev_Irrigated-A-Low-Confined  0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6684    11112  Dev_Irrigated-A-Low-Unconfined       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6684    11121  Dev_Irrigated-A-Med-Confined  0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6684    11122  Dev_Irrigated-A-Med-Unconfined       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6684    11211  Dev_Irrigated-B-Low-Confined  0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6684    11212  Dev_Irrigated-B-Low-Unconfined       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6684    11221  Dev_Irrigated-B-Med-Confined  0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6684    11222  Dev_Irrigated-B-Med-Unconfined       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6684    11311  Dev_Irrigated-C-Low-Confined  0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6684    11312  Dev_Irrigated-C-Low-Unconfined       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6684    11321  Dev_Irrigated-C-Med-Confined  0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6684    11322  Dev_Irrigated-C-Med-Unconfined       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6684    11411  Dev_Irrigated-D-Low-Confined  0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6684    11412  Dev_Irrigated-D-Low-Unconfined       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6684    11421  Dev_Irrigated-D-Med-Confined  0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6684    11422  Dev_Irrigated-D-Med-Unconfined       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6684    12111  Dev_Pervious-A-Low-Confined   0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
```

```
6684   12112   Dev_Pervious-A-Low-Unconfined 0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6684   12121   Dev_Pervious-A-Med-Confined   0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6684   12122   Dev_Pervious-A-Med-Unconfined 0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6684   12211   Dev_Pervious-B-Low-Confined   0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6684   12212   Dev_Pervious-B-Low-Unconfined 0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6684   12221   Dev_Pervious-B-Med-Confined   0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6684   12222   Dev_Pervious-B-Med-Unconfined 0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6684   12311   Dev_Pervious-C-Low-Confined   0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6684   12312   Dev_Pervious-C-Low-Unconfined 0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6684   12321   Dev_Pervious-C-Med-Confined   0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6684   12322   Dev_Pervious-C-Med-Unconfined 0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6684   12411   Dev_Pervious-D-Low-Confined   0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6684   12412   Dev_Pervious-D-Low-Unconfined 0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6684   12421   Dev_Pervious-D-Med-Confined   0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6684   12422   Dev_Pervious-D-Med-Unconfined 0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6684   13111   Agriculture-A-Low-Confined    0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6684   13112   Agriculture-A-Low-Unconfined  0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6684   13121   Agriculture-A-Med-Confined    0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6684   13122   Agriculture-A-Med-Unconfined  0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6684   13211   Agriculture-B-Low-Confined    0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6684   13212   Agriculture-B-Low-Unconfined  0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6684   13221   Agriculture-B-Med-Confined    0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6684   13222   Agriculture-B-Med-Unconfined  0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6684   13231   Agriculture-B-High-Confined   0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6684   13232   Agriculture-B-High-Unconfined 0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6684   13311   Agriculture-C-Low-Confined    0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6684   13312   Agriculture-C-Low-Unconfined  0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6684   13321   Agriculture-C-Med-Confined    0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6684   13322   Agriculture-C-Med-Unconfined  0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6684   13331   Agriculture-C-High-Confined   0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6684   13411   Agriculture-D-Low-Confined    0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6684   13412   Agriculture-D-Low-Unconfined  0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6684   13421   Agriculture-D-Med-Confined    0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6684   13422   Agriculture-D-Med-Unconfined  0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6684   13431   Agriculture-D-High-Confined   0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6684   13432   Agriculture-D-High-Unconfined 0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6684   14121   Veg_Low-A-Med-Confined 0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6684   14122   Veg_Low-A-Med-Unconfined      0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6684   14131   Veg_Low-A-High-Confined       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
```

```
6684    14132   Veg_Low-A-High-Unconfined      0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6684    14221   Veg_Low-B-Med-Confined 0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6684    14222   Veg_Low-B-Med-Unconfined       0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6684    14231   Veg_Low-B-High-Confined        0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6684    14232   Veg_Low-B-High-Unconfined      0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6684    14321   Veg_Low-C-Med-Confined 0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6684    14322   Veg_Low-C-Med-Unconfined       0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6684    14331   Veg_Low-C-High-Confined        0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6684    14332   Veg_Low-C-High-Unconfined      0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6684    14421   Veg_Low-D-Med-Confined 0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6684    14422   Veg_Low-D-Med-Unconfined       0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6684    14431   Veg_Low-D-High-Confined        0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6684    14432   Veg_Low-D-High-Unconfined      0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6684    15121   Veg_High-A-Med-Confined        0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6684    15122   Veg_High-A-Med-Unconfined      0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6684    15131   Veg_High-A-High-Confined       0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6684    15132   Veg_High-A-High-Unconfined     0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6684    15221   Veg_High-B-Med-Confined        0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6684    15222   Veg_High-B-Med-Unconfined      0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6684    15231   Veg_High-B-High-Confined       0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6684    15232   Veg_High-B-High-Unconfined     0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6684    15321   Veg_High-C-Med-Confined        0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6684    15322   Veg_High-C-Med-Unconfined      0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6684    15331   Veg_High-C-High-Confined       0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6684    15332   Veg_High-C-High-Unconfined     0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6684    15421   Veg_High-D-Med-Confined        0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6684    15422   Veg_High-D-Med-Unconfined      0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6684    15431   Veg_High-D-High-Confined       0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6684    15432   Veg_High-D-High-Unconfined     0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6684    16000   Water-All-All-All      0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6839    1000    Road_Freeway-All-All-All       0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6839    2000    Road_Primary-All-All-All       0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6839    3000    Road_Minor-All-All-All 0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6839    4000    Dev_ResHigh-All-All-All        0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6839    5000    Dev_ResLow-All-All-All 0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6839    6000    Dev_Com-All-All-All    0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6839    7000    Dev_Ind-All-All-All    0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6839    8000    Dev_Inst-All-All-All   0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
6839    9000    Dev_Roof-All-All-All   0.000000        0.000000        0.000000        0.000000
0.000000        0.000000        0.000000        0.000000        0.000000        0.000000
```

```
6839    10000   Dev_Overspray-All-All-All     0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6839    11111   Dev_Irrigated-A-Low-Confined  0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6839    11112   Dev_Irrigated-A-Low-Unconfined       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6839    11121   Dev_Irrigated-A-Med-Confined  0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6839    11122   Dev_Irrigated-A-Med-Unconfined       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6839    11211   Dev_Irrigated-B-Low-Confined  0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6839    11212   Dev_Irrigated-B-Low-Unconfined       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6839    11221   Dev_Irrigated-B-Med-Confined  0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6839    11222   Dev_Irrigated-B-Med-Unconfined       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6839    11311   Dev_Irrigated-C-Low-Confined  0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6839    11312   Dev_Irrigated-C-Low-Unconfined       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6839    11321   Dev_Irrigated-C-Med-Confined  0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6839    11322   Dev_Irrigated-C-Med-Unconfined       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6839    11411   Dev_Irrigated-D-Low-Confined  0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6839    11412   Dev_Irrigated-D-Low-Unconfined       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6839    11421   Dev_Irrigated-D-Med-Confined  0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6839    11422   Dev_Irrigated-D-Med-Unconfined       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6839    12111   Dev_Pervious-A-Low-Confined   0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6839    12112   Dev_Pervious-A-Low-Unconfined 0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6839    12121   Dev_Pervious-A-Med-Confined   0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6839    12122   Dev_Pervious-A-Med-Unconfined 0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6839    12211   Dev_Pervious-B-Low-Confined   0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6839    12212   Dev_Pervious-B-Low-Unconfined 0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6839    12221   Dev_Pervious-B-Med-Confined   0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6839    12222   Dev_Pervious-B-Med-Unconfined 0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6839    12311   Dev_Pervious-C-Low-Confined   0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6839    12312   Dev_Pervious-C-Low-Unconfined 0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6839    12321   Dev_Pervious-C-Med-Confined   0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6839    12322   Dev_Pervious-C-Med-Unconfined 0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6839    12411   Dev_Pervious-D-Low-Confined   0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6839    12412   Dev_Pervious-D-Low-Unconfined 0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6839    12421   Dev_Pervious-D-Med-Confined   0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6839    12422   Dev_Pervious-D-Med-Unconfined 0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6839    13111   Agriculture-A-Low-Confined    0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6839    13112   Agriculture-A-Low-Unconfined  0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6839    13121   Agriculture-A-Med-Confined    0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6839    13122   Agriculture-A-Med-Unconfined  0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6839    13211   Agriculture-B-Low-Confined    0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6839    13212   Agriculture-B-Low-Unconfined  0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
```

```
6839    13221   Agriculture-B-Med-Confined    0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6839    13222   Agriculture-B-Med-Unconfined  0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6839    13231   Agriculture-B-High-Confined   0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6839    13232   Agriculture-B-High-Unconfined 0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6839    13311   Agriculture-C-Low-Confined    0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6839    13312   Agriculture-C-Low-Unconfined  0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6839    13321   Agriculture-C-Med-Confined    0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6839    13322   Agriculture-C-Med-Unconfined  0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6839    13331   Agriculture-C-High-Confined   0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6839    13411   Agriculture-D-Low-Confined    0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6839    13412   Agriculture-D-Low-Unconfined  0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6839    13421   Agriculture-D-Med-Confined    0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6839    13422   Agriculture-D-Med-Unconfined  0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6839    13431   Agriculture-D-High-Confined   0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6839    13432   Agriculture-D-High-Unconfined 0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6839    14121   Veg_Low-A-Med-Confined 0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6839    14122   Veg_Low-A-Med-Unconfined      0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6839    14131   Veg_Low-A-High-Confined       0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6839    14132   Veg_Low-A-High-Unconfined     0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6839    14221   Veg_Low-B-Med-Confined 0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6839    14222   Veg_Low-B-Med-Unconfined      0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6839    14231   Veg_Low-B-High-Confined       0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6839    14232   Veg_Low-B-High-Unconfined     0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6839    14321   Veg_Low-C-Med-Confined 0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6839    14322   Veg_Low-C-Med-Unconfined      0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6839    14331   Veg_Low-C-High-Confined       0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6839    14332   Veg_Low-C-High-Unconfined     0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6839    14421   Veg_Low-D-Med-Confined 0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6839    14422   Veg_Low-D-Med-Unconfined      0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6839    14431   Veg_Low-D-High-Confined       0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6839    14432   Veg_Low-D-High-Unconfined     0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6839    15121   Veg_High-A-Med-Confined       0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6839    15122   Veg_High-A-Med-Unconfined     0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6839    15131   Veg_High-A-High-Confined      0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6839    15132   Veg_High-A-High-Unconfined    0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6839    15221   Veg_High-B-Med-Confined       0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6839    15222   Veg_High-B-Med-Unconfined     0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6839    15231   Veg_High-B-High-Confined      0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6839    15232   Veg_High-B-High-Unconfined    0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
```

```
6839   15321   Veg_High-C-Med-Confined       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6839   15322   Veg_High-C-Med-Unconfined     0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6839   15331   Veg_High-C-High-Confined      0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6839   15332   Veg_High-C-High-Unconfined    0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6839   15421   Veg_High-D-Med-Confined       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6839   15422   Veg_High-D-Med-Unconfined     0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6839   15431   Veg_High-D-High-Confined      0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6839   15432   Veg_High-D-High-Unconfined    0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6839   16000   Water-All-All-All      0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6844   1000    Road_Freeway-All-All-All      0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6844   2000    Road_Primary-All-All-All      0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6844   3000    Road_Minor-All-All-All 0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6844   4000    Dev_ResHigh-All-All-All       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6844   5000    Dev_ResLow-All-All-All 0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6844   6000    Dev_Com-All-All-All    0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6844   7000    Dev_Ind-All-All-All    0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6844   8000    Dev_Inst-All-All-All   0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6844   9000    Dev_Roof-All-All-All   0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6844   10000   Dev_Overspray-All-All-All     0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6844   11111   Dev_Irrigated-A-Low-Confined  0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6844   11112   Dev_Irrigated-A-Low-Unconfined       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6844   11121   Dev_Irrigated-A-Med-Confined  0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6844   11122   Dev_Irrigated-A-Med-Unconfined       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6844   11211   Dev_Irrigated-B-Low-Confined  0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6844   11212   Dev_Irrigated-B-Low-Unconfined       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6844   11221   Dev_Irrigated-B-Med-Confined  0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6844   11222   Dev_Irrigated-B-Med-Unconfined       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6844   11311   Dev_Irrigated-C-Low-Confined  0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6844   11312   Dev_Irrigated-C-Low-Unconfined       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6844   11321   Dev_Irrigated-C-Med-Confined  0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6844   11322   Dev_Irrigated-C-Med-Unconfined       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6844   11411   Dev_Irrigated-D-Low-Confined  0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6844   11412   Dev_Irrigated-D-Low-Unconfined       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6844   11421   Dev_Irrigated-D-Med-Confined  0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6844   11422   Dev_Irrigated-D-Med-Unconfined       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6844   12111   Dev_Pervious-A-Low-Confined   0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6844   12112   Dev_Pervious-A-Low-Unconfined 0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6844   12121   Dev_Pervious-A-Med-Confined   0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6844   12122   Dev_Pervious-A-Med-Unconfined 0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
```

```
6844    12211   Dev_Pervious-B-Low-Confined   0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6844    12212   Dev_Pervious-B-Low-Unconfined 0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6844    12221   Dev_Pervious-B-Med-Confined   0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6844    12222   Dev_Pervious-B-Med-Unconfined 0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6844    12311   Dev_Pervious-C-Low-Confined   0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6844    12312   Dev_Pervious-C-Low-Unconfined 0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6844    12321   Dev_Pervious-C-Med-Confined   0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6844    12322   Dev_Pervious-C-Med-Unconfined 0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6844    12411   Dev_Pervious-D-Low-Confined   0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6844    12412   Dev_Pervious-D-Low-Unconfined 0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6844    12421   Dev_Pervious-D-Med-Confined   0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6844    12422   Dev_Pervious-D-Med-Unconfined 0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6844    13111   Agriculture-A-Low-Confined    0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6844    13112   Agriculture-A-Low-Unconfined  0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6844    13121   Agriculture-A-Med-Confined    0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6844    13122   Agriculture-A-Med-Unconfined  0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6844    13211   Agriculture-B-Low-Confined    0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6844    13212   Agriculture-B-Low-Unconfined  0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6844    13221   Agriculture-B-Med-Confined    0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6844    13222   Agriculture-B-Med-Unconfined  0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6844    13231   Agriculture-B-High-Confined   0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6844    13232   Agriculture-B-High-Unconfined 0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6844    13311   Agriculture-C-Low-Confined    0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6844    13312   Agriculture-C-Low-Unconfined  0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6844    13321   Agriculture-C-Med-Confined    0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6844    13322   Agriculture-C-Med-Unconfined  0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6844    13331   Agriculture-C-High-Confined   0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6844    13411   Agriculture-D-Low-Confined    0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6844    13412   Agriculture-D-Low-Unconfined  0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6844    13421   Agriculture-D-Med-Confined    0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6844    13422   Agriculture-D-Med-Unconfined  0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6844    13431   Agriculture-D-High-Confined   0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6844    13432   Agriculture-D-High-Unconfined 0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6844    14121   Veg_Low-A-Med-Confined 0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6844    14122   Veg_Low-A-Med-Unconfined      0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6844    14131   Veg_Low-A-High-Confined       0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6844    14132   Veg_Low-A-High-Unconfined     0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6844    14221   Veg_Low-B-Med-Confined 0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6844    14222   Veg_Low-B-Med-Unconfined      0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
```

```
6844    14231   Veg_Low-B-High-Confined       0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6844    14232   Veg_Low-B-High-Unconfined     0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6844    14321   Veg_Low-C-Med-Confined 0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6844    14322   Veg_Low-C-Med-Unconfined      0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6844    14331   Veg_Low-C-High-Confined       0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6844    14332   Veg_Low-C-High-Unconfined     0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6844    14421   Veg_Low-D-Med-Confined 0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6844    14422   Veg_Low-D-Med-Unconfined      0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6844    14431   Veg_Low-D-High-Confined       0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6844    14432   Veg_Low-D-High-Unconfined     0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6844    15121   Veg_High-A-Med-Confined       0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6844    15122   Veg_High-A-Med-Unconfined     0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6844    15131   Veg_High-A-High-Confined      0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6844    15132   Veg_High-A-High-Unconfined    0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6844    15221   Veg_High-B-Med-Confined       0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6844    15222   Veg_High-B-Med-Unconfined     0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6844    15231   Veg_High-B-High-Confined      0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6844    15232   Veg_High-B-High-Unconfined    0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6844    15321   Veg_High-C-Med-Confined       0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6844    15322   Veg_High-C-Med-Unconfined     0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6844    15331   Veg_High-C-High-Confined      0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6844    15332   Veg_High-C-High-Unconfined    0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6844    15421   Veg_High-D-Med-Confined       0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6844    15422   Veg_High-D-Med-Unconfined     0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6844    15431   Veg_High-D-High-Confined      0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6844    15432   Veg_High-D-High-Unconfined    0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6844    16000   Water-All-All-All      0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6850    1000    Road_Freeway-All-All-All      0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6850    2000    Road_Primary-All-All-All      0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6850    3000    Road_Minor-All-All-All 0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6850    4000    Dev_ResHigh-All-All-All       0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6850    5000    Dev_ResLow-All-All-All 0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6850    6000    Dev_Com-All-All-All    0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6850    7000    Dev_Ind-All-All-All    0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6850    8000    Dev_Inst-All-All-All   0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6850    9000    Dev_Roof-All-All-All   0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6850    10000   Dev_Overspray-All-All-All     0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6850    11111   Dev_Irrigated-A-Low-Confined  0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6850    11112   Dev_Irrigated-A-Low-Unconfined       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
```

```
6850    11121   Dev_Irrigated-A-Med-Confined  0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6850    11122   Dev_Irrigated-A-Med-Unconfined       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6850    11211   Dev_Irrigated-B-Low-Confined  0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6850    11212   Dev_Irrigated-B-Low-Unconfined       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6850    11221   Dev_Irrigated-B-Med-Confined  0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6850    11222   Dev_Irrigated-B-Med-Unconfined       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6850    11311   Dev_Irrigated-C-Low-Confined  0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6850    11312   Dev_Irrigated-C-Low-Unconfined       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6850    11321   Dev_Irrigated-C-Med-Confined  0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6850    11322   Dev_Irrigated-C-Med-Unconfined       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6850    11411   Dev_Irrigated-D-Low-Confined  0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6850    11412   Dev_Irrigated-D-Low-Unconfined       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6850    11421   Dev_Irrigated-D-Med-Confined  0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6850    11422   Dev_Irrigated-D-Med-Unconfined       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6850    12111   Dev_Pervious-A-Low-Confined   0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6850    12112   Dev_Pervious-A-Low-Unconfined 0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6850    12121   Dev_Pervious-A-Med-Confined   0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6850    12122   Dev_Pervious-A-Med-Unconfined 0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6850    12211   Dev_Pervious-B-Low-Confined   0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6850    12212   Dev_Pervious-B-Low-Unconfined 0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6850    12221   Dev_Pervious-B-Med-Confined   0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6850    12222   Dev_Pervious-B-Med-Unconfined 0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6850    12311   Dev_Pervious-C-Low-Confined   0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6850    12312   Dev_Pervious-C-Low-Unconfined 0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6850    12321   Dev_Pervious-C-Med-Confined   0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6850    12322   Dev_Pervious-C-Med-Unconfined 0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6850    12411   Dev_Pervious-D-Low-Confined   0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6850    12412   Dev_Pervious-D-Low-Unconfined 0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6850    12421   Dev_Pervious-D-Med-Confined   0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6850    12422   Dev_Pervious-D-Med-Unconfined 0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6850    13111   Agriculture-A-Low-Confined    0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6850    13112   Agriculture-A-Low-Unconfined  0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6850    13121   Agriculture-A-Med-Confined    0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6850    13122   Agriculture-A-Med-Unconfined  0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6850    13211   Agriculture-B-Low-Confined    0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6850    13212   Agriculture-B-Low-Unconfined  0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6850    13221   Agriculture-B-Med-Confined    0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6850    13222   Agriculture-B-Med-Unconfined  0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6850    13231   Agriculture-B-High-Confined   0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
```

```
6850    13232  Agriculture-B-High-Unconfined 0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6850    13311  Agriculture-C-Low-Confined    0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6850    13312  Agriculture-C-Low-Unconfined  0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6850    13321  Agriculture-C-Med-Confined    0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6850    13322  Agriculture-C-Med-Unconfined  0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6850    13331  Agriculture-C-High-Confined   0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6850    13411  Agriculture-D-Low-Confined    0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6850    13412  Agriculture-D-Low-Unconfined  0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6850    13421  Agriculture-D-Med-Confined    0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6850    13422  Agriculture-D-Med-Unconfined  0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6850    13431  Agriculture-D-High-Confined   0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6850    13432  Agriculture-D-High-Unconfined 0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6850    14121  Veg_Low-A-Med-Confined 0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6850    14122  Veg_Low-A-Med-Unconfined      0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6850    14131  Veg_Low-A-High-Confined       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6850    14132  Veg_Low-A-High-Unconfined     0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6850    14221  Veg_Low-B-Med-Confined 0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6850    14222  Veg_Low-B-Med-Unconfined      0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6850    14231  Veg_Low-B-High-Confined       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6850    14232  Veg_Low-B-High-Unconfined     0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6850    14321  Veg_Low-C-Med-Confined 0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6850    14322  Veg_Low-C-Med-Unconfined      0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6850    14331  Veg_Low-C-High-Confined       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6850    14332  Veg_Low-C-High-Unconfined     0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6850    14421  Veg_Low-D-Med-Confined 0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6850    14422  Veg_Low-D-Med-Unconfined      0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6850    14431  Veg_Low-D-High-Confined       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6850    14432  Veg_Low-D-High-Unconfined     0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6850    15121  Veg_High-A-Med-Confined       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6850    15122  Veg_High-A-Med-Unconfined     0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6850    15131  Veg_High-A-High-Confined      0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6850    15132  Veg_High-A-High-Unconfined    0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6850    15221  Veg_High-B-Med-Confined       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6850    15222  Veg_High-B-Med-Unconfined     0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6850    15231  Veg_High-B-High-Confined      0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6850    15232  Veg_High-B-High-Unconfined    0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6850    15321  Veg_High-C-Med-Confined       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6850    15322  Veg_High-C-Med-Unconfined     0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6850    15331  Veg_High-C-High-Confined      0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
```

```
6850    15332  Veg_High-C-High-Unconfined    0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6850    15421  Veg_High-D-Med-Confined       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6850    15422  Veg_High-D-Med-Unconfined     0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6850    15431  Veg_High-D-High-Confined      0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6850    15432  Veg_High-D-High-Unconfined    0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6850    16000  Water-All-All-All      0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6856    1000   Road_Freeway-All-All-All      0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6856    2000   Road_Primary-All-All-All      0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6856    3000   Road_Minor-All-All-All 0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6856    4000   Dev_ResHigh-All-All-All       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6856    5000   Dev_ResLow-All-All-All 0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6856    6000   Dev_Com-All-All-All    0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6856    7000   Dev_Ind-All-All-All    0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6856    8000   Dev_Inst-All-All-All   0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6856    9000   Dev_Roof-All-All-All   0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6856    10000  Dev_Overspray-All-All-All     0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6856    11111  Dev_Irrigated-A-Low-Confined  0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6856    11112  Dev_Irrigated-A-Low-Unconfined        0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6856    11121  Dev_Irrigated-A-Med-Confined  0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6856    11122  Dev_Irrigated-A-Med-Unconfined        0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6856    11211  Dev_Irrigated-B-Low-Confined  0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6856    11212  Dev_Irrigated-B-Low-Unconfined        0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6856    11221  Dev_Irrigated-B-Med-Confined  0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6856    11222  Dev_Irrigated-B-Med-Unconfined        0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6856    11311  Dev_Irrigated-C-Low-Confined  0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6856    11312  Dev_Irrigated-C-Low-Unconfined        0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6856    11321  Dev_Irrigated-C-Med-Confined  0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6856    11322  Dev_Irrigated-C-Med-Unconfined        0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6856    11411  Dev_Irrigated-D-Low-Confined  0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6856    11412  Dev_Irrigated-D-Low-Unconfined        0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6856    11421  Dev_Irrigated-D-Med-Confined  0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6856    11422  Dev_Irrigated-D-Med-Unconfined        0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6856    12111  Dev_Pervious-A-Low-Confined   0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6856    12112  Dev_Pervious-A-Low-Unconfined 0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6856    12121  Dev_Pervious-A-Med-Confined   0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6856    12122  Dev_Pervious-A-Med-Unconfined 0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6856    12211  Dev_Pervious-B-Low-Confined   0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6856    12212  Dev_Pervious-B-Low-Unconfined 0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6856    12221  Dev_Pervious-B-Med-Confined   0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
```

```
6856    12222   Dev_Pervious-B-Med-Unconfined 0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6856    12311   Dev_Pervious-C-Low-Confined   0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6856    12312   Dev_Pervious-C-Low-Unconfined 0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6856    12321   Dev_Pervious-C-Med-Confined   0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6856    12322   Dev_Pervious-C-Med-Unconfined 0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6856    12411   Dev_Pervious-D-Low-Confined   0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6856    12412   Dev_Pervious-D-Low-Unconfined 0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6856    12421   Dev_Pervious-D-Med-Confined   0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6856    12422   Dev_Pervious-D-Med-Unconfined 0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6856    13111   Agriculture-A-Low-Confined    0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6856    13112   Agriculture-A-Low-Unconfined  0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6856    13121   Agriculture-A-Med-Confined    0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6856    13122   Agriculture-A-Med-Unconfined  0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6856    13211   Agriculture-B-Low-Confined    0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6856    13212   Agriculture-B-Low-Unconfined  0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6856    13221   Agriculture-B-Med-Confined    0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6856    13222   Agriculture-B-Med-Unconfined  0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6856    13231   Agriculture-B-High-Confined   0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6856    13232   Agriculture-B-High-Unconfined 0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6856    13311   Agriculture-C-Low-Confined    0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6856    13312   Agriculture-C-Low-Unconfined  0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6856    13321   Agriculture-C-Med-Confined    0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6856    13322   Agriculture-C-Med-Unconfined  0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6856    13331   Agriculture-C-High-Confined   0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6856    13411   Agriculture-D-Low-Confined    0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6856    13412   Agriculture-D-Low-Unconfined  0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6856    13421   Agriculture-D-Med-Confined    0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6856    13422   Agriculture-D-Med-Unconfined  0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6856    13431   Agriculture-D-High-Confined   0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6856    13432   Agriculture-D-High-Unconfined 0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6856    14121   Veg_Low-A-Med-Confined 0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6856    14122   Veg_Low-A-Med-Unconfined      0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6856    14131   Veg_Low-A-High-Confined       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6856    14132   Veg_Low-A-High-Unconfined     0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6856    14221   Veg_Low-B-Med-Confined 0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6856    14222   Veg_Low-B-Med-Unconfined      0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6856    14231   Veg_Low-B-High-Confined       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6856    14232   Veg_Low-B-High-Unconfined     0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6856    14321   Veg_Low-C-Med-Confined 0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
```

```
6856   14322  Veg_Low-C-Med-Unconfined      0.000000       0.000000       0.000000       0.000000
0.000000      0.000000       0.000000       0.000000       0.000000       0.000000
6856   14331  Veg_Low-C-High-Confined       0.000000       0.000000       0.000000       0.000000
0.000000      0.000000       0.000000       0.000000       0.000000       0.000000
6856   14332  Veg_Low-C-High-Unconfined     0.000000       0.000000       0.000000       0.000000
0.000000      0.000000       0.000000       0.000000       0.000000       0.000000
6856   14421  Veg_Low-D-Med-Confined 0.000000       0.000000       0.000000       0.000000
0.000000      0.000000       0.000000       0.000000       0.000000       0.000000
6856   14422  Veg_Low-D-Med-Unconfined      0.000000       0.000000       0.000000       0.000000
0.000000      0.000000       0.000000       0.000000       0.000000       0.000000
6856   14431  Veg_Low-D-High-Confined       0.000000       0.000000       0.000000       0.000000
0.000000      0.000000       0.000000       0.000000       0.000000       0.000000
6856   14432  Veg_Low-D-High-Unconfined     0.000000       0.000000       0.000000       0.000000
0.000000      0.000000       0.000000       0.000000       0.000000       0.000000
6856   15121  Veg_High-A-Med-Confined       0.000000       0.000000       0.000000       0.000000
0.000000      0.000000       0.000000       0.000000       0.000000       0.000000
6856   15122  Veg_High-A-Med-Unconfined     0.000000       0.000000       0.000000       0.000000
0.000000      0.000000       0.000000       0.000000       0.000000       0.000000
6856   15131  Veg_High-A-High-Confined      0.000000       0.000000       0.000000       0.000000
0.000000      0.000000       0.000000       0.000000       0.000000       0.000000
6856   15132  Veg_High-A-High-Unconfined    0.000000       0.000000       0.000000       0.000000
0.000000      0.000000       0.000000       0.000000       0.000000       0.000000
6856   15221  Veg_High-B-Med-Confined       0.000000       0.000000       0.000000       0.000000
0.000000      0.000000       0.000000       0.000000       0.000000       0.000000
6856   15222  Veg_High-B-Med-Unconfined     0.000000       0.000000       0.000000       0.000000
0.000000      0.000000       0.000000       0.000000       0.000000       0.000000
6856   15231  Veg_High-B-High-Confined      0.000000       0.000000       0.000000       0.000000
0.000000      0.000000       0.000000       0.000000       0.000000       0.000000
6856   15232  Veg_High-B-High-Unconfined    0.000000       0.000000       0.000000       0.000000
0.000000      0.000000       0.000000       0.000000       0.000000       0.000000
6856   15321  Veg_High-C-Med-Confined       0.000000       0.000000       0.000000       0.000000
0.000000      0.000000       0.000000       0.000000       0.000000       0.000000
6856   15322  Veg_High-C-Med-Unconfined     0.000000       0.000000       0.000000       0.000000
0.000000      0.000000       0.000000       0.000000       0.000000       0.000000
6856   15331  Veg_High-C-High-Confined      0.000000       0.000000       0.000000       0.000000
0.000000      0.000000       0.000000       0.000000       0.000000       0.000000
6856   15332  Veg_High-C-High-Unconfined    0.000000       0.000000       0.000000       0.000000
0.000000      0.000000       0.000000       0.000000       0.000000       0.000000
6856   15421  Veg_High-D-Med-Confined       0.000000       0.000000       0.000000       0.000000
0.000000      0.000000       0.000000       0.000000       0.000000       0.000000
6856   15422  Veg_High-D-Med-Unconfined     0.000000       0.000000       0.000000       0.000000
0.000000      0.000000       0.000000       0.000000       0.000000       0.000000
6856   15431  Veg_High-D-High-Confined      0.000000       0.000000       0.000000       0.000000
0.000000      0.000000       0.000000       0.000000       0.000000       0.000000
6856   15432  Veg_High-D-High-Unconfined    0.000000       0.000000       0.000000       0.000000
0.000000      0.000000       0.000000       0.000000       0.000000       0.000000
6856   16000  Water-All-All-All      0.000000       0.000000       0.000000       0.000000
0.000000      0.000000       0.000000       0.000000       0.000000       0.000000
6859   1000   Road_Freeway-All-All-All      0.000000       0.000000       0.000000       0.000000
0.000000      0.000000       0.000000       0.000000       0.000000       0.000000
6859   2000   Road_Primary-All-All-All      0.000000       0.000000       0.000000       0.000000
0.000000      0.000000       0.000000       0.000000       0.000000       0.000000
6859   3000   Road_Minor-All-All-All 0.000000       0.000000       0.000000       0.000000
0.000000      0.000000       0.000000       0.000000       0.000000       0.000000
6859   4000   Dev_ResHigh-All-All-All       0.000000       0.000000       0.000000       0.000000
0.000000      0.000000       0.000000       0.000000       0.000000       0.000000
6859   5000   Dev_ResLow-All-All-All 0.000000       0.000000       0.000000       0.000000
0.000000      0.000000       0.000000       0.000000       0.000000       0.000000
6859   6000   Dev_Com-All-All-All    0.000000       0.000000       0.000000       0.000000
0.000000      0.000000       0.000000       0.000000       0.000000       0.000000
6859   7000   Dev_Ind-All-All-All    0.000000       0.000000       0.000000       0.000000
0.000000      0.000000       0.000000       0.000000       0.000000       0.000000
6859   8000   Dev_Inst-All-All-All   0.000000       0.000000       0.000000       0.000000
0.000000      0.000000       0.000000       0.000000       0.000000       0.000000
6859   9000   Dev_Roof-All-All-All   0.000000       0.000000       0.000000       0.000000
0.000000      0.000000       0.000000       0.000000       0.000000       0.000000
6859   10000  Dev_Overspray-All-All-All     0.000000       0.000000       0.000000       0.000000
0.000000      0.000000       0.000000       0.000000       0.000000       0.000000
6859   11111  Dev_Irrigated-A-Low-Confined  0.000000       0.000000       0.000000       0.000000
0.000000      0.000000       0.000000       0.000000       0.000000       0.000000
6859   11112  Dev_Irrigated-A-Low-Unconfined       0.000000       0.000000       0.000000
0.000000      0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6859   11121  Dev_Irrigated-A-Med-Confined  0.000000       0.000000       0.000000       0.000000
0.000000      0.000000       0.000000       0.000000       0.000000       0.000000
6859   11122  Dev_Irrigated-A-Med-Unconfined       0.000000       0.000000       0.000000
0.000000      0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6859   11211  Dev_Irrigated-B-Low-Confined  0.000000       0.000000       0.000000       0.000000
0.000000      0.000000       0.000000       0.000000       0.000000       0.000000
```

```
6859    11212   Dev_Irrigated-B-Low-Unconfined        0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6859    11221   Dev_Irrigated-B-Med-Confined  0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6859    11222   Dev_Irrigated-B-Med-Unconfined        0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6859    11311   Dev_Irrigated-C-Low-Confined  0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6859    11312   Dev_Irrigated-C-Low-Unconfined        0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6859    11321   Dev_Irrigated-C-Med-Confined  0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6859    11322   Dev_Irrigated-C-Med-Unconfined        0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6859    11411   Dev_Irrigated-D-Low-Confined  0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6859    11412   Dev_Irrigated-D-Low-Unconfined        0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6859    11421   Dev_Irrigated-D-Med-Confined  0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6859    11422   Dev_Irrigated-D-Med-Unconfined        0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6859    12111   Dev_Pervious-A-Low-Confined   0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6859    12112   Dev_Pervious-A-Low-Unconfined 0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6859    12121   Dev_Pervious-A-Med-Confined   0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6859    12122   Dev_Pervious-A-Med-Unconfined 0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6859    12211   Dev_Pervious-B-Low-Confined   0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6859    12212   Dev_Pervious-B-Low-Unconfined 0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6859    12221   Dev_Pervious-B-Med-Confined   0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6859    12222   Dev_Pervious-B-Med-Unconfined 0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6859    12311   Dev_Pervious-C-Low-Confined   0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6859    12312   Dev_Pervious-C-Low-Unconfined 0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6859    12321   Dev_Pervious-C-Med-Confined   0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6859    12322   Dev_Pervious-C-Med-Unconfined 0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6859    12411   Dev_Pervious-D-Low-Confined   0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6859    12412   Dev_Pervious-D-Low-Unconfined 0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6859    12421   Dev_Pervious-D-Med-Confined   0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6859    12422   Dev_Pervious-D-Med-Unconfined 0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6859    13111   Agriculture-A-Low-Confined    0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6859    13112   Agriculture-A-Low-Unconfined  0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6859    13121   Agriculture-A-Med-Confined    0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6859    13122   Agriculture-A-Med-Unconfined  0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6859    13211   Agriculture-B-Low-Confined    0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6859    13212   Agriculture-B-Low-Unconfined  0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6859    13221   Agriculture-B-Med-Confined    0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6859    13222   Agriculture-B-Med-Unconfined  0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6859    13231   Agriculture-B-High-Confined   0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6859    13232   Agriculture-B-High-Unconfined 0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6859    13311   Agriculture-C-Low-Confined    0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6859    13312   Agriculture-C-Low-Unconfined  0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
```

```
6859   13321   Agriculture-C-Med-Confined    0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6859   13322   Agriculture-C-Med-Unconfined  0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6859   13331   Agriculture-C-High-Confined   0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6859   13411   Agriculture-D-Low-Confined    0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6859   13412   Agriculture-D-Low-Unconfined  0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6859   13421   Agriculture-D-Med-Confined    0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6859   13422   Agriculture-D-Med-Unconfined  0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6859   13431   Agriculture-D-High-Confined   0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6859   13432   Agriculture-D-High-Unconfined 0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6859   14121   Veg_Low-A-Med-Confined 0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6859   14122   Veg_Low-A-Med-Unconfined      0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6859   14131   Veg_Low-A-High-Confined       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6859   14132   Veg_Low-A-High-Unconfined     0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6859   14221   Veg_Low-B-Med-Confined 0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6859   14222   Veg_Low-B-Med-Unconfined      0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6859   14231   Veg_Low-B-High-Confined       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6859   14232   Veg_Low-B-High-Unconfined     0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6859   14321   Veg_Low-C-Med-Confined 0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6859   14322   Veg_Low-C-Med-Unconfined      0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6859   14331   Veg_Low-C-High-Confined       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6859   14332   Veg_Low-C-High-Unconfined     0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6859   14421   Veg_Low-D-Med-Confined 0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6859   14422   Veg_Low-D-Med-Unconfined      0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6859   14431   Veg_Low-D-High-Confined       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6859   14432   Veg_Low-D-High-Unconfined     0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6859   15121   Veg_High-A-Med-Confined       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6859   15122   Veg_High-A-Med-Unconfined     0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6859   15131   Veg_High-A-High-Confined      0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6859   15132   Veg_High-A-High-Unconfined    0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6859   15221   Veg_High-B-Med-Confined       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6859   15222   Veg_High-B-Med-Unconfined     0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6859   15231   Veg_High-B-High-Confined      0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6859   15232   Veg_High-B-High-Unconfined    0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6859   15321   Veg_High-C-Med-Confined       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6859   15322   Veg_High-C-Med-Unconfined     0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6859   15331   Veg_High-C-High-Confined      0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6859   15332   Veg_High-C-High-Unconfined    0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6859   15421   Veg_High-D-Med-Confined       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6859   15422   Veg_High-D-Med-Unconfined     0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
```

```
6859    15431  Veg_High-D-High-Confined      0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6859    15432  Veg_High-D-High-Unconfined    0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6859    16000  Water-All-All-All      0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6861    1000   Road_Freeway-All-All-All      0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6861    2000   Road_Primary-All-All-All      0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6861    3000   Road_Minor-All-All-All 0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6861    4000   Dev_ResHigh-All-All-All       0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6861    5000   Dev_ResLow-All-All-All 0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6861    6000   Dev_Com-All-All-All    0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6861    7000   Dev_Ind-All-All-All    0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6861    8000   Dev_Inst-All-All-All   0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6861    9000   Dev_Roof-All-All-All   0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6861    10000  Dev_Overspray-All-All-All     0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6861    11111  Dev_Irrigated-A-Low-Confined  0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6861    11112  Dev_Irrigated-A-Low-Unconfined        0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6861    11121  Dev_Irrigated-A-Med-Confined  0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6861    11122  Dev_Irrigated-A-Med-Unconfined        0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6861    11211  Dev_Irrigated-B-Low-Confined  0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6861    11212  Dev_Irrigated-B-Low-Unconfined        0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6861    11221  Dev_Irrigated-B-Med-Confined  0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6861    11222  Dev_Irrigated-B-Med-Unconfined        0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6861    11311  Dev_Irrigated-C-Low-Confined  0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6861    11312  Dev_Irrigated-C-Low-Unconfined        0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6861    11321  Dev_Irrigated-C-Med-Confined  0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6861    11322  Dev_Irrigated-C-Med-Unconfined        0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6861    11411  Dev_Irrigated-D-Low-Confined  0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6861    11412  Dev_Irrigated-D-Low-Unconfined        0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6861    11421  Dev_Irrigated-D-Med-Confined  0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6861    11422  Dev_Irrigated-D-Med-Unconfined        0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6861    12111  Dev_Pervious-A-Low-Confined   0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6861    12112  Dev_Pervious-A-Low-Unconfined 0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6861    12121  Dev_Pervious-A-Med-Confined   0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6861    12122  Dev_Pervious-A-Med-Unconfined 0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6861    12211  Dev_Pervious-B-Low-Confined   0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6861    12212  Dev_Pervious-B-Low-Unconfined 0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6861    12221  Dev_Pervious-B-Med-Confined   0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6861    12222  Dev_Pervious-B-Med-Unconfined 0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6861    12311  Dev_Pervious-C-Low-Confined   0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
6861    12312  Dev_Pervious-C-Low-Unconfined 0.000000       0.000000       0.000000       0.000000
0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
```

```
6861    12321   Dev_Pervious-C-Med-Confined   0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6861    12322   Dev_Pervious-C-Med-Unconfined 0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6861    12411   Dev_Pervious-D-Low-Confined   0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6861    12412   Dev_Pervious-D-Low-Unconfined 0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6861    12421   Dev_Pervious-D-Med-Confined   0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6861    12422   Dev_Pervious-D-Med-Unconfined 0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6861    13111   Agriculture-A-Low-Confined    0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6861    13112   Agriculture-A-Low-Unconfined  0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6861    13121   Agriculture-A-Med-Confined    0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6861    13122   Agriculture-A-Med-Unconfined  0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6861    13211   Agriculture-B-Low-Confined    0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6861    13212   Agriculture-B-Low-Unconfined  0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6861    13221   Agriculture-B-Med-Confined    0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6861    13222   Agriculture-B-Med-Unconfined  0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6861    13231   Agriculture-B-High-Confined   0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6861    13232   Agriculture-B-High-Unconfined 0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6861    13311   Agriculture-C-Low-Confined    0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6861    13312   Agriculture-C-Low-Unconfined  0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6861    13321   Agriculture-C-Med-Confined    0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6861    13322   Agriculture-C-Med-Unconfined  0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6861    13331   Agriculture-C-High-Confined   0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6861    13411   Agriculture-D-Low-Confined    0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6861    13412   Agriculture-D-Low-Unconfined  0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6861    13421   Agriculture-D-Med-Confined    0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6861    13422   Agriculture-D-Med-Unconfined  0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6861    13431   Agriculture-D-High-Confined   0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6861    13432   Agriculture-D-High-Unconfined 0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6861    14121   Veg_Low-A-Med-Confined 0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6861    14122   Veg_Low-A-Med-Unconfined      0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6861    14131   Veg_Low-A-High-Confined       0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6861    14132   Veg_Low-A-High-Unconfined     0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6861    14221   Veg_Low-B-Med-Confined 0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6861    14222   Veg_Low-B-Med-Unconfined      0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6861    14231   Veg_Low-B-High-Confined       0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6861    14232   Veg_Low-B-High-Unconfined     0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6861    14321   Veg_Low-C-Med-Confined 0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6861    14322   Veg_Low-C-Med-Unconfined      0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6861    14331   Veg_Low-C-High-Confined       0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
6861    14332   Veg_Low-C-High-Unconfined     0.000000       0.000000       0.000000       0.000000
0.000000        0.000000       0.000000       0.000000       0.000000       0.000000
```

```
        6861    14421   Veg_Low-D-Med-Confined 0.000000       0.000000       0.000000       0.000000
        0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
        6861    14422   Veg_Low-D-Med-Unconfined       0.000000       0.000000       0.000000       0.000000
        0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
        6861    14431   Veg_Low-D-High-Confined        0.000000       0.000000       0.000000       0.000000
        0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
        6861    14432   Veg_Low-D-High-Unconfined      0.000000       0.000000       0.000000       0.000000
        0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
        6861    15121   Veg_High-A-Med-Confined        0.000000       0.000000       0.000000       0.000000
        0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
        6861    15122   Veg_High-A-Med-Unconfined      0.000000       0.000000       0.000000       0.000000
        0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
        6861    15131   Veg_High-A-High-Confined       0.000000       0.000000       0.000000       0.000000
        0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
        6861    15132   Veg_High-A-High-Unconfined     0.000000       0.000000       0.000000       0.000000
        0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
        6861    15221   Veg_High-B-Med-Confined        0.000000       0.000000       0.000000       0.000000
        0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
        6861    15222   Veg_High-B-Med-Unconfined      0.000000       0.000000       0.000000       0.000000
        0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
        6861    15231   Veg_High-B-High-Confined       0.000000       0.000000       0.000000       0.000000
        0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
        6861    15232   Veg_High-B-High-Unconfined     0.000000       0.000000       0.000000       0.000000
        0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
        6861    15321   Veg_High-C-Med-Confined        0.000000       0.000000       0.000000       0.000000
        0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
        6861    15322   Veg_High-C-Med-Unconfined      0.000000       0.000000       0.000000       0.000000
        0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
        6861    15331   Veg_High-C-High-Confined       0.000000       0.000000       0.000000       0.000000
        0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
        6861    15332   Veg_High-C-High-Unconfined     0.000000       0.000000       0.000000       0.000000
        0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
        6861    15421   Veg_High-D-Med-Confined        0.000000       0.000000       0.000000       0.000000
        0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
        6861    15422   Veg_High-D-Med-Unconfined      0.000000       0.000000       0.000000       0.000000
        0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
        6861    15431   Veg_High-D-High-Confined       0.000000       0.000000       0.000000       0.000000
        0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
        6861    15432   Veg_High-D-High-Unconfined     0.000000       0.000000       0.000000       0.000000
        0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
        6861    16000   Water-All-All-All      0.000000       0.000000       0.000000       0.000000
        0.000000       0.000000       0.000000       0.000000       0.000000       0.000000
c--------------------------------------------------------------------------------------------
c680 TMDL reach control (used if ncrch > 0 on card 600)
c
c    rchid         controlled reach id
c    outlet        controlled reach outlet id
c    switch_mon    monthly switch to control conc limit or reduction of pollutant from the corresponding reach
(0-off, 1-on)
c
c   rchid   outlet   switch_1   switch_2......switch_12
c--------------------------------------------------------------------------------------------
c685 TMDL reach control (used if ncrch > 0 on card 600)
c
c    rchid         controlled reach id
c    outlet        controlled reach outlet id
c    limit-flow    flow limit from the corresponding reach (cfs)
c    limit_pol     concentration limit of pollutant from the corresponding reach (mg/l or ug/l or #/100ml)
c
c   rchid   outlet   limit_flow   limit_qual1...limit_qual2...limit_qualn
c--------------------------------------------------------------------------------------------
c690 TMDL reach control (used if ncrch > 0 on card 600)
c
c    rchid         controlled reach id
c    outlet        controlled reach outlet id
c    reduction     reduction of pollutant from the corresponding reach (fraction)
c                  reduction in outflow will also reduce the pollutant mass from the outflow and
c                  any defined reduction to pollutant will be the additional
c
c   rchid   outlet   reduction_flow...reduction_qual1...reduction_qual2...reduction_qualn
c--------------------------------------------------------------------------------------------
```

## SUSTAIN Model Input

```
c---------------------------------------------------------------------------------------------------------------
-----------
c
```

```
c SUSTAIN: System for Urban Stormwater Treatment and Analysis INtegration
c Version 2.1 - Jan 2020
c
c Created through code updates by:
c Paradigm Environmental, Inc.
c San Diego, California, USA
c www.paradigmh2o.com
c
c Based upon SUSTAIN version 1.2 (Apr 2014), originally developed by:
c United States Environmental Protection Agency
c Office of Research & Development
c with support by Tetra Tech, Inc.
c https://www.epa.gov/water-research/system-urban-stormwater-treatment-and-analysis-integration-sustain
c
c NOTE: The line starting with the letter c and followed by space or - is a comment line.
c       There must be no comment line in between the data lines
c       The input text field must be a continuous string without any space in between the characters
c
c---------------------------------------------------------------------------------------------------------------
-----------
c700 Model Controls
c
c LINE1 = Land simulation control (0-external),
c         Land output directory path (containing unit-area land output timeseries)
c         Note: external land timeseries data must be in this order;
c               flow (in./timestep),
c               groundwater recharge (in./timestep),
c               pollutant 1 (lb/acre/timestep),
c               pollutant2, ...
c LINE2 = Start date of simulation (Year Month Day)
c LINE3 = End date of simulation (Year Month Day)
c LINE4 = Land Timeseries timestep (Minute),
c         BMP simulation timestep (Minute),
c         CRRAT = The ratio of max velocity to mean velocity under typical flow conditions (value of 1.0 or
greater),
c         Model output control (0-same timestep as land time series; 1-hourly),
c         Model output directory path
c LINE5 = PET Flag (0-constant monthly PET, 1-PET from the timeseries (in/timestep as land time series),
c         PET time series file path (required if PET flag is 1)
c LINE6 = Monthly PET rate (in/day) if PET flag is 0   OR
c         Monthly PET coefficient (multiplier to PET value) if PET flag is 1
c
0       C:\SUSTAIN_X64\LA0583005\Timeseries\85P
2010    1       4
2010    1       6
60      5       1.5     1       C:\SUSTAIN_X64\LA0583005\Output\85P
0
0.0632  0.0798  0.1174  0.1507  0.1626  0.1787  0.1897  0.1855  0.1547  0.1047  0.0715  0.0531
c---------------------------------------------------------------------------------------------------------------
-----------
c705 Pollutant Definition
c
c POLLUT_ID   = Unique pollutant identifier (Sequence number same as in land output time series)
c POLLUT_NAME = Unique pollutant name
c MULTIPLIER  = Multiplying factor used to convert the pollutant load to lbs (external control)
c SED_FLAG    = The sediment flag (0-not sediment,1-sand,2-silt,3-clay,4-total sediment)
c               if = 4 SEDIMENT will be splitted into sand, silt,and clay based on the fractions defined in card
710.
c SED_QUAL    = The sediment-associated pollutant flag (0-no, 1-yes)
c               if = 1 then SEDIMENT is required in the pollutant list
c SAND_QFRAC  = The sediment-associated qual-fraction on sand (0-1), only required if SED_QUAL = 1
c SILT_QFRAC  = The sediment-associated qual-fraction on silt (0-1), only required if SED_QUAL = 1
c CLAY_QFRAC  = The sediment-associated qual-fraction on clay (0-1), only required if SED_QUAL = 1
c
c POLLUT_ID    POLLUT_NAME    MULTIPLIER     SED_FLAG       SED_QUAL       SAND_QFRAC     SILT_QFRAC
        CLAY_QFRAC
1       TSS     2240    0       0       0       0       0
2       TN      1       0       0       0       0       0
3       TP      1       0       0       0       0       0
4       TCD     1       0       0       0       0       0
5       TCU     1       0       0       0       0       0
6       TPB     1       0       0       0       0       0
7       TZN     1       0       0       0       0       0
c---------------------------------------------------------------------------------------------------------------
-----------
c710 LAND USE DEFINITION (required if land simulation control is external)
c
c LANDTYPE       = Unique land use definition identifier
c LANDNAME       = land use name
```

```
c IMPERVIOUS     = Distinguishes pervious/impervious land unit (0-pervious; 1-impervious)
c TIMESERIESFILE = File name containing input timeseries
c SAND_FRAC      = The fraction of total sediment from the land which is sand (0-1)
c SILT_FRAC      = The fraction of total sediment from the land which is silt (0-1)
c CLAY_FRAC      = The fraction of total sediment from the land which is clay (0-1)
c
c LANDTYPE     LANDNAME       IMPERVIOUS     TIMESERIESFILE SAND_FRAC      SILT_FRAC      CLAY_FRAC
1      Road_Freeway-All-All-All      1      1000_Road_Freeway-All-All-All.txt    0      0.55   0.4
c---------------------------------------------------------------------------------------------------------------
-----------
c712 Aquifer INFORMATION
c
c AquiferID       = Unique Aquifer identifier
c AquiferNAME     = Aquifer name
c Initial Storage = Initial Storage (ac-ft)
c RecessionCoef   = Recession Coefficient (1/hr)
c SeepageCoef     = Seepage Coefficient (1/hr)
c
c AquiferID    AquiferNAME    InitialStorage RecessionCoef  SeepageCoef
c---------------------------------------------------------------------------------------------------------------
-----------
c713 Aquifer Pollutant Background Concentration
c
c AquiferID = Unique Aquifer identifier as in c712
c Ci        = Background concentration for pollutant i (mg/l)
c             Where i = 1 to N (N = Number of QUAL from card 705)
c
c AQUIFER_ID   QUALC1  QUALC2 ... QUALCN
c---------------------------------------------------------------------------------------------------------------
-----------
c715 BMP SITE INFORMATION
c
c BMPSITE   = Unique BMP site identifier
c BMPNAME   = BMP template name or site name
c BMPTYPE   = Unique BMP Types (must use the exact same keyword)
c
(BIORETENTION,WETPOND,CISTERN,DRYPOND,INFILTRATIONTRENCH,GREENROOF,POROUSPAVEMENT,RAINBARREL,REGULATOR,SWALE,CON
DUIT,BUFFERSTRIP,AREABMP)
c DArea     = Total Drainage Area in acre
c NUMUNIT   = Number of BMP structures
c DDAREA    = Design drainage area of the BMP structure (acre)
c PreLUType = Predevelopment land use type (for external land simulation option)
c AquiferID = Unique Aquifer ID, 0 --- no aquifer (for external land simulation option)
c FtableFLG = Ftable flag, 0 = no, 1 = yes (for BMP Class A, B, and C)
c FTABLE_ID = Unique Ftable identifier (continuous string) as in card 714
c
c BMPSITE      BMPNAME BMPTYPE DArea   NUMUNIT DDAREA  PreLUType      AquiferID      FtableFLG      FTABLE_ID
out     SubwatershedOutlet     JUNCTION       0      1      0      1      0      0      No      0
ut      UntreatedFlow  JUNCTION       0      1      0      1      0      0      No      0
TBDBMP  BioretentionType1      BIORETENTION   0      1      0      1      0      0      No      0
DW_6665 BioretentionType1      INFILTRATIONTRENCH    1      1      0      1      0      0      No      0
DW_6671 BioretentionType1      INFILTRATIONTRENCH    1      1      0      1      0      0      No      0
DW_6673 BioretentionType1      INFILTRATIONTRENCH    1      1      0      1      0      0      No      0
DW_6674 BioretentionType1      INFILTRATIONTRENCH    1      1      0      1      0      0      No      0
DW_6675 BioretentionType1      INFILTRATIONTRENCH    1      1      0      1      0      0      No      0
DW_6684 BioretentionType1      INFILTRATIONTRENCH    1      1      0      1      0      0      No      0
DW_6839 BioretentionType1      INFILTRATIONTRENCH    1      1      0      1      0      0      No      0
DW_6844 BioretentionType1      INFILTRATIONTRENCH    1      1      0      1      0      0      No      0
DW_6850 BioretentionType1      INFILTRATIONTRENCH    1      1      0      1      0      0      No      0
DW_6856 BioretentionType1      INFILTRATIONTRENCH    1      1      0      1      0      0      No      0
DW_6859 BioretentionType1      INFILTRATIONTRENCH    1      1      0      1      0      0      No      0
DW_6861 BioretentionType1      INFILTRATIONTRENCH    1      1      0      1      0      0      No      0
sewer   Sewer   JUNCTION       0      1      0      1      0      0      0      0
c---------------------------------------------------------------------------------------------------------------
-----------
c720 Point Source Definition
c
c point source timeseries data must be in this order;  flow (in.-acre/timestep), pollutant 1 (lbs/timestep),
pollutant2, ...
c
c POINTSOURCE    = Unique point source identifier
c DESCRIPTION    = point source description (a continuous string without any space)
c BMPSITE        = BMP site identifier in card 715
c MULTIPLIER     = Multiplier applied to the timeseries file (flow and pollutants). It will be in addition to
the pollutant multiplier in card 705
c TIMESERIESFILE = File name containing input timeseries
c SAND_FRAC      = The fraction of total sediment which is sand (0-1)
c SILT_FRAC      = The fraction of total sediment which is silt (0-1)
c CLAY_FRAC      = The fraction of total sediment which is clay (0-1)
```

```
c
c POINTSOURCE  BMPSITE MULTIPLIER    TIMESERIESFILE SAND_FRAC      SILT_FRAC      CLAY_FRAC
1      Inflow_1       DW_6665 1      6665.out       0      0      0
2      Inflow_2       DW_6671 1      6671.out       0      0      0
3      Inflow_3       DW_6673 1      6673.out       0      0      0
4      Inflow_4       DW_6674 1      6674.out       0      0      0
5      Inflow_5       DW_6675 1      6675.out       0      0      0
6      Inflow_6       DW_6684 1      6684.out       0      0      0
7      Inflow_7       DW_6839 1      6839.out       0      0      0
8      Inflow_8       DW_6844 1      6844.out       0      0      0
9      Inflow_9       DW_6850 1      6850.out       0      0      0
10     Inflow_10      DW_6856 1      6856.out       0      0      0
11     Inflow_11      DW_6859 1      6859.out       0      0      0
12     Inflow_12      DW_6861 1      6861.out       0      0      0
c--------------------------------------------------------------------------------------------
c721 Tier-1 Watershed Outlets Definition
c
c BMPSITE     = BMP site (watershed outlet) identifier in card 715
c NUMBREAKS   = Number of break points on the cost-effectiveness curve
c CECurveFile = CECurve_Solutions file for the project cost (sorted cost value) of each break point
c
c BMPSITE      NUMBREAKS      CECurveFile
c---------------------------------------------------------------------------------------------------------------
-----------
c722 Tier-1 Watershed Timeseries Definition
c
c BMPSITE        = BMP site (watershed outlet) identifier in card 721
c BREAKPOINTID   = Unique break point id on cost-effectiveness curve
c                  (0 for initial, -1 for PreDev, and -2 for PostDev condition)
c MULTIPLIER     = Multiplier applied to the timeseries file
c TIMESERIESFILE = Timeseries output file corresponding to the breakpoint id
c
c  BMPSITE     BREAKPOINTID   MULTIPLIER     TIMESERIESFILE
c---------------------------------------------------------------------------------------------------------------
-----------
c723 Pump Curve (applies if PUMP_FLG is ON in card 725)
c
c PUMP_CURVE = The unique name of pump curve (continuous string without space)
c NUM_RECORD = Number of points on the curve
c
c DEPTH      = Depth (ft)
c FLOW       = Pumping flow rate (cfs)
c
c PUMP_CURVE   NUM_RECORD
c DEPTH FLOW
Qinf_6665      2
0       8
50      8
Qinf_6671      2
0       4.8
50      4.8
Qinf_6673      2
0       7.2
50      7.2
Qinf_6674      2
0       4.8
50      4.8
Qinf_6675      2
0       2.4
50      2.4
Qinf_6684      2
0       0.8
50      0.8
Qinf_6839      2
0       22.4
50      22.4
Qinf_6844      2
0       10.4
50      10.4
Qinf_6850      2
0       31.2
50      31.2
Qinf_6856      2
0       11.2
50      11.2
Qinf_6859      2
0       32
50      32
Qinf_6861      2
```

```
0       19.2
50      19.2
c---------------------------------------------------------------------------------------------------------------
-----------
c725 CLASS-A BMP Site Parameters (required if BMPSITE is CLASS-A in card 715)
c
c BMPSITE = Class A BMP dimension group identifier in card 715
c WIDTH   = Basin bottom width (ft)
c LENGTH  = Basin bottom length (ft) / diameter (ft) for rain barrel or cistern
c OHEIGHT = Orifice Height (ft)
c DIAM    = Orifice Diameter (in)
c CCOEF   = Contraction Coefficient, user-specified value between 0 and 1 (e.g., Rounded = 1.0, Short Tube =
0.8, Sharp-edged = 0.61, Borda = 0.5)
c RELTP   = Release Type   (1-Cistern, 2-Rain barrel, 3-others)
c PEOPLE  = Number of persons (Cistern Option)
c DDAYS   = Number of dry days (Rain Barrel Option)
c WEIRTP  = Weir Type   (1-Rectangular,2-Triangular)
c WEIRH   = Weir Height (ft)
c WEIRW   = (weir type 1) Weir width  (ft)
c THETA   = (weir type 2) Weir angle  (degrees)
c ET_MULT = multiplier to PET
c PUMP_FLG = pump option (0-OFF, 1-ON)
c DEPTH_ON = water Depth (ft) at which the pump is started
c DEPTH_OFF = water Depth (ft) at which the pump is stopped
c PUMP_CURVE = The unique name of pump curve (continuous string without space)
c BYPASS_FRAC = Fraction of inflow that bypasses the BMP when full (0.0-1.0)
c DIV_RATE   = Maximum flow diversion rate into BMP (cfs)
c
c BMPSITE   WIDTH   LENGTH  OHEIGHT DIAM    EXITYPE RELEASETYPE PEOPLE  DDAYS  WEIRTYPE WEIRH WEIRW THETA
ET_MULT PUMP_FLG DEPTH_ON DEPTH_OFF PUMP_CURVE      BYPASS_FRAC    DIV_RATE
TBDBMP  0       0       0       0       0.61    3       0       0       1       0.5     10000   0       0       0
        0       0       none    0       -1
DW_6665 10      7.16    0       0.1     0.61    3       0       0       1       45      10000   0       0       1
        5       1       Qinf_6665       0       -1
DW_6671 10      4.29    0       0.1     0.61    3       0       0       1       45      10000   0       0       1
        5       1       Qinf_6671       0       -1
DW_6673 10      6.44    0       0.1     0.61    3       0       0       1       45      10000   0       0       1
        5       1       Qinf_6673       0       -1
DW_6674 10      4.29    0       0.1     0.61    3       0       0       1       45      10000   0       0       1
        5       1       Qinf_6674       0       -1
DW_6675 10      2.15    0       0.1     0.61    3       0       0       1       45      10000   0       0       1
        5       1       Qinf_6675       0       -1
DW_6684 10      0.72    0       0.1     0.61    3       0       0       1       45      10000   0       0       1
        5       1       Qinf_6684       0       -1
DW_6839 10      20.04   0       0.1     0.61    3       0       0       1       45      10000   0       0       1
        5       1       Qinf_6839       0       -1
DW_6844 10      9.30    0       0.1     0.61    3       0       0       1       45      10000   0       0       1
        5       1       Qinf_6844       0       -1
DW_6850 10      27.91   0       0.1     0.61    3       0       0       1       45      10000   0       0       1
        5       1       Qinf_6850       0       -1
DW_6856 10      10.02   0       0.1     0.61    3       0       0       1       45      10000   0       0       1
        5       1       Qinf_6856       0       -1
DW_6859 10      28.62   0       0.1     0.61    3       0       0       1       45      10000   0       0       1
        5       1       Qinf_6859       0       -1
DW_6861 10      17.17   0       0.1     0.61    3       0       0       1       45      10000   0       0       1
        5       1       Qinf_6861       0       -1
c---------------------------------------------------------------------------------------------------------------
-----------
c730  Cistern Control Water Release Curve (applies if release type is cistern in card 725)
c
c BMPSITE = Class A BMP dimension group identifier in card 715
c Flow    = Hourly water release per capita from the Cistern Control (ft3/hr/capita)
c
c BMPSITE      FLOW
TBDBMP  0       0       0       0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0
DW_6665 0       0       0       0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0
DW_6671 0       0       0       0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0
DW_6673 0       0       0       0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0
DW_6674 0       0       0       0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0
DW_6675 0       0       0       0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0
DW_6684 0       0       0       0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0
```

```
DW_6839 0       0       0       0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0
DW_6844 0       0       0       0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0
DW_6850 0       0       0       0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0
DW_6856 0       0       0       0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0
DW_6859 0       0       0       0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0
DW_6861 0       0       0       0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0
c-----------------------------------------------------------------------------------------------------------------------
-----------
c735 CLASS B BMP Site DIMENSION GROUPS
c
c BMPSITE  = BMP Site identifier in card 715
c WIDTH    = basin bottom width (ft)
c LENGTH   = basin bottom Length (ft)
c MAXDEPTH = Maximum depth of channel (ft)
c SLOPE1   = Side slope 1 (ft/ft)
c SLOPE2   = Side slope 2 (ft/ft)   (1-4)
c SLOPE3   = Side slope 3 (ft/ft)
c MANN_N   = Manning  's roughness coefficient
c ET_MULT  = multiplier to PET
c
c BMPSITE      WIDTH   LENGTH  MAXDEPTH       SLOPE1  SLOPE2  SLOPE3  MANN_N  ET_MULT
c-----------------------------------------------------------------------------------------------------------------------
-----------
c740 BMP Site BOTTOM SOIL/VEGITATION CHARACTERISTICS
c
c BMPSITE   =  BMPSITE identifier in c715
c INFILTM   =  Infiltration Method (0-Green Ampt, 1-Horton, 2-Holtan)
c POLROTM   =  Pollutant Routing Method (1-Completely mixed, >1-number of CSTRs in series)
c POLREMM   =  Pollutant Removal Method (0-1st order decay, 1-kadlec and knight method, 2-user defined
concentration)
c SDEPTH    =  Soil Depth (ft)
c POROSITY  =  Soil Porosity (0-1)
c FCAPACITY =  Soil Field Capacity (ft/ft)
c WPOINT    =  Soil Wilting Point (ft/ft)
c AVEG      =  Vegetative Parameter A (0.1-1.0) (Empirical), only required for Holtan infiltration method
c FINFILT   =  Soil layer infiltration rate (in/hr)
c UNDSWITCH =  Underdrain option (0-No underdrain, 1-underdrain with percent removal rate, 2-underdrain with
constant effluent conc.)
c UNDDEPTH  =  Depth of storage media below underdrain (ft)
c UNDVOID   =  Fraction of underdrain storage depth that is void space (0-1)
c UNDINFILT =  Background infiltration rate, below underdrain (in/hr)
c SUCTION   =  Average value of soil capillary suction along the wetting front, value must be greater than zero
(in), only required for Green-Ampt infiltration method
c IMDMAX    =  Difference between soil porosity and initial moisture content, value must be greater than or
equal to zero (a fraction), only required for Green-Ampt infiltration method
c MAXINFILT =  Maximum rate on the Horton infiltration curve (in/hr), only required for Horton infiltration
method
c DECAYCONS =  Decay constant for the Horton infiltration curve (1/hr), only required for Horton infiltration
method
c DRYTIME   =  Time for a fully staurated soil to completely dry (day), only required for Horton infiltration
method
c MAXVOLUME =  Maximum infiltration volume possible (in), only required for Horton infiltration method
c
c BMPSITE   INFILTM POLROTM POLREMM SDEPTH  POROSITY    FCAPACITY   WPOINT  AVEG    FINFILT UNDSWITCH   UNDDEPTH
UNDVOID UNDINFILT   SUCTION IMDMAX  MAXINFILT   DECAYCONS   DRYTIME MAXVOLUME
TBDBMP  2       1       0       2       0.35    0.3     0.15    0.6     1       0       1.5     0.4     1       0
        0       3       4       7       0
DW_6665 2       1       0       0       0.4     0.3     0.15    0       0       0       1       0.4     0.75    0
        0       3       4       7       0
DW_6671 2       1       0       0       0.4     0.3     0.15    0       0       0       1       0.4     0.75    0
        0       3       4       7       0
DW_6673 2       1       0       0       0.4     0.3     0.15    0       0       0       1       0.4     0.75    0
        0       3       4       7       0
DW_6674 2       1       0       0       0.4     0.3     0.15    0       0       0       1       0.4     0.75    0
        0       3       4       7       0
DW_6675 2       1       0       0       0.4     0.3     0.15    0       0       0       1       0.4     0.75    0
        0       3       4       7       0
DW_6684 2       1       0       0       0.4     0.3     0.15    0       0       0       1       0.4     0.75    0
        0       3       4       7       0
DW_6839 2       1       0       0       0.4     0.3     0.15    0       0       0       1       0.4     0.75    0
        0       3       4       7       0
DW_6844 2       1       0       0       0.4     0.3     0.15    0       0       0       1       0.4     0.75    0
        0       3       4       7       0
```

```
DW_6850 2       1       0       0       0.4     0.3     0.15    0       0       0       1       0.4     0.75    0
        0       3       4       7       0
DW_6856 2       1       0       0       0.4     0.3     0.15    0       0       0       1       0.4     0.75    0
        0       3       4       7       0
DW_6859 2       1       0       0       0.4     0.3     0.15    0       0       0       1       0.4     0.75    0
        0       3       4       7       0
DW_6861 2       1       0       0       0.4     0.3     0.15    0       0       0       1       0.4     0.75    0
        0       3       4       7       0
c---------------------------------------------------------------------------------------------------------------
-----------
c745 BMP Site HOLTAN GROWTH INDEX
c
c HOLTAN EQUATION:    F = GI * AVEG * (Computed Available Soil Storage)^ 1.4 + FINFILT
c
c BMPSITE = BMPSITE identifier in card 715
c GIi = 12 monthly values for GI in HOLTAN equation
c          Where i = jan, feb, mar...dec
c
c BMPSITE   jan feb mar apr may jun jul aug sep oct nov dec
TBDBMP  0       0       0       0       0       0       0       0       0       0       0       0
DW_6665 0       0       0       0       0       0       0       0       0       0       0       0
DW_6671 0       0       0       0       0       0       0       0       0       0       0       0
DW_6673 0       0       0       0       0       0       0       0       0       0       0       0
DW_6674 0       0       0       0       0       0       0       0       0       0       0       0
DW_6675 0       0       0       0       0       0       0       0       0       0       0       0
DW_6684 0       0       0       0       0       0       0       0       0       0       0       0
DW_6839 0       0       0       0       0       0       0       0       0       0       0       0
DW_6844 0       0       0       0       0       0       0       0       0       0       0       0
DW_6850 0       0       0       0       0       0       0       0       0       0       0       0
DW_6856 0       0       0       0       0       0       0       0       0       0       0       0
DW_6859 0       0       0       0       0       0       0       0       0       0       0       0
DW_6861 0       0       0       0       0       0       0       0       0       0       0       0
c---------------------------------------------------------------------------------------------------------------
-----------
c747 BMP Site Initial Moisture Content
c
c BMPSITE  = BMP Site identifier in card 715
c WATDEP_i = initial surface water depth (ft)
c THETA_i  = initial soil moisture (ft/ft)
c
c BMPSITE       WATDEP_i        THETA_i
TBDBMP  0       0.15
DW_6665 0       0.15
DW_6671 0       0.15
DW_6673 0       0.15
DW_6674 0       0.15
DW_6675 0       0.15
DW_6684 0       0.15
DW_6839 0       0.15
DW_6844 0       0.15
DW_6850 0       0.15
DW_6856 0       0.15
DW_6859 0       0.15
DW_6861 0       0.15
c---------------------------------------------------------------------------------------------------------------
-----------
c750 Class-C Conduit Parameters (required if BMPSITE is CLASS-C in card 715)
c
c BMPSITE     = BMP site identifier in card 715
c INLET_NODE  = BMP Id at the entrance of the conduit
c OUTLET_NODE = BMP Id at the exit of the conduit
c LENGTH      = Conduit length (ft)
c MANNING_N   = Manning's roughness coefficient
c INLET_IEL   = Invert Elevation at the entrance of the conduit (ft)
c OUTLET_IEL  = Invert Elevation at the exit of the conduit (ft)
c INIT_FLOW   = Initial flow in the conduit (cfs)
c INLET_HL    = Head loss coefficient at the entrance of the conduit
c OUTLET_HL   = Head loss coefficient at the exit of the conduit
c AVERAGE_HL  = Head loss coefficient along the length of the conduit
c
c BMPSITE       INLET_NODE      OUTLET_NODE     LENGTH  MANNING_N       INLET_IEL       OUTLET_IEL      INIT_FLOW
        INLET_HL        OUTLET_HL       AVERAGE_HL
c---------------------------------------------------------------------------------------------------------------
-----------
c755 Class C Conduit Cross Sections
c
c LINK    = BMP site identifier in card 715
c TYPE    = Conduit Type (rectangular, circular...)
c GEOM1   = Geometric cross-sectional property of the conduit
```

```
c GEOM2   = Geometric cross-sectional property of the conduit
c GEOM3   = Geometric cross-sectional property of the conduit
c GEOM4   = Geometric cross-sectional property of the conduit
c BARRELS = Number of Barrels in the conduit
c
c LINK  TYPE    GEOM1   GEOM2   GEOM3   GEOM4   BARRELS
c---------------------------------------------------------------------------------------------------------------
-----------
c760 Irregular Cross Sections
c
c Format of transect data follows:
c NC    nLeft   nRight  nChannel
c X1    name    nSta    xLeftBank       xRightBank      0       0       0       xFactor yFactor
c GR    Elevation       Station  ...
c---------------------------------------------------------------------------------------------------------------
-----------
c761 BufferStrip BMP Parameters (required if BMPTYPE is BUFFERSTRIP in card 715)
c
c BMPSITE   = BMP site identifier in card 715
c Width     = BMP width (ft)
c FLength   = Flow length (ft)
c DStorage  = Surface depression storage (in)
c SLOPE     = Overland slope (ft / ft)
c MANNING_N = Overland Manning's roughness coefficient
c POLREMM   = Pollutant Removal Method (0-1st order decay, 1-kadlec and knight method)
c ET_MULT   = Multiplier to PET
c
c BMPSITE       Width   FLength DStorage        SLOPE   MANNING_N       POLREMM ET_MULT
c---------------------------------------------------------------------------------------------------------------
-----------
c762 Area BMP Parameters (required if BMPTYPE is AREABMP in card 715)
c
c BMPSITE      = BMP site identifier in card 715
c Area         = BMP area (ft2)
c FLength      = flow length (ft) note: area width = area / flow length
c DStorage     = Surface depression storage (in)
c SLOPE        = Overland slope (ft / ft)
c MANNING_N    = Overland Manning's roughness coefficient
c SAT_INFILT   = Saturated infiltration rate (in/hr)
c POLREMM      = Pollutant Removal Method (0-1st order decay, 1-kadlec and knight method)
c DCIA         = Percentage of Directly Connected Impervious Area (0-100)
c TOTAL_IMP_DA = Total Impervious Drainage Area (acre)
c
c BMPSITE       Area    FLength DStorage        SLOPE   MANNING_N       SAT_INFILT      POLREMM DCIA    TOTAL_IMP_DA
c---------------------------------------------------------------------------------------------------------------
-----------
c765 BMP SITE Pollutant Decay/Loss rates
c
c BMPSITE    = BMP site identifier in card 715
c QUALDECAYi = First-order decay rate for pollutant i (hr^-1)
c              Where i = 1 to N (N = Number of QUAL from TIMESERIES FILES)
c
c BMPSITE       QUALDECAY1      QUALDECAY2 ... QUALDECAYN
TBDBMP  0.008333333    0.008333333    0.008333333    0.008333333    0.008333333    0.008333333    0.008333333
DW_6665 0.008333333    0.008333333    0.008333333    0.008333333    0.008333333    0.008333333    0.008333333
DW_6671 0.008333333    0.008333333    0.008333333    0.008333333    0.008333333    0.008333333    0.008333333
DW_6673 0.008333333    0.008333333    0.008333333    0.008333333    0.008333333    0.008333333    0.008333333
DW_6674 0.008333333    0.008333333    0.008333333    0.008333333    0.008333333    0.008333333    0.008333333
DW_6675 0.008333333    0.008333333    0.008333333    0.008333333    0.008333333    0.008333333    0.008333333
DW_6684 0.008333333    0.008333333    0.008333333    0.008333333    0.008333333    0.008333333    0.008333333
DW_6839 0.008333333    0.008333333    0.008333333    0.008333333    0.008333333    0.008333333    0.008333333
DW_6844 0.008333333    0.008333333    0.008333333    0.008333333    0.008333333    0.008333333    0.008333333
DW_6850 0.008333333    0.008333333    0.008333333    0.008333333    0.008333333    0.008333333    0.008333333
DW_6856 0.008333333    0.008333333    0.008333333    0.008333333    0.008333333    0.008333333    0.008333333
DW_6859 0.008333333    0.008333333    0.008333333    0.008333333    0.008333333    0.008333333    0.008333333
DW_6861 0.008333333    0.008333333    0.008333333    0.008333333    0.008333333    0.008333333    0.008333333
c---------------------------------------------------------------------------------------------------------------
-----------
c766 Pollutant K' values (applies when pollutant removal method is kadlec and knight method in card 740)
c
c BMPSITE = BMP site identifier in card 715
C QUALK'i = Constant rate for pollutant i (ft/yr)
c          Where i = 1 to N (N = Number of QUAL from card 705)
c
c BMPSITE       QUALK'1 QUALK'2 ... QUALK'N
c---------------------------------------------------------------------------------------------------------------
-----------
c767 Pollutant C* values (applies when pollutant removal method is kadlec and knight method in card 740)
c
```

```
c BMPSITE = BMP site identifier in card 715
c QUALC*i = Background concentration for pollutant i (mg/l)
c           Where i = 1 to N (N = Number of QUAL from card 705)
c
c BMPSITE      QUALC*1 QUALC*2 ... QUALC*N
c---------------------------------------------------------------------------------------------------------------
-----------
c768 Pollutant C values (applies when surface release type is 4 in card 725)
c
c BMPSITE = BMP site identifier in card 715
c QUALCi  = Constant surface release concentration for pollutant i (mg/l)
c           Where i = 1 to N (N = Number of QUAL from card 705)
c
c BMPSITE      QUALC1  QUALC2 ... QUALCN
TBDBMP  0       0       0       0       0       0       0
DW_6665 0       0       0       0       0       0       0
DW_6671 0       0       0       0       0       0       0
DW_6673 0       0       0       0       0       0       0
DW_6674 0       0       0       0       0       0       0
DW_6675 0       0       0       0       0       0       0
DW_6684 0       0       0       0       0       0       0
DW_6839 0       0       0       0       0       0       0
DW_6844 0       0       0       0       0       0       0
DW_6850 0       0       0       0       0       0       0
DW_6856 0       0       0       0       0       0       0
DW_6859 0       0       0       0       0       0       0
DW_6861 0       0       0       0       0       0       0
c---------------------------------------------------------------------------------------------------------------
-----------
c770 BMP Underdrain Pollutant Percent Removal (applies when underdrain option is "1" in card 740)
c
c BMPSITE     = BMPSITE identifier in card 715
c QUALPCTREMi = Perecent Removal for pollutant i through underdrain (0-1)
c               Where i = 1 to N (N = Number of QUAL from TIMESERIES FILES)
c
c BMPSITE      QUALPCTREM1    QUALPCTREM2 ... QUALPCTREMN
TBDBMP  0       0       0       0       0       0       0
DW_6665 0       0       0       0       0       0       0
DW_6671 0       0       0       0       0       0       0
DW_6673 0       0       0       0       0       0       0
DW_6674 0       0       0       0       0       0       0
DW_6675 0       0       0       0       0       0       0
DW_6684 0       0       0       0       0       0       0
DW_6839 0       0       0       0       0       0       0
DW_6844 0       0       0       0       0       0       0
DW_6850 0       0       0       0       0       0       0
DW_6856 0       0       0       0       0       0       0
DW_6859 0       0       0       0       0       0       0
DW_6861 0       0       0       0       0       0       0
c---------------------------------------------------------------------------------------------------------------
-----------
c771 BMP Underdrain Pollutant Effluent Concentration (applies when underdrain option is "2" in card 740)
c
c BMPSITE     = BMPSITE identifier in card 715
c QUALEFFCi   = Underdrain effluent concentration for pollutant i (mg/l)
c               Where i = 1 to N (N = Number of QUAL from TIMESERIES FILES)
c
c BMPSITE      QUALEFFC1      QUALEFFC2 ... QUALEFFCN
TBDBMP  0       0       0       0       0       0       0
DW_6665 0       0       0       0       0       0       0
DW_6671 0       0       0       0       0       0       0
DW_6673 0       0       0       0       0       0       0
DW_6674 0       0       0       0       0       0       0
DW_6675 0       0       0       0       0       0       0
DW_6684 0       0       0       0       0       0       0
DW_6839 0       0       0       0       0       0       0
DW_6844 0       0       0       0       0       0       0
DW_6850 0       0       0       0       0       0       0
DW_6856 0       0       0       0       0       0       0
DW_6859 0       0       0       0       0       0       0
DW_6861 0       0       0       0       0       0       0
c---------------------------------------------------------------------------------------------------------------
-----------
c775 Sediment General Parameters (required if pollutant type is sediment in card 705)
c
c BMPSITE = BMP site identifier in card 715
c BEDWID  = Bed width (ft) - this is constant for the entire simulation period
c BEDDEP  = Initial bed depth (ft)
c BEDPOR  = Bed sediment porosity
```

```
c
c BMPSITE      BEDWID  BEDDEP  BEDPOR
c---------------------------------------------------------------------------------------------------------------
-----------
c780 Sand Transport Parameters (required if pollutant type is sediment in card 705)
c
c BMPSITE = BMP site identifier in card 715
c D       = Effective diameter of the transported sand particles (in)
c W       = The corresponding fall velocity in still water (in/sec)
c RHO     = The density of the sand particles (lb/ft3)
c KSAND   = The coefficient in the sandload power function formula
c EXPSND  = The exponent in the sandload power function formula
c
c BMPSITE      D       W       RHO     KSAND   EXPSND
c---------------------------------------------------------------------------------------------------------------
-----------
c785 Silt Transport Parameters (required if pollutant type is sediment in card 705)
c
c BMPSITE = BMP site identifier in card 715
c D       = Effective diameter of the transported silt particles (in)
c W       = The corresponding fall velocity in still water (in/sec)
c RHO     = The density of the silt particles (lb/ft3)
c TAUCD   = The critical bed shear stress for deposition (lb/ft2)
c TAUCS   = The critical bed shear stress for scour (lb/ft2)
c M       = The erodibility coefficient of the silt particles (lb/ft2/day)
c
c BMPSITE      D       W       RHO     TAUCD   TAUCS   M
c---------------------------------------------------------------------------------------------------------------
-----------
c786 Clay Transport Parameters (required if pollutant type is sediment in card 705)
c
c BMPSITE = BMP site identifier in card 715
c D       = Effective diameter of the transported clay particles (in)
c W       = The corresponding fall velocity in still water (in/sec)
c RHO     = The density of the silt/clay particles (lb/ft3)
c TAUCD   = The critical bed shear stress for deposition (lb/ft2)
c TAUCS   = The critical bed shear stress for scour (lb/ft2)
c M       = The erodibility coefficient of the clay particles (lb/ft2/day)
c
c BMPSITE      D       W       RHO     TAUCD   TAUCS   M
c---------------------------------------------------------------------------------------------------------------
-----------
c790 LAND TO BMP ROUTING NETWORK
c
c UniqueID = Identifies an instance of LANDTYPE in SCHEMATIC
c LANDTYPE = Corresponds to LANDTYPE in c710
c AREA     = Area of LANDTYPE in ACRES
c DS       = UNIQUE ID of DS BMP (0 - no BMP, add to end)
c LCGID    = Land Control Group Identifier in card 711 (0 - no change)
c
c UniqueID     LANDTYPE       AREA    DS      LCGID
c---------------------------------------------------------------------------------------------------------------
-----------
c795 BMP Site ROUTING NETWORK
c
c BMPSITE     = BMPSITE identifier in card 715
c OUTLET_TYPE = Outlet type (1-total, 2-weir, 3-orifice or channel, 4-underdrain, 5-untreated)
c DS          = Downstrem BMP site identifier in card 715 (0 - no BMP, add to end)
c
c BMPSITE      OUTLET_TYPE    DS
ut      1       out
out     1       0
TBDBMP  1       out
sewer   1       out
DW_6665 2       ut
DW_6671 2       ut
DW_6673 2       ut
DW_6674 2       ut
DW_6675 2       ut
DW_6684 2       ut
DW_6839 2       ut
DW_6844 2       ut
DW_6850 2       ut
DW_6856 2       ut
DW_6859 2       ut
DW_6861 2       ut
DW_6665 3       sewer
DW_6665 4       sewer
DW_6665 5       out
```

```
DW_6671 3       sewer
DW_6671 4       sewer
DW_6671 5       out
DW_6673 3       sewer
DW_6673 4       sewer
DW_6673 5       out
DW_6674 3       sewer
DW_6674 4       sewer
DW_6674 5       out
DW_6675 3       sewer
DW_6675 4       sewer
DW_6675 5       out
DW_6684 3       sewer
DW_6684 4       sewer
DW_6684 5       out
DW_6839 3       sewer
DW_6839 4       sewer
DW_6839 5       out
DW_6844 3       sewer
DW_6844 4       sewer
DW_6844 5       out
DW_6850 3       sewer
DW_6850 4       sewer
DW_6850 5       out
DW_6856 3       sewer
DW_6856 4       sewer
DW_6856 5       out
DW_6859 3       sewer
DW_6859 4       sewer
DW_6859 5       out
DW_6861 3       sewer
DW_6861 4       sewer
DW_6861 5       out
c-------------------------------------------------------------------------------------------------------------------
-----------
c800 Optimization Controls
c
c Technique -- Optimization Techniques
c     0 = no optimization
c     2 = NSGAII
c Option -- Optimization options
c     0 = no optimization
c     1 = specific control target and minimize cost
c     2 = generate cost effectiveness curve
c StopDelta -- Criteria for stopping the optimization iteration
c             in dollars($), meaning if the cost not improved by this criteria, stop the search (for Option 1)
c MaxRuns -- Maximum number of iterations (should be greater than 4times the number of decision variables in
card 711 and 810)
c NumBest -- Number of best solutions for output (for Option 1)
c
c Technique    Option  StopDelta      MaxRuns NumBest
0       2       0       10000   1
c-------------------------------------------------------------------------------------------------------------------
-----------
c805 BMP Cost Functions
c Cost ($) = ((LinearCost)*Length^(LengthExp) + (AreaCost)*Area^(AreaExp) +
(TotalVolumeCost)*TotalVolume^(TotalVolExp)
c          + (MediaVolumeCost)*SoilMediaVolume^(MediaVolExp) +
(UnderDrainVolumeCost)*UnderDrainVolume^(UDVolExp)
c          + (ConstantCost)) * (1+PercentCost/100)
c
c BMPSITE              = BMP site identifier in card 715
c LinearCost           = Cost per unit length of the BMP structure ($/ft)
c AreaCost             = Cost per unit area of the BMP structure ($/ft^2)
c TotalVolumeCost      = Cost per unit total volume of the BMP structure ($/ft^3)
c MediaVolumeCost      = Cost per unit volume of the soil media ($/ft^3)
c UnderDrainVolumeCost = Cost per unit volume of the under drain structure ($/ft^3)
c ConstantCost         = Constant cost ($)
c PercentCost          = Cost in percentage of all other cost (%)
c LengthExp            = Exponent for linear unit
c AreaExp              = Exponent for area unit
c TotalVolExp          = Exponent for total volume unit
c MediaVolExp          = Exponent for soil media volume unit
c UDVolExp             = Exponent for underdrain volume unit
c
c BMPSITE      LinearCost     AreaCost       TotalVolumeCost        MediaVolumeCost        UnderDrainVolumeCost
       ConstantCost   PercentCost    LengthExp      AreaExp TotalVolExp    MediaVolExp    UDVolExp
TBDBMP  0       0       0       0       0       0       0       1       1       1       1       1
DW_6665 0       0       12.6    0       0       120000  0       1       1       1       1       1
```

```
DW_6671 0       0       12.6    0       0       120000  0       1       1       1       1       1
DW_6673 0       0       12.6    0       0       120000  0       1       1       1       1       1
DW_6674 0       0       12.6    0       0       120000  0       1       1       1       1       1
DW_6675 0       0       12.6    0       0       120000  0       1       1       1       1       1
DW_6684 0       0       12.6    0       0       120000  0       1       1       1       1       1
DW_6839 0       0       12.6    0       0       120000  0       1       1       1       1       1
DW_6844 0       0       12.6    0       0       120000  0       1       1       1       1       1
DW_6850 0       0       12.6    0       0       120000  0       1       1       1       1       1
DW_6856 0       0       12.6    0       0       120000  0       1       1       1       1       1
DW_6859 0       0       12.6    0       0       120000  0       1       1       1       1       1
DW_6861 0       0       12.6    0       0       120000  0       1       1       1       1       1
c---------------------------------------------------------------------------------------------------------------
-----------
c806 Diversion Structure Cost Function
c Cost ($) = ((DiversionCost)*DIV_RATE^(DiversionExp) + (ConstantCost)) * (1+PercentCost/100)
c
c BMPSITE               = BMP site identifier in card 715
c DiversionCost         = Cost per unit diversion rate ($/cfs)
c DiversionExp          = Exponent for diversion rate
c ConstantCost          = Constant cost ($)
c PercentCost           = Cost in percentage of all other cost (%)
c
c BMPSITE       DiversionCost  DiversionExp   ConstantCost   PercentCost
TBDBMP  0       1       0       0
DW_6665 25400   1       0       0
DW_6671 25400   1       0       0
DW_6673 25400   1       0       0
DW_6674 25400   1       0       0
DW_6675 25400   1       0       0
DW_6684 25400   1       0       0
DW_6839 25400   1       0       0
DW_6844 25400   1       0       0
DW_6850 25400   1       0       0
DW_6856 25400   1       0       0
DW_6859 25400   1       0       0
DW_6861 25400   1       0       0
c---------------------------------------------------------------------------------------------------------------
-----------
c810 BMP SITE Adjustable Parameters
c
c BMPSITE  = BMP site identifier in card 715
c VARIABLE = Variable name (must use the exact same keyword)
c            LENGTH --- BMP length,
c            NUMUNIT --- number of units,
c            WEIRH --- weir height,
c            SDEPTH --- soil media depth,
c            DCIA --- directly connected impervious area for area BMP type,
c            MAXDEPTH --- maximum surface storage depth for swale,
c            CECURVE --- cost-effectiveness curve for Tier-1 solution
c            DIV_RATE --- maximum flow diversion rate into BMP
c FROM     = From value in the range
c TO       = To value in the range
c STEP     = Increment step
c
c BMPSITE       VARIABLE       FROM    TO      STEP
TBDBMP  LENGTH  0       0       0
DW_6665 LENGTH  0       10      0.05
DW_6671 LENGTH  0       10      0.05
DW_6673 LENGTH  0       10      0.05
DW_6674 LENGTH  0       10      0.05
DW_6675 LENGTH  0       10      0.05
DW_6684 LENGTH  0       10      0.05
DW_6839 LENGTH  0       10      0.05
DW_6844 LENGTH  0       10      0.05
DW_6850 LENGTH  0       10      0.05
DW_6856 LENGTH  0       10      0.05
DW_6859 LENGTH  0       10      0.05
DW_6861 LENGTH  0       10      0.05
c---------------------------------------------------------------------------------------------------------------
-----------
c814 Predeveloped Timeseries at Assessment Point for Flow Duration Curve
c
c BMPSITE    = BMP site identifier in card 715 if it is an assessment point
c NumBins    = Number of bins for flow duration curve
c PreDevFlag = Pre-developed timeseries option (1-internal,2-external)
c PreDevFile = Pre-developed timeseries file path for external option
c              The timeseries file format (AssessmentPoint_ID      Year    Month   Day     Hour    Minute
       Flow_cfs)
```

```
c              The first line is skipped (comment line) and data start from the second line in the required
format.
c
c BMPSITE      NumBins PreDevFlag     PreDevFile
c-----------------------------------------------------------------------------------------------------------
-----------
c815 Assessment Point and Evaluation Factor
c
c BMPSITE -- BMP site identifier in card 715 if it is an assessment point
c FactorGroup -- Flow or pollutant related evaluation factor group
c    -1 = flow related evaluation factor
c     # = pollutant ID in card 705
c FactorType -- Evaluation Factor Type (negative number for flow related and positive number for pollutant
related)
c    -1 = AAFV Annual Average Flow Volume (ft3/yr)
c    -2 = PDF  Peak Discharge Flow (cfs)
c    -3 = FEF  Flow Exceeding frequency  (#times/year)
c    -4 = FDC  Flow Duration Curve (sum of sorted flow difference with pre-developed condition, cfs)
c     1 = AAL  Annual Average Load (lb/yr)
c     2 = AAC  Annual Average Concentration (mg/L)
c     3 = MAC  Maximum #days Average Concentraion (mg/L)
c FactorVal1 -- if FactorType = 3 (MAC): Maximum #Days;
c            -- if FactorType = -3 (FEF): Threshold (cfs)
c            -- if FactorType = -4 (FDC): Low flow limit (cfs)
c            -- all other FactorType : -99
c FactorVal2 -- if FactorType = -3 (FEF): Minimum inter-exceedance time (hr)
c                                         if =  0 then daily running average flow exceeding frequency
c                                         if = -1 then daily average flow exceeding frequency
c                                         otherwise minimum inter-exceedance time for simulation interval
c            -- if FactorType = -4 (FDC): High flow limit (cfs)
c            -- all other FactorType : -99
c CalcMode -- Evaluation Factor Calculation Mode
c   -99 for Option 0 (card 800): no optimizaiton
c     1 = % percent of value under existing condition (0-100)
c     2 = S scale between pre-develop and existing condition (0-1)
c     3 = V  absolute value in the unit as shown in FactorType (third block in this card)
c TargetVal1 -- Target value for evaluation factor calculation mode
c     -99 for Option 0 (card 800): no optimizaiton
c     Target value for minimize cost Option 1 (card 800)
c     Lower limit of target value for cost-effective curve Option 2 (card 800)
c TargetVal2 -- Target value for evaluation factor calculation mode
c     -99 for Option 0 (card 800): no optimizaiton
c     -99 for Option 1 (card 800): minimize cost
c     Upper limit of target value for cost-effective curve Option 2 (card 800)
c Factor_Name -- Evaluation factor name (user specified without any space), e.g. FlowVolume or SEDIMENT
c
c BMPSITE      FactorGroup    FactorType     FactorVal1     FactorVal2     CalcMode       TargetVal1
       TargetVal2     FactorName
out     7       1       -99     -99     1       0       100     PLS_TZn
ut      7       1       -99     -99     1       0       100     PLS_TZn
TBDBMP  7       1       -99     -99     1       0       100     PLS_TZn
DW_6665 7       1       -99     -99     1       0       100     PLS_TZn
DW_6671 7       1       -99     -99     1       0       100     PLS_TZn
DW_6673 7       1       -99     -99     1       0       100     PLS_TZn
DW_6674 7       1       -99     -99     1       0       100     PLS_TZn
DW_6675 7       1       -99     -99     1       0       100     PLS_TZn
DW_6684 7       1       -99     -99     1       0       100     PLS_TZn
DW_6839 7       1       -99     -99     1       0       100     PLS_TZn
DW_6844 7       1       -99     -99     1       0       100     PLS_TZn
DW_6850 7       1       -99     -99     1       0       100     PLS_TZn
DW_6856 7       1       -99     -99     1       0       100     PLS_TZn
DW_6859 7       1       -99     -99     1       0       100     PLS_TZn
DW_6861 7       1       -99     -99     1       0       100     PLS_TZn
sewer   7       1       -99     -99     1       0       100     PLS_TZn
```

# ATTACHMENTS FOR SECTION 3.4:

## LONG-TERM PERFORMANCE

# Proposed Condition Long-Term Hydrologic Modeling

## Metro Orange Line Water Infiltration and Quality Project

# 1. INTRODUCTION

As part of the Safe Clean Water Program Feasibility Study for the Metro Orange Line Water Infiltration and Quality Project ("Project"), this attachment documents the methodology and modeling results that support the quantified water quality and water supply benefits presented in the main report.

Given the nature of the proposed distributed infiltration BMPs, the Safe Clean Water project module's built-in modeling component cannot be utilized. Instead, the modeling work was performed using Los Angeles County's Watershed Management System 2.0 (WMMS 2.0). Detailed model development methodology is presented below.

# 2. MODEL DEVELOPMENT

WMMS 2.0 is the latest watershed modeling system that developed by Los Angeles Flood Control District. It is released to the public in May 2020. WMMS 2.0 is a thorough upgrade to WMMS 1.0 that was released in August 2013. In comparison to the previous version, WMMS 2.0 is calibrated based on hydrology and water quality monitoring data collected up to 2018 and hence can more accurately simulate contaminant loading, runoff volume, and flow rate associated with various design storms and long-term simulation for all major watershed within Los Angeles County. WMMS 2.0 contains two major components: a Loading Simulation Program in C++ (LSPC), which is a watershed modelling system to simulate runoff and pollutant loading; and a System for Urban Stormwater Treatment and Analysis Integration (SUSTAIN), which utilizes LSPC model output and evaluates BMP performance in terms of pollutant load reduction and runoff volume reduction

The hydrology analysis included the development of a 10-year continuous simulation model between 10/1/2008 and 9/30/2018 and a 24-Hour, 85th Percentile simulations. Although the September 2019 Feasibility Study Guidelines state that a minimum of 20-years should be used for the annual average calculations, LA County staff have since requested that the modeling period match that of the online module which is 10/1/2008 – 09/30/2018

For the WMMS 2.0 model, the baseline LSPC model was modified by editing the subwatershed boundary and hydrologic response unit (HRU) parameters to simulate dry and wet weather runoff from the Project drainage areas[1]. The hydrologic response unit (HRU) within the revised subwatershed boundary was updated accordingly using the HRU raster downloaded from WMMS 2.0 website. A SUSTAIN model[2] was then developed to determine the design-storm and average annual stormwater capture volumes for a range of BMP configurations. This section describes the inputs used, the proposed sizing scenario and the results. It is assumed that the

---

[1] Model input was developed and executed using LSPC v6.0 provided in the WMMS 2.0 application package.

[2] Model input was developed and executed using SUSTAIN v2.1 provided in the WMM S 2.0 application package.

baseline LSPC model has been calibrated by LACFCD to reflect the hydrologic condition within each watershed in Los Angeles County. Default parameters were used unless site-specific modification was required (e.g. subwatershed boundary).

The remainder of the section focuses on describing the long-term simulation development of the WMMS 2.0 model.

# 3. ASSUMPTIONS AND APPROACH

The WMMS 2.0 input parameters assumed for each scenario included:

- **Precipitation and Model Run Time:** Taken directly from the baseline WMMS 2.0 database, the default rain gauges assigned to LSPC subwatersheds 6839, 6844, 6850, 6856, 6859 and 6861 and model run time (10/1/2008 – 09/30/2018) were used for the simulation. to be consistent with the recommended modeling period specified in the SCW online module. The 10-year hyetographs for the selected rain gauges are shown in Figure 1.

- **Dry-weather Runoff Estimate:** The LSPC model simulation estimated the dry weather runoff as a function of irrigated pervious HRU. This was updated for the updated Project drainage area described above.

- **Soils:** Taken directly from the baseline WMMS model, the default WMMS soil parameters adopted from LSPC subwatersheds 6839, 6844, 6850, 6856, 6859 and 6861were used in the simulation.

- **Routing:** Stormwater and dry weather runoff routing as illustrated in Figure 2 was set up in the SUSTAIN model to evaluate the proposed BMP configuration and dimensions. Consistent with the drywell cluster drainage areas shown in Figure 3, a total of seven[3] 10-year LSPC hydrographs were included in the SUSTAIN model. During the simulation, bypass from any BMP cluster is considered overall bypass is not routed to any downstream BMP.

---

[3] One hydrograph per LSPC subwatershed listed above. In addition, two of the proposed infiltration BMPs receive runoff from each of two distinct sub-drainages within subwatershed 6844. To distinguish the hydrographs, one of the hydrographs was labeled as 6665.

# 4. RESULTS

This section summarizes the modeling output. All model input and output files are provided in Appendix A.

Key inputs and results from the WMMS model are summarized below in Table 1 for the 10-year long-term continuous simulation model. The results were aggregated from all the drainage area and organized in accordance with the input required specified in the SCW Project Module.

**Table 1. Summary of WMMS Model Inputs and Results (10-Year Model Run)**

| **Key Modeling Input** | |
|---|---|
| 10-Year Rainfall Total (10/2008 – 9/2018) (inches) | 115[4] |
| Average Annual Rainfall (inches) | 11.5 |
| Total Number of Drywells Modeled | 168 |
| Infiltration Capacity per Drywell (cfs) | 0.8 |
| **Key Modeling Output** | |
| Average Stormwater Inflow Rate (cfs) | 98.4 |
| Average Dry Weather Inflow Rate (cfs) | 0.1 |
| 10-Year Total Stormwater Runoff Volume (ac-ft) | 13,500 |
| Average Annual Stormwater Runoff Volume (ac-ft/year) | 1,350 |
| 10-Year Runoff Volume Captured (ac-ft) | 8,900 |
| Average Annual Runoff Capture (ac-ft/year) | 890 |
| Average Capture Percentage | 65% |

Since the infiltration BMPs achieve pollutant reduction via runoff volume reduction, the average capture percentage is assumed equivalent to the pollutant removal efficiency of all modeled pollutants.

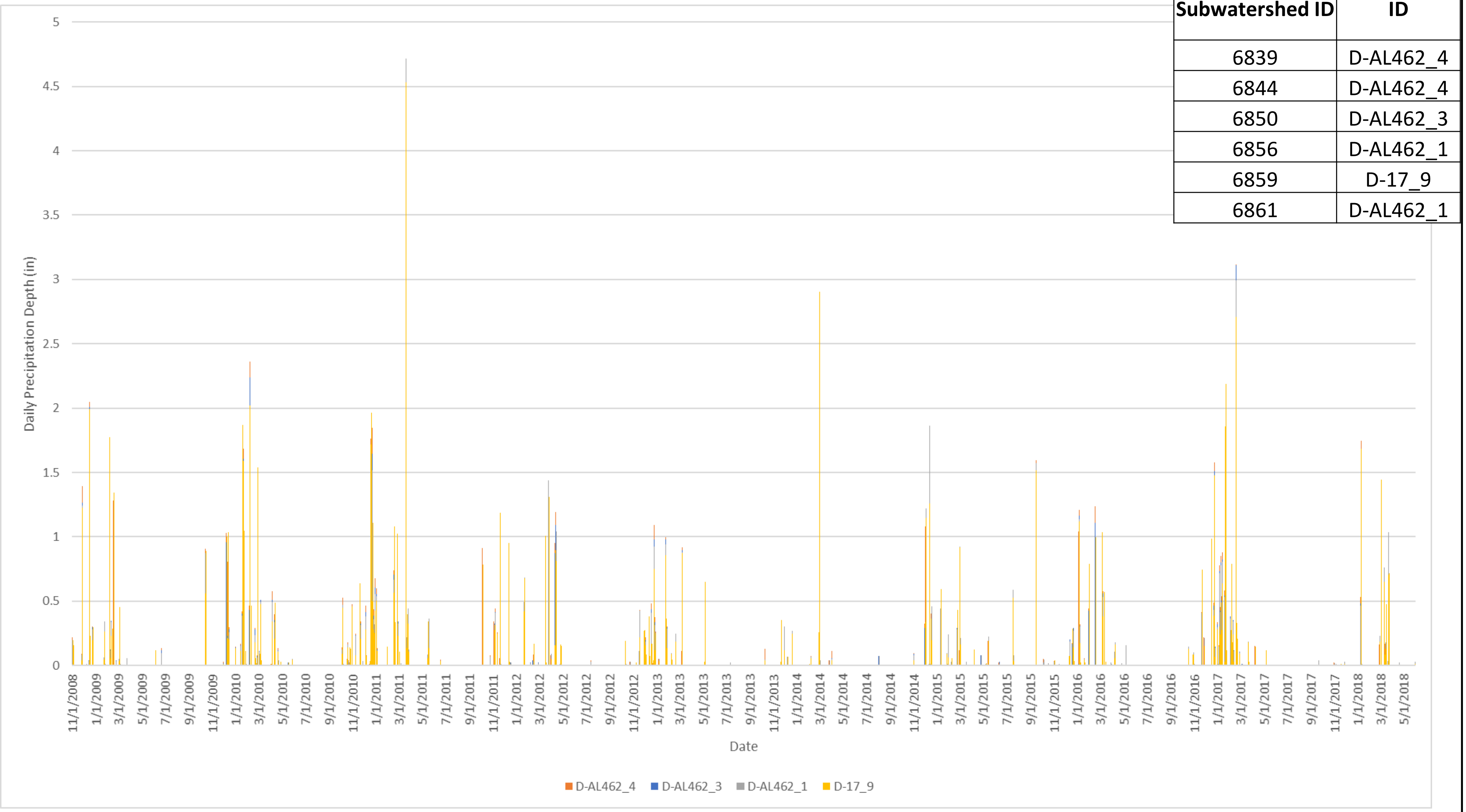
In summary, on an annual basis, based on the long-term simulation, the proposed Project is projected to capture and recharge 890 acre-feet of stormwater and dry weather runoff and achieve a 65% pollutant load reduction.

---

[4] Average value of all rain gauges used in the model

# FIGURES

| LSPC Subwatershed ID | Rain Gauge ID |
|---|---|
| 6839 | D-AL462_4 |
| 6844 | D-AL462_4 |
| 6850 | D-AL462_3 |
| 6856 | D-AL462_1 |
| 6859 | D-17_9 |
| 6861 | D-AL462_1 |



**10-Year Hyetograph**

**Metro Orange Line Water Infiltration and Quality Project –**
**Exiting Hydrology and Water Quality Condition**
Los Angeles, CA

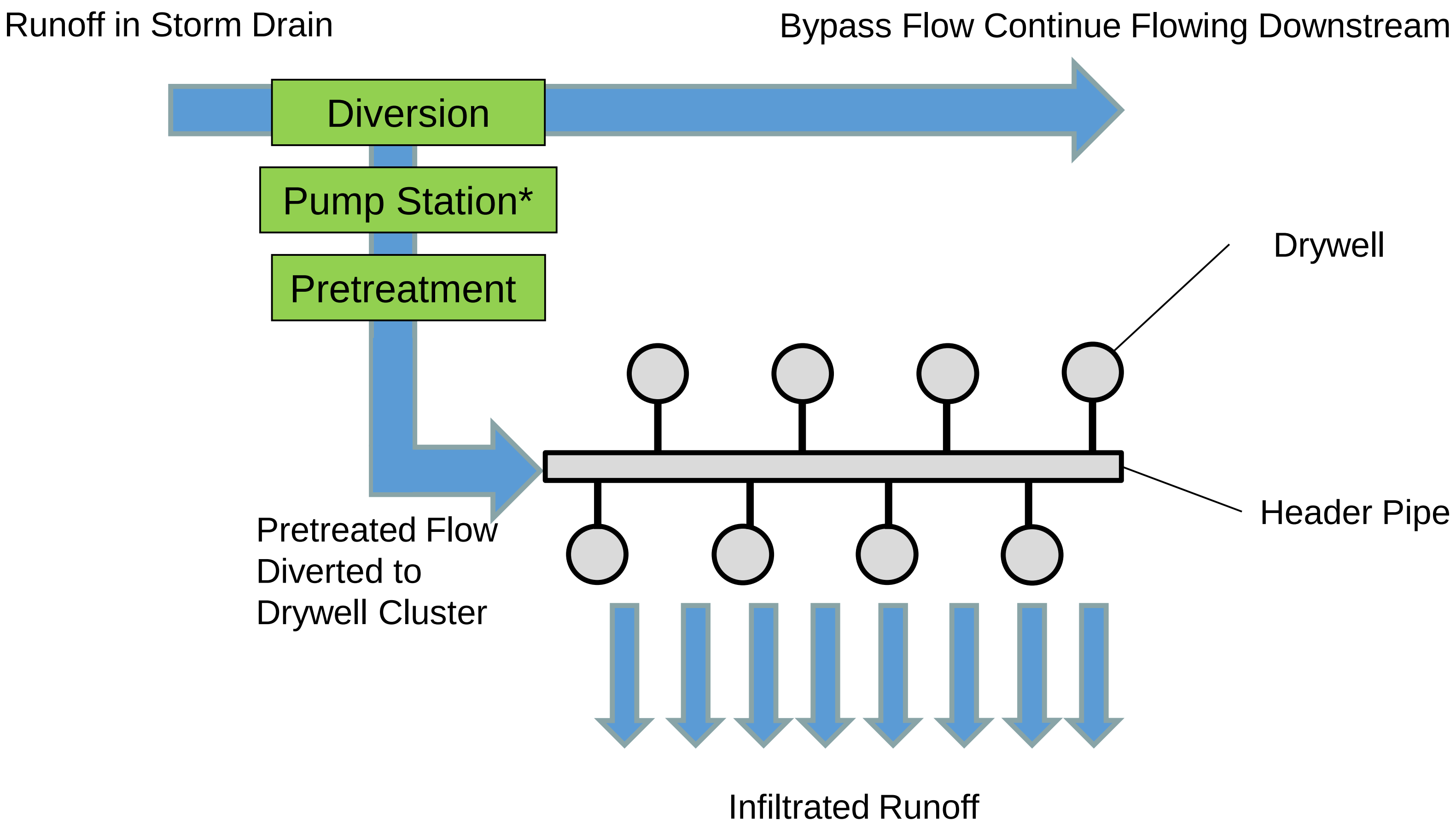
Geosyntec
consultants

Los Angeles

October 2020

**Figure**

**1**



Runoff in Storm Drain

Bypass Flow Continue Flowing Downstream

Diversion

Pump Station*

Pretreatment

Drywell

Header Pipe

Pretreated Flow
Diverted to
Drywell Cluster

Infiltrated Runoff

* Not applicable to Site MOL-6

**Simplified Routing Network**

**Metro Orange Line Water Infiltration and Quality Project –**
**Event-based Hydrologic Modeling**
Los Angeles, CA

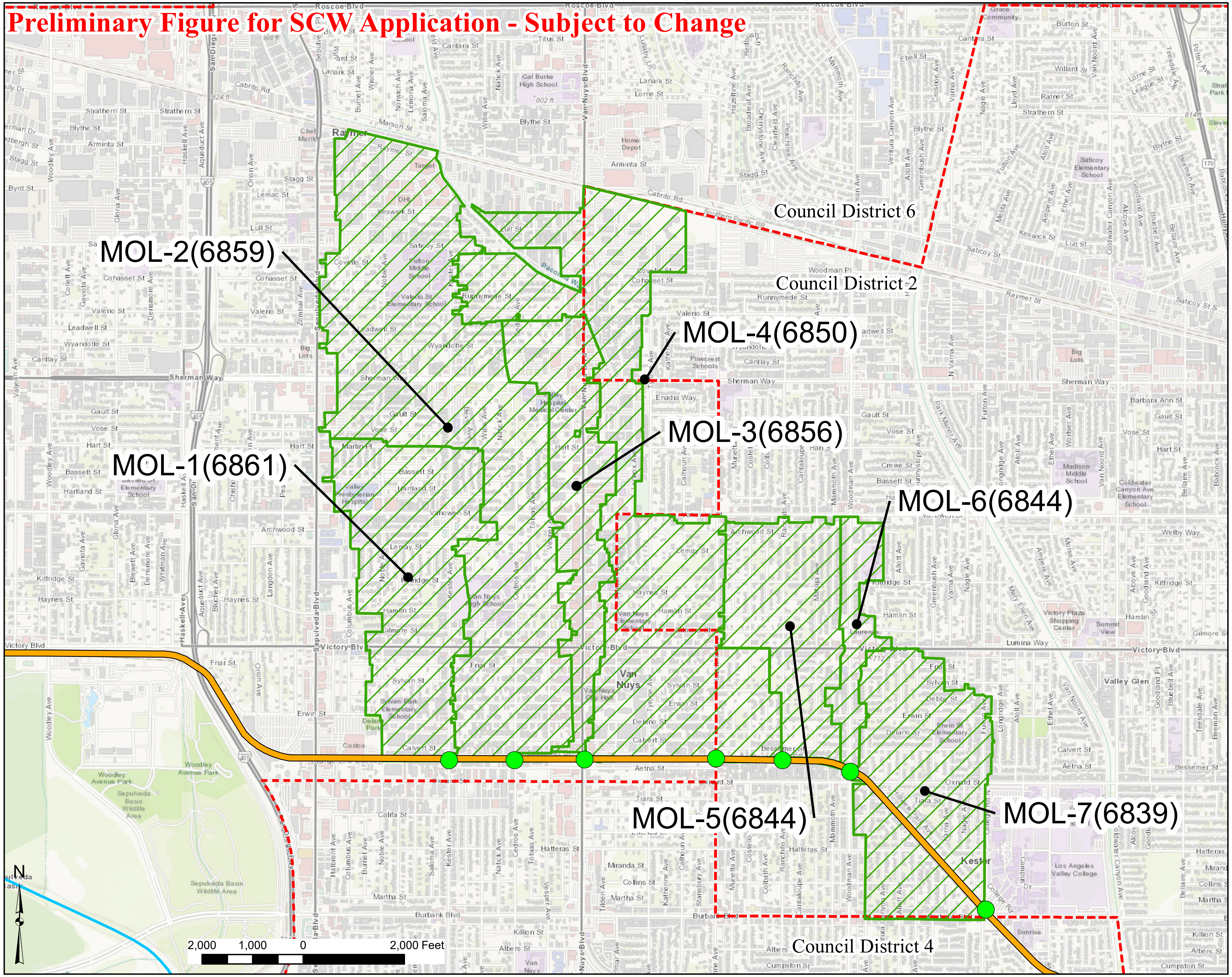
Geosyntec
consultants

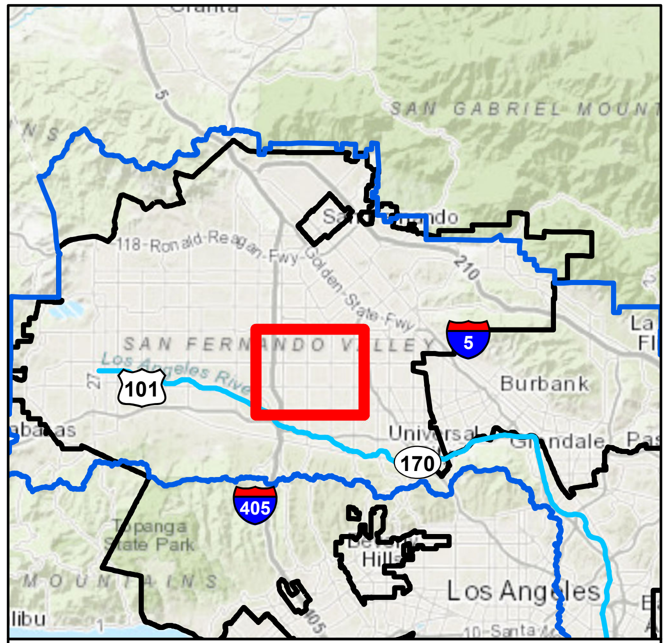
**Figure**

**2**

| | |
|---|---|
| Los Angeles | October 2020 |

"\\WESTLA-01\Data\Project Folders\City of LA BOS On-Call\LA0565 - TOS 68 97 98 99\Feasibility Studies\Draft Feasibility Studies\Sun Valley - Valley Village\Attachment C - Hydrology Review\Figures\Fig 04_Routing.ppt"





- 🟢 Proposed Drywell Clusters
- 🟧 Metro Orange Line
- Los Angeles River
- ▨ Drywell Cluster Drainage Area
- 🟦 Upper LA River Watershed (ULAR)
- ⬛ Los Angeles City Boundary
- 🟥 City Council District Boundary

1. LSPC Watershed IDs labeled.WMMS 2 Database (LA County Public Works), 2020

## Catchment Area with LSPC Subwatershed

**Metro Orange Line Water Infiltration and Quality Project - Hydrology Report**

Los Angeles, CA

Geosyntec consultants

Los Angeles | October 2020

**Figure 3**

P:\GIS\Metro FS LA0583005\Project\H&H\Fig 03_Catchment.mxd

# APPENDIX A

## WMMS 2.0 LSPC and Sustain Model

*Output not included as it contains 10,000+ lines of times series output. Output can be provided as electronic copy upon request

# LSPC Model Input

(Please see Appendix A of the Hydrology PDF uploaded to “Design Elements -> Site Condition & Constraints” section of this application

# SUSTAIN Model Input

```
c---------------------------------------------------------------------------------------------------------------
-----------
c
c SUSTAIN: System for Urban Stormwater Treatment and Analysis INtegration
c Version 2.1 - Jan 2020
c
c Created through code updates by:
c Paradigm Environmental, Inc.
c San Diego, California, USA
c www.paradigmh2o.com
c
c Based upon SUSTAIN version 1.2 (Apr 2014), originally developed by:
c United States Environmental Protection Agency
c Office of Research & Development
c with support by Tetra Tech, Inc.
c https://www.epa.gov/water-research/system-urban-stormwater-treatment-and-analysis-integration-sustain
c
c NOTE: The line starting with the letter c and followed by space or - is a comment line.
c       There must be no comment line in between the data lines
c       The input text field must be a continuous string without any space in between the characters
c
c---------------------------------------------------------------------------------------------------------------
-----------
c700 Model Controls
c
c LINE1 = Land simulation control (0-external),
c         Land output directory path (containing unit-area land output timeseries)
c         Note: external land timeseries data must be in this order;
c               flow (in./timestep),
c               groundwater recharge (in./timestep),
c               pollutant 1 (lb/acre/timestep),
c               pollutant2, ...
c LINE2 = Start date of simulation (Year Month Day)
c LINE3 = End date of simulation (Year Month Day)
c LINE4 = Land Timeseries timestep (Minute),
c         BMP simulation timestep (Minute),
c         CRRAT = The ratio of max velocity to mean velocity under typical flow conditions (value of 1.0 or
greater),
c         Model output control (0-same timestep as land time series; 1-hourly),
c         Model output directory path
c LINE5 = PET Flag (0-constant monthly PET, 1-PET from the timeseries (in/timestep as land time series),
c         PET time series file path (required if PET flag is 1)
c LINE6 = Monthly PET rate (in/day) if PET flag is 0   OR
c         Monthly PET coefficient (multiplier to PET value) if PET flag is 1
c
0       C:\SUSTAIN_X64\LA0583005\Timeseries\10-Year\SURO
2008    10     1
2018    9      30
60      5      1.5    1      C:\SUSTAIN_X64\LA0583005\Output\10-Year\SURO
0
0.0632  0.0798  0.1174  0.1507  0.1626  0.1787  0.1897  0.1855  0.1547  0.1047  0.0715  0.0531
c---------------------------------------------------------------------------------------------------------------
-----------
c705 Pollutant Definition
c
c POLLUT_ID   = Unique pollutant identifier (Sequence number same as in land output time series)
c POLLUT_NAME = Unique pollutant name
c MULTIPLIER  = Multiplying factor used to convert the pollutant load to lbs (external control)
c SED_FLAG    = The sediment flag (0-not sediment,1-sand,2-silt,3-clay,4-total sediment)
c               if = 4 SEDIMENT will be splitted into sand, silt,and clay based on the fractions defined in card
710.
c SED_QUAL    = The sediment-associated pollutant flag (0-no, 1-yes)
c               if = 1 then SEDIMENT is required in the pollutant list
c SAND_QFRAC  = The sediment-associated qual-fraction on sand (0-1), only required if SED_QUAL = 1
c SILT_QFRAC  = The sediment-associated qual-fraction on silt (0-1), only required if SED_QUAL = 1
c CLAY_QFRAC  = The sediment-associated qual-fraction on clay (0-1), only required if SED_QUAL = 1
c
c POLLUT_ID    POLLUT_NAME    MULTIPLIER     SED_FLAG       SED_QUAL       SAND_QFRAC     SILT_QFRAC
       CLAY_QFRAC
```

```
1       TSS     2240    0       0       0       0       0
2       TN      1       0       0       0       0       0
3       TP      1       0       0       0       0       0
4       TCD     1       0       0       0       0       0
5       TCU     1       0       0       0       0       0
6       TPB     1       0       0       0       0       0
7       TZN     1       0       0       0       0       0
c---------------------------------------------------------------------------------------------------------------
-----------
c710 LAND USE DEFINITION (required if land simulation control is external)
c
c LANDTYPE       = Unique land use definition identifier
c LANDNAME       = land use name
c IMPERVIOUS     = Distinguishes pervious/impervious land unit (0-pervious; 1-impervious)
c TIMESERIESFILE = File name containing input timeseries
c SAND_FRAC      = The fraction of total sediment from the land which is sand (0-1)
c SILT_FRAC      = The fraction of total sediment from the land which is silt (0-1)
c CLAY_FRAC      = The fraction of total sediment from the land which is clay (0-1)
c
c LANDTYPE     LANDNAME       IMPERVIOUS     TIMESERIESFILE SAND_FRAC      SILT_FRAC      CLAY_FRAC
1       Road_Freeway-All-All-All      1       1000_Road_Freeway-All-All-All.txt     0       0.55    0.4
c---------------------------------------------------------------------------------------------------------------
-----------
c712 Aquifer INFORMATION
c
c AquiferID       = Unique Aquifer identifier
c AquiferNAME     = Aquifer name
c Initial Storage = Initial Storage (ac-ft)
c RecessionCoef   = Recession Coefficient (1/hr)
c SeepageCoef     = Seepage Coefficient (1/hr)
c
c AquiferID    AquiferNAME    InitialStorage RecessionCoef  SeepageCoef
c---------------------------------------------------------------------------------------------------------------
-----------
c713 Aquifer Pollutant Background Concentration
c
c AquiferID = Unique Aquifer identifier as in c712
c Ci        = Background concentration for pollutant i (mg/l)
c             Where i = 1 to N (N = Number of QUAL from card 705)
c
c AQUIFER_ID   QUALC1  QUALC2 ... QUALCN
c---------------------------------------------------------------------------------------------------------------
-----------
c715 BMP SITE INFORMATION
c
c BMPSITE   = Unique BMP site identifier
c BMPNAME   = BMP template name or site name
c BMPTYPE   = Unique BMP Types (must use the exact same keyword)
c
(BIORETENTION,WETPOND,CISTERN,DRYPOND,INFILTRATIONTRENCH,GREENROOF,POROUSPAVEMENT,RAINBARREL,REGULATOR,SWALE,CON
DUIT,BUFFERSTRIP,AREABMP)
c DArea     = Total Drainage Area in acre
c NUMUNIT   = Number of BMP structures
c DDAREA    = Design drainage area of the BMP structure (acre)
c PreLUType = Predevelopment land use type (for external land simulation option)
c AquiferID = Unique Aquifer ID, 0 --- no aquifer (for external land simulation option)
c FtableFLG = Ftable flag, 0 = no, 1 = yes (for BMP Class A, B, and C)
c FTABLE_ID = Unique Ftable identifier (continuous string) as in card 714
c
c BMPSITE      BMPNAME BMPTYPE DArea   NUMUNIT DDAREA  PreLUType      AquiferID      FtableFLG      FTABLE_ID
out     SubwatershedOutlet     JUNCTION       0       1       0       1       0       0       No      0
ut      UntreatedFlow  JUNCTION       0       1       0       1       0       0       No      0
TBDBMP  BioretentionType1      BIORETENTION   0       1       0       1       0       0       No      0
DW_6665 BioretentionType1      INFILTRATIONTRENCH     1       1       0       1       0       0       No      0
DW_6671 BioretentionType1      INFILTRATIONTRENCH     1       1       0       1       0       0       No      0
DW_6673 BioretentionType1      INFILTRATIONTRENCH     1       1       0       1       0       0       No      0
DW_6674 BioretentionType1      INFILTRATIONTRENCH     1       1       0       1       0       0       No      0
DW_6675 BioretentionType1      INFILTRATIONTRENCH     1       1       0       1       0       0       No      0
DW_6684 BioretentionType1      INFILTRATIONTRENCH     1       1       0       1       0       0       No      0
DW_6839 BioretentionType1      INFILTRATIONTRENCH     1       1       0       1       0       0       No      0
DW_6844 BioretentionType1      INFILTRATIONTRENCH     1       1       0       1       0       0       No      0
DW_6850 BioretentionType1      INFILTRATIONTRENCH     1       1       0       1       0       0       No      0
DW_6856 BioretentionType1      INFILTRATIONTRENCH     1       1       0       1       0       0       No      0
DW_6859 BioretentionType1      INFILTRATIONTRENCH     1       1       0       1       0       0       No      0
DW_6861 BioretentionType1      INFILTRATIONTRENCH     1       1       0       1       0       0       No      0
sewer   Sewer   JUNCTION       0       1       0       1       0       0       0       0
c---------------------------------------------------------------------------------------------------------------
-----------
c720 Point Source Definition
```

```
c
c point source timeseries data must be in this order;  flow (in.-acre/timestep), pollutant 1 (lbs/timestep), pollutant2, ...
c
c POINTSOURCE    = Unique point source identifier
c DESCRIPTION    = point source description (a continuous string without any space)
c BMPSITE        = BMP site identifier in card 715
c MULTIPLIER     = Multiplier applied to the timeseries file (flow and pollutants). It will be in addition to the pollutant multiplier in card 705
c TIMESERIESFILE = File name containing input timeseries
c SAND_FRAC      = The fraction of total sediment which is sand (0-1)
c SILT_FRAC      = The fraction of total sediment which is silt (0-1)
c CLAY_FRAC      = The fraction of total sediment which is clay (0-1)
c
c POINTSOURCE  BMPSITE MULTIPLIER     TIMESERIESFILE SAND_FRAC      SILT_FRAC      CLAY_FRAC
1      Inflow_1      DW_6665 1      6665.out      0      0      0
2      Inflow_2      DW_6671 1      6671.out      0      0      0
3      Inflow_3      DW_6673 1      6673.out      0      0      0
4      Inflow_4      DW_6674 1      6674.out      0      0      0
5      Inflow_5      DW_6675 1      6675.out      0      0      0
6      Inflow_6      DW_6684 1      6684.out      0      0      0
7      Inflow_7      DW_6839 1      6839.out      0      0      0
8      Inflow_8      DW_6844 1      6844.out      0      0      0
9      Inflow_9      DW_6850 1      6850.out      0      0      0
10     Inflow_10     DW_6856 1      6856.out      0      0      0
11     Inflow_11     DW_6859 1      6859.out      0      0      0
12     Inflow_12     DW_6861 1      6861.out      0      0      0
c---------------------------------------------------------------------------------------------
c721 Tier-1 Watershed Outlets Definition
c
c BMPSITE     = BMP site (watershed outlet) identifier in card 715
c NUMBREAKS   = Number of break points on the cost-effectiveness curve
c CECurveFile = CECurve_Solutions file for the project cost (sorted cost value) of each break point
c
c BMPSITE      NUMBREAKS      CECurveFile
c-----------------------------------------------------------------------------------------------------------------------
c722 Tier-1 Watershed Timeseries Definition
c
c BMPSITE        = BMP site (watershed outlet) identifier in card 721
c BREAKPOINTID   = Unique break point id on cost-effectiveness curve
c                  (0 for initial, -1 for PreDev, and -2 for PostDev condition)
c MULTIPLIER     = Multiplier applied to the timeseries file
c TIMESERIESFILE = Timeseries output file corresponding to the breakpoint id
c
c  BMPSITE     BREAKPOINTID   MULTIPLIER     TIMESERIESFILE
c-----------------------------------------------------------------------------------------------------------------------
c723 Pump Curve (applies if PUMP_FLG is ON in card 725)
c
c PUMP_CURVE = The unique name of pump curve (continuous string without space)
c NUM_RECORD = Number of points on the curve
c
c DEPTH      = Depth (ft)
c FLOW       = Pumping flow rate (cfs)
c
c PUMP_CURVE   NUM_RECORD
c DEPTH FLOW
Qinf_6665      2
0      8
50     8
Qinf_6671      2
0      4.8
50     4.8
Qinf_6673      2
0      7.2
50     7.2
Qinf_6674      2
0      4.8
50     4.8
Qinf_6675      2
0      2.4
50     2.4
Qinf_6684      2
0      0.8
50     0.8
Qinf_6839      2
0      22.4
50     22.4
```

```
Qinf_6844      2
0       10.4
50      10.4
Qinf_6850      2
0       31.2
50      31.2
Qinf_6856      2
0       11.2
50      11.2
Qinf_6859      2
0       32
50      32
Qinf_6861      2
0       19.2
50      19.2
c---------------------------------------------------------------------------------------------------------------
-----------
c725 CLASS-A BMP Site Parameters (required if BMPSITE is CLASS-A in card 715)
c
c BMPSITE = Class A BMP dimension group identifier in card 715
c WIDTH   = Basin bottom width (ft)
c LENGTH  = Basin bottom length (ft) / diameter (ft) for rain barrel or cistern
c OHEIGHT = Orifice Height (ft)
c DIAM    = Orifice Diameter (in)
c CCOEF   = Contraction Coefficient, user-specified value between 0 and 1 (e.g., Rounded = 1.0, Short Tube =
0.8, Sharp-edged = 0.61, Borda = 0.5)
c RELTP   = Release Type   (1-Cistern, 2-Rain barrel, 3-others)
c PEOPLE  = Number of persons (Cistern Option)
c DDAYS   = Number of dry days (Rain Barrel Option)
c WEIRTP  = Weir Type   (1-Rectangular,2-Triangular)
c WEIRH   = Weir Height (ft)
c WEIRW   = (weir type 1) Weir width  (ft)
c THETA   = (weir type 2) Weir angle  (degrees)
c ET_MULT = multiplier to PET
c PUMP_FLG = pump option (0-OFF, 1-ON)
c DEPTH_ON = water Depth (ft) at which the pump is started
c DEPTH_OFF = water Depth (ft) at which the pump is stopped
c PUMP_CURVE = The unique name of pump curve (continuous string without space)
c BYPASS_FRAC = Fraction of inflow that bypasses the BMP when full (0.0-1.0)
c DIV_RATE   = Maximum flow diversion rate into BMP (cfs)
c
c BMPSITE   WIDTH   LENGTH  OHEIGHT DIAM    EXITYPE RELEASETYPE PEOPLE  DDAYS  WEIRTYPE WEIRH WEIRW THETA
ET_MULT PUMP_FLG DEPTH_ON DEPTH_OFF PUMP_CURVE      BYPASS_FRAC    DIV_RATE
TBDBMP  0       0       0       0       0.61    3       0       0       1       0.5     10000   0       0       0
        0       0       none    0       -1
DW_6665 10      7.16    0       0.1     0.61    3       0       0       1       45      10000   0       0       1
        5       1       Qinf_6665       0       -1
DW_6671 10      4.29    0       0.1     0.61    3       0       0       1       45      10000   0       0       1
        5       1       Qinf_6671       0       -1
DW_6673 10      6.44    0       0.1     0.61    3       0       0       1       45      10000   0       0       1
        5       1       Qinf_6673       0       -1
DW_6674 10      4.29    0       0.1     0.61    3       0       0       1       45      10000   0       0       1
        5       1       Qinf_6674       0       -1
DW_6675 10      2.15    0       0.1     0.61    3       0       0       1       45      10000   0       0       1
        5       1       Qinf_6675       0       -1
DW_6684 10      0.72    0       0.1     0.61    3       0       0       1       45      10000   0       0       1
        5       1       Qinf_6684       0       -1
DW_6839 10      20.04   0       0.1     0.61    3       0       0       1       45      10000   0       0       1
        5       1       Qinf_6839       0       -1
DW_6844 10      9.30    0       0.1     0.61    3       0       0       1       45      10000   0       0       1
        5       1       Qinf_6844       0       -1
DW_6850 10      27.91   0       0.1     0.61    3       0       0       1       45      10000   0       0       1
        5       1       Qinf_6850       0       -1
DW_6856 10      10.02   0       0.1     0.61    3       0       0       1       45      10000   0       0       1
        5       1       Qinf_6856       0       -1
DW_6859 10      28.62   0       0.1     0.61    3       0       0       1       45      10000   0       0       1
        5       1       Qinf_6859       0       -1
DW_6861 10      17.17   0       0.1     0.61    3       0       0       1       45      10000   0       0       1
        5       1       Qinf_6861       0       -1
c---------------------------------------------------------------------------------------------------------------
-----------
c730  Cistern Control Water Release Curve (applies if release type is cistern in card 725)
c
c BMPSITE = Class A BMP dimension group identifier in card 715
c Flow    = Hourly water release per capita from the Cistern Control (ft3/hr/capita)
c
c BMPSITE      FLOW
TBDBMP  0       0       0       0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0
```

```
DW_6665 0       0       0       0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0
DW_6671 0       0       0       0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0
DW_6673 0       0       0       0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0
DW_6674 0       0       0       0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0
DW_6675 0       0       0       0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0
DW_6684 0       0       0       0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0
DW_6839 0       0       0       0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0
DW_6844 0       0       0       0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0
DW_6850 0       0       0       0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0
DW_6856 0       0       0       0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0
DW_6859 0       0       0       0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0
DW_6861 0       0       0       0       0       0       0       0       0       0       0       0       0       0
        0       0       0       0       0       0       0       0       0       0
c---------------------------------------------------------------------------------------------------------------
-----------
c735 CLASS B BMP Site DIMENSION GROUPS
c
c BMPSITE  = BMP Site identifier in card 715
c WIDTH    = basin bottom width (ft)
c LENGTH   = basin bottom Length (ft)
c MAXDEPTH = Maximum depth of channel (ft)
c SLOPE1   = Side slope 1 (ft/ft)
c SLOPE2   = Side slope 2 (ft/ft)   (1-4)
c SLOPE3   = Side slope 3 (ft/ft)
c MANN_N   = Manning  's roughness coefficient
c ET_MULT  = multiplier to PET
c
c BMPSITE      WIDTH   LENGTH  MAXDEPTH       SLOPE1  SLOPE2  SLOPE3  MANN_N  ET_MULT
c---------------------------------------------------------------------------------------------------------------
-----------
c740 BMP Site BOTTOM SOIL/VEGITATION CHARACTERISTICS
c
c BMPSITE   =  BMPSITE identifier in c715
c INFILTM   =  Infiltration Method (0-Green Ampt, 1-Horton, 2-Holtan)
c POLROTM   =  Pollutant Routing Method (1-Completely mixed, >1-number of CSTRs in series)
c POLREMM   =  Pollutant Removal Method (0-1st order decay, 1-kadlec and knight method, 2-user defined
concentration)
c SDEPTH    =  Soil Depth (ft)
c POROSITY  =  Soil Porosity (0-1)
c FCAPACITY =  Soil Field Capacity (ft/ft)
c WPOINT    =  Soil Wilting Point (ft/ft)
c AVEG      =  Vegetative Parameter A (0.1-1.0) (Empirical), only required for Holtan infiltration method
c FINFILT   =  Soil layer infiltration rate (in/hr)
c UNDSWITCH =  Underdrain option (0-No underdrain, 1-underdrain with percent removal rate, 2-underdrain with
constant effluent conc.)
c UNDDEPTH  =  Depth of storage media below underdrain (ft)
c UNDVOID   =  Fraction of underdrain storage depth that is void space (0-1)
c UNDINFILT =  Background infiltration rate, below underdrain (in/hr)
c SUCTION   =  Average value of soil capillary suction along the wetting front, value must be greater than zero
(in), only required for Green-Ampt infiltration method
c IMDMAX    =  Difference between soil porosity and initial moisture content, value must be greater than or
equal to zero (a fraction), only required for Green-Ampt infiltration method
c MAXINFILT =  Maximum rate on the Horton infiltration curve (in/hr), only required for Horton infiltration
method
c DECAYCONS =  Decay constant for the Horton infiltration curve (1/hr), only required for Horton infiltration
method
c DRYTIME   =  Time for a fully staurated soil to completely dry (day), only required for Horton infiltration
method
c MAXVOLUME =  Maximum infiltration volume possible (in), only required for Horton infiltration method
c
c BMPSITE   INFILTM POLROTM POLREMM SDEPTH  POROSITY    FCAPACITY   WPOINT  AVEG    FINFILT UNDSWITCH   UNDDEPTH
UNDVOID UNDINFILT   SUCTION IMDMAX  MAXINFILT   DECAYCONS   DRYTIME MAXVOLUME
TBDBMP  2       1       0       2       0.35    0.3     0.15    0.6     1       0       1.5     0.4     1       0
        0       3       4       7       0
DW_6665 2       1       0       0       0.4     0.3     0.15    0       0       0       1       0.4     0.75    0
        0       3       4       7       0
DW_6671 2       1       0       0       0.4     0.3     0.15    0       0       0       1       0.4     0.75    0
        0       3       4       7       0
```

```
DW_6673 2       1       0       0       0.4     0.3     0.15    0       0       0       1       0.4     0.75    0
        0       3       4       7       0
DW_6674 2       1       0       0       0.4     0.3     0.15    0       0       0       1       0.4     0.75    0
        0       3       4       7       0
DW_6675 2       1       0       0       0.4     0.3     0.15    0       0       0       1       0.4     0.75    0
        0       3       4       7       0
DW_6684 2       1       0       0       0.4     0.3     0.15    0       0       0       1       0.4     0.75    0
        0       3       4       7       0
DW_6839 2       1       0       0       0.4     0.3     0.15    0       0       0       1       0.4     0.75    0
        0       3       4       7       0
DW_6844 2       1       0       0       0.4     0.3     0.15    0       0       0       1       0.4     0.75    0
        0       3       4       7       0
DW_6850 2       1       0       0       0.4     0.3     0.15    0       0       0       1       0.4     0.75    0
        0       3       4       7       0
DW_6856 2       1       0       0       0.4     0.3     0.15    0       0       0       1       0.4     0.75    0
        0       3       4       7       0
DW_6859 2       1       0       0       0.4     0.3     0.15    0       0       0       1       0.4     0.75    0
        0       3       4       7       0
DW_6861 2       1       0       0       0.4     0.3     0.15    0       0       0       1       0.4     0.75    0
        0       3       4       7       0
c---------------------------------------------------------------------------------------------------------------
-----------
c745 BMP Site HOLTAN GROWTH INDEX
c
c HOLTAN EQUATION:    F = GI * AVEG * (Computed Available Soil Storage)^ 1.4 + FINFILT
c
c BMPSITE = BMPSITE identifier in card 715
c GIi = 12 monthly values for GI in HOLTAN equation
c          Where i = jan, feb, mar...dec
c
c BMPSITE   jan feb mar apr may jun jul aug sep oct nov dec
TBDBMP  0       0       0       0       0       0       0       0       0       0       0       0
DW_6665 0       0       0       0       0       0       0       0       0       0       0       0
DW_6671 0       0       0       0       0       0       0       0       0       0       0       0
DW_6673 0       0       0       0       0       0       0       0       0       0       0       0
DW_6674 0       0       0       0       0       0       0       0       0       0       0       0
DW_6675 0       0       0       0       0       0       0       0       0       0       0       0
DW_6684 0       0       0       0       0       0       0       0       0       0       0       0
DW_6839 0       0       0       0       0       0       0       0       0       0       0       0
DW_6844 0       0       0       0       0       0       0       0       0       0       0       0
DW_6850 0       0       0       0       0       0       0       0       0       0       0       0
DW_6856 0       0       0       0       0       0       0       0       0       0       0       0
DW_6859 0       0       0       0       0       0       0       0       0       0       0       0
DW_6861 0       0       0       0       0       0       0       0       0       0       0       0
c---------------------------------------------------------------------------------------------------------------
-----------
c747 BMP Site Initial Moisture Content
c
c BMPSITE  = BMP Site identifier in card 715
c WATDEP_i = initial surface water depth (ft)
c THETA_i  = initial soil moisture (ft/ft)
c
c BMPSITE      WATDEP_i       THETA_i
TBDBMP  0       0.15
DW_6665 0       0.15
DW_6671 0       0.15
DW_6673 0       0.15
DW_6674 0       0.15
DW_6675 0       0.15
DW_6684 0       0.15
DW_6839 0       0.15
DW_6844 0       0.15
DW_6850 0       0.15
DW_6856 0       0.15
DW_6859 0       0.15
DW_6861 0       0.15
c---------------------------------------------------------------------------------------------------------------
-----------
c750 Class-C Conduit Parameters (required if BMPSITE is CLASS-C in card 715)
c
c BMPSITE     = BMP site identifier in card 715
c INLET_NODE  = BMP Id at the entrance of the conduit
c OUTLET_NODE = BMP Id at the exit of the conduit
c LENGTH      = Conduit length (ft)
c MANNING_N   = Manning's roughness coefficient
c INLET_IEL   = Invert Elevation at the entrance of the conduit (ft)
c OUTLET_IEL  = Invert Elevation at the exit of the conduit (ft)
c INIT_FLOW   = Initial flow in the conduit (cfs)
c INLET_HL    = Head loss coefficient at the entrance of the conduit
```

```
c OUTLET_HL   = Head loss coefficient at the exit of the conduit
c AVERAGE_HL  = Head loss coefficient along the length of the conduit
c
c BMPSITE      INLET_NODE     OUTLET_NODE    LENGTH  MANNING_N      INLET_IEL      OUTLET_IEL     INIT_FLOW
       INLET_HL       OUTLET_HL      AVERAGE_HL
c-----------------------------------------------------------------------------------------------------------------
-----------
c755 Class C Conduit Cross Sections
c
c LINK    = BMP site identifier in card 715
c TYPE    = Conduit Type (rectangular, circular...)
c GEOM1   = Geometric cross-sectional property of the conduit
c GEOM2   = Geometric cross-sectional property of the conduit
c GEOM3   = Geometric cross-sectional property of the conduit
c GEOM4   = Geometric cross-sectional property of the conduit
c BARRELS = Number of Barrels in the conduit
c
c LINK  TYPE    GEOM1   GEOM2   GEOM3   GEOM4   BARRELS
c-----------------------------------------------------------------------------------------------------------------
-----------
c760 Irregular Cross Sections
c
c Format of transect data follows:
c NC    nLeft   nRight  nChannel
c X1    name    nSta    xLeftBank      xRightBank     0      0      0      xFactor yFactor
c GR    Elevation      Station  ...
c-----------------------------------------------------------------------------------------------------------------
-----------
c761 BufferStrip BMP Parameters (required if BMPTYPE is BUFFERSTRIP in card 715)
c
c BMPSITE   = BMP site identifier in card 715
c Width     = BMP width (ft)
c FLength   = Flow length (ft)
c DStorage  = Surface depression storage (in)
c SLOPE     = Overland slope (ft / ft)
c MANNING_N = Overland Manning's roughness coefficient
c POLREMM   = Pollutant Removal Method (0-1st order decay, 1-kadlec and knight method)
c ET_MULT   = Multiplier to PET
c
c BMPSITE      Width   FLength DStorage       SLOPE   MANNING_N      POLREMM ET_MULT
c-----------------------------------------------------------------------------------------------------------------
-----------
c762 Area BMP Parameters (required if BMPTYPE is AREABMP in card 715)
c
c BMPSITE      = BMP site identifier in card 715
c Area         = BMP area (ft2)
c FLength      = flow length (ft) note: area width = area / flow length
c DStorage     = Surface depression storage (in)
c SLOPE        = Overland slope (ft / ft)
c MANNING_N    = Overland Manning's roughness coefficient
c SAT_INFILT   = Saturated infiltration rate (in/hr)
c POLREMM      = Pollutant Removal Method (0-1st order decay, 1-kadlec and knight method)
c DCIA         = Percentage of Directly Connected Impervious Area (0-100)
c TOTAL_IMP_DA = Total Impervious Drainage Area (acre)
c
c BMPSITE      Area    FLength DStorage       SLOPE   MANNING_N      SAT_INFILT     POLREMM DCIA    TOTAL_IMP_DA
c-----------------------------------------------------------------------------------------------------------------
-----------
c765 BMP SITE Pollutant Decay/Loss rates
c
c BMPSITE    = BMP site identifier in card 715
c QUALDECAYi = First-order decay rate for pollutant i (hr^-1)
c              Where i = 1 to N (N = Number of QUAL from TIMESERIES FILES)
c
c BMPSITE      QUALDECAY1     QUALDECAY2 ... QUALDECAYN
TBDBMP  0.008333333    0.008333333    0.008333333    0.008333333    0.008333333    0.008333333    0.008333333
DW_6665 0.008333333    0.008333333    0.008333333    0.008333333    0.008333333    0.008333333    0.008333333
DW_6671 0.008333333    0.008333333    0.008333333    0.008333333    0.008333333    0.008333333    0.008333333
DW_6673 0.008333333    0.008333333    0.008333333    0.008333333    0.008333333    0.008333333    0.008333333
DW_6674 0.008333333    0.008333333    0.008333333    0.008333333    0.008333333    0.008333333    0.008333333
DW_6675 0.008333333    0.008333333    0.008333333    0.008333333    0.008333333    0.008333333    0.008333333
DW_6684 0.008333333    0.008333333    0.008333333    0.008333333    0.008333333    0.008333333    0.008333333
DW_6839 0.008333333    0.008333333    0.008333333    0.008333333    0.008333333    0.008333333    0.008333333
DW_6844 0.008333333    0.008333333    0.008333333    0.008333333    0.008333333    0.008333333    0.008333333
DW_6850 0.008333333    0.008333333    0.008333333    0.008333333    0.008333333    0.008333333    0.008333333
DW_6856 0.008333333    0.008333333    0.008333333    0.008333333    0.008333333    0.008333333    0.008333333
DW_6859 0.008333333    0.008333333    0.008333333    0.008333333    0.008333333    0.008333333    0.008333333
DW_6861 0.008333333    0.008333333    0.008333333    0.008333333    0.008333333    0.008333333    0.008333333
```

```
c--------------------------------------------------------------------------------------------------------------
-----------
c766 Pollutant K' values (applies when pollutant removal method is kadlec and knight method in card 740)
c
c BMPSITE = BMP site identifier in card 715
C QUALK'i = Constant rate for pollutant i (ft/yr)
c           Where i = 1 to N (N = Number of QUAL from card 705)
c
c BMPSITE      QUALK'1 QUALK'2 ... QUALK'N
c--------------------------------------------------------------------------------------------------------------
-----------
c767 Pollutant C* values (applies when pollutant removal method is kadlec and knight method in card 740)
c
c BMPSITE = BMP site identifier in card 715
c QUALC*i = Background concentration for pollutant i (mg/l)
c           Where i = 1 to N (N = Number of QUAL from card 705)
c
c BMPSITE      QUALC*1 QUALC*2 ... QUALC*N
c--------------------------------------------------------------------------------------------------------------
-----------
c768 Pollutant C values (applies when surface release type is 4 in card 725)
c
c BMPSITE = BMP site identifier in card 715
c QUALCi  = Constant surface release concentration for pollutant i (mg/l)
c           Where i = 1 to N (N = Number of QUAL from card 705)
c
c BMPSITE      QUALC1  QUALC2 ... QUALCN
TBDBMP  0       0       0       0       0       0       0
DW_6665 0       0       0       0       0       0       0
DW_6671 0       0       0       0       0       0       0
DW_6673 0       0       0       0       0       0       0
DW_6674 0       0       0       0       0       0       0
DW_6675 0       0       0       0       0       0       0
DW_6684 0       0       0       0       0       0       0
DW_6839 0       0       0       0       0       0       0
DW_6844 0       0       0       0       0       0       0
DW_6850 0       0       0       0       0       0       0
DW_6856 0       0       0       0       0       0       0
DW_6859 0       0       0       0       0       0       0
DW_6861 0       0       0       0       0       0       0
c--------------------------------------------------------------------------------------------------------------
-----------
c770 BMP Underdrain Pollutant Percent Removal (applies when underdrain option is "1" in card 740)
c
c BMPSITE     = BMPSITE identifier in card 715
c QUALPCTREMi = Perecent Removal for pollutant i through underdrain (0-1)
c               Where i = 1 to N (N = Number of QUAL from TIMESERIES FILES)
c
c BMPSITE      QUALPCTREM1    QUALPCTREM2 ... QUALPCTREMN
TBDBMP  0       0       0       0       0       0       0
DW_6665 0       0       0       0       0       0       0
DW_6671 0       0       0       0       0       0       0
DW_6673 0       0       0       0       0       0       0
DW_6674 0       0       0       0       0       0       0
DW_6675 0       0       0       0       0       0       0
DW_6684 0       0       0       0       0       0       0
DW_6839 0       0       0       0       0       0       0
DW_6844 0       0       0       0       0       0       0
DW_6850 0       0       0       0       0       0       0
DW_6856 0       0       0       0       0       0       0
DW_6859 0       0       0       0       0       0       0
DW_6861 0       0       0       0       0       0       0
c--------------------------------------------------------------------------------------------------------------
-----------
c771 BMP Underdrain Pollutant Effluent Concentration (applies when underdrain option is "2" in card 740)
c
c BMPSITE     = BMPSITE identifier in card 715
c QUALEFFCi   = Underdrain effluent concentration for pollutant i (mg/l)
c               Where i = 1 to N (N = Number of QUAL from TIMESERIES FILES)
c
c BMPSITE      QUALEFFC1      QUALEFFC2 ... QUALEFFCN
TBDBMP  0       0       0       0       0       0       0
DW_6665 0       0       0       0       0       0       0
DW_6671 0       0       0       0       0       0       0
DW_6673 0       0       0       0       0       0       0
DW_6674 0       0       0       0       0       0       0
DW_6675 0       0       0       0       0       0       0
DW_6684 0       0       0       0       0       0       0
DW_6839 0       0       0       0       0       0       0
```

```
DW_6844 0      0      0      0      0      0      0
DW_6850 0      0      0      0      0      0      0
DW_6856 0      0      0      0      0      0      0
DW_6859 0      0      0      0      0      0      0
DW_6861 0      0      0      0      0      0      0
c---------------------------------------------------------------------------------------------------------------
-----------
c775 Sediment General Parameters (required if pollutant type is sediment in card 705)
c
c BMPSITE = BMP site identifier in card 715
c BEDWID  = Bed width (ft) - this is constant for the entire simulation period
c BEDDEP  = Initial bed depth (ft)
c BEDPOR  = Bed sediment porosity
c
c BMPSITE      BEDWID  BEDDEP  BEDPOR
c---------------------------------------------------------------------------------------------------------------
-----------
c780 Sand Transport Parameters (required if pollutant type is sediment in card 705)
c
c BMPSITE = BMP site identifier in card 715
c D       = Effective diameter of the transported sand particles (in)
c W       = The corresponding fall velocity in still water (in/sec)
c RHO     = The density of the sand particles (lb/ft3)
c KSAND   = The coefficient in the sandload power function formula
c EXPSND  = The exponent in the sandload power function formula
c
c BMPSITE      D       W       RHO     KSAND   EXPSND
c---------------------------------------------------------------------------------------------------------------
-----------
c785 Silt Transport Parameters (required if pollutant type is sediment in card 705)
c
c BMPSITE = BMP site identifier in card 715
c D       = Effective diameter of the transported silt particles (in)
c W       = The corresponding fall velocity in still water (in/sec)
c RHO     = The density of the silt particles (lb/ft3)
c TAUCD   = The critical bed shear stress for deposition (lb/ft2)
c TAUCS   = The critical bed shear stress for scour (lb/ft2)
c M       = The erodibility coefficient of the silt particles (lb/ft2/day)
c
c BMPSITE      D       W       RHO     TAUCD   TAUCS   M
c---------------------------------------------------------------------------------------------------------------
-----------
c786 Clay Transport Parameters (required if pollutant type is sediment in card 705)
c
c BMPSITE = BMP site identifier in card 715
c D       = Effective diameter of the transported clay particles (in)
c W       = The corresponding fall velocity in still water (in/sec)
c RHO     = The density of the silt/clay particles (lb/ft3)
c TAUCD   = The critical bed shear stress for deposition (lb/ft2)
c TAUCS   = The critical bed shear stress for scour (lb/ft2)
c M       = The erodibility coefficient of the clay particles (lb/ft2/day)
c
c BMPSITE      D       W       RHO     TAUCD   TAUCS   M
c---------------------------------------------------------------------------------------------------------------
-----------
c790 LAND TO BMP ROUTING NETWORK
c
c UniqueID = Identifies an instance of LANDTYPE in SCHEMATIC
c LANDTYPE = Corresponds to LANDTYPE in c710
c AREA     = Area of LANDTYPE in ACRES
c DS       = UNIQUE ID of DS BMP (0 - no BMP, add to end)
c LCGID    = Land Control Group Identifier in card 711 (0 - no change)
c
c UniqueID     LANDTYPE       AREA    DS      LCGID
c---------------------------------------------------------------------------------------------------------------
-----------
c795 BMP Site ROUTING NETWORK
c
c BMPSITE     = BMPSITE identifier in card 715
c OUTLET_TYPE = Outlet type (1-total, 2-weir, 3-orifice or channel, 4-underdrain, 5-untreated)
c DS          = Downstrem BMP site identifier in card 715 (0 - no BMP, add to end)
c
c BMPSITE      OUTLET_TYPE    DS
ut      1      out
out     1      0
TBDBMP  1      out
sewer   1      out
DW_6665 2      ut
DW_6671 2      ut
```

```
DW_6673 2       ut
DW_6674 2       ut
DW_6675 2       ut
DW_6684 2       ut
DW_6839 2       ut
DW_6844 2       ut
DW_6850 2       ut
DW_6856 2       ut
DW_6859 2       ut
DW_6861 2       ut
DW_6665 3       sewer
DW_6665 4       sewer
DW_6665 5       out
DW_6671 3       sewer
DW_6671 4       sewer
DW_6671 5       out
DW_6673 3       sewer
DW_6673 4       sewer
DW_6673 5       out
DW_6674 3       sewer
DW_6674 4       sewer
DW_6674 5       out
DW_6675 3       sewer
DW_6675 4       sewer
DW_6675 5       out
DW_6684 3       sewer
DW_6684 4       sewer
DW_6684 5       out
DW_6839 3       sewer
DW_6839 4       sewer
DW_6839 5       out
DW_6844 3       sewer
DW_6844 4       sewer
DW_6844 5       out
DW_6850 3       sewer
DW_6850 4       sewer
DW_6850 5       out
DW_6856 3       sewer
DW_6856 4       sewer
DW_6856 5       out
DW_6859 3       sewer
DW_6859 4       sewer
DW_6859 5       out
DW_6861 3       sewer
DW_6861 4       sewer
DW_6861 5       out
c---------------------------------------------------------------------------------------------------------------
-----------
c800 Optimization Controls
c
c Technique -- Optimization Techniques
c     0 = no optimization
c     2 = NSGAII
c Option -- Optimization options
c     0 = no optimization
c     1 = specific control target and minimize cost
c     2 = generate cost effectiveness curve
c StopDelta -- Criteria for stopping the optimization iteration
c              in dollars($), meaning if the cost not improved by this criteria, stop the search (for Option 1)
c MaxRuns -- Maximum number of iterations (should be greater than 4times the number of decision variables in
card 711 and 810)
c NumBest -- Number of best solutions for output (for Option 1)
c
c Technique    Option  StopDelta      MaxRuns NumBest
0       2       0       10000   1
c---------------------------------------------------------------------------------------------------------------
-----------
c805 BMP Cost Functions
c Cost ($) = ((LinearCost)*Length^(LengthExp) + (AreaCost)*Area^(AreaExp) +
(TotalVolumeCost)*TotalVolume^(TotalVolExp)
c          + (MediaVolumeCost)*SoilMediaVolume^(MediaVolExp) +
(UnderDrainVolumeCost)*UnderDrainVolume^(UDVolExp)
c          + (ConstantCost)) * (1+PercentCost/100)
c
c BMPSITE              = BMP site identifier in card 715
c LinearCost           = Cost per unit length of the BMP structure ($/ft)
c AreaCost             = Cost per unit area of the BMP structure ($/ft^2)
c TotalVolumeCost      = Cost per unit total volume of the BMP structure ($/ft^3)
c MediaVolumeCost      = Cost per unit volume of the soil media ($/ft^3)
```

```
c UnderDrainVolumeCost = Cost per unit volume of the under drain structure ($/ft^3)
c ConstantCost         = Constant cost ($)
c PercentCost          = Cost in percentage of all other cost (%)
c LengthExp            = Exponent for linear unit
c AreaExp              = Exponent for area unit
c TotalVolExp          = Exponent for total volume unit
c MediaVolExp          = Exponent for soil media volume unit
c UDVolExp             = Exponent for underdrain volume unit
c
c BMPSITE      LinearCost     AreaCost       TotalVolumeCost       MediaVolumeCost       UnderDrainVolumeCost
       ConstantCost   PercentCost    LengthExp      AreaExp TotalVolExp    MediaVolExp    UDVolExp
TBDBMP  0       0       0       0       0       0       0       1       1       1       1       1
DW_6665 0       0       12.6    0       0       120000  0       1       1       1       1       1
DW_6671 0       0       12.6    0       0       120000  0       1       1       1       1       1
DW_6673 0       0       12.6    0       0       120000  0       1       1       1       1       1
DW_6674 0       0       12.6    0       0       120000  0       1       1       1       1       1
DW_6675 0       0       12.6    0       0       120000  0       1       1       1       1       1
DW_6684 0       0       12.6    0       0       120000  0       1       1       1       1       1
DW_6839 0       0       12.6    0       0       120000  0       1       1       1       1       1
DW_6844 0       0       12.6    0       0       120000  0       1       1       1       1       1
DW_6850 0       0       12.6    0       0       120000  0       1       1       1       1       1
DW_6856 0       0       12.6    0       0       120000  0       1       1       1       1       1
DW_6859 0       0       12.6    0       0       120000  0       1       1       1       1       1
DW_6861 0       0       12.6    0       0       120000  0       1       1       1       1       1
c-----------------------------------------------------------------------------------------------------------
-----------
c806 Diversion Structure Cost Function
c Cost ($) = ((DiversionCost)*DIV_RATE^(DiversionExp) + (ConstantCost)) * (1+PercentCost/100)
c
c BMPSITE              = BMP site identifier in card 715
c DiversionCost        = Cost per unit diversion rate ($/cfs)
c DiversionExp         = Exponent for diversion rate
c ConstantCost         = Constant cost ($)
c PercentCost          = Cost in percentage of all other cost (%)
c
c BMPSITE      DiversionCost  DiversionExp   ConstantCost   PercentCost
TBDBMP  0       1       0       0
DW_6665 25400   1       0       0
DW_6671 25400   1       0       0
DW_6673 25400   1       0       0
DW_6674 25400   1       0       0
DW_6675 25400   1       0       0
DW_6684 25400   1       0       0
DW_6839 25400   1       0       0
DW_6844 25400   1       0       0
DW_6850 25400   1       0       0
DW_6856 25400   1       0       0
DW_6859 25400   1       0       0
DW_6861 25400   1       0       0
c-----------------------------------------------------------------------------------------------------------
-----------
c810 BMP SITE Adjustable Parameters
c
c BMPSITE  = BMP site identifier in card 715
c VARIABLE = Variable name (must use the exact same keyword)
c            LENGTH --- BMP length,
c            NUMUNIT --- number of units,
c            WEIRH --- weir height,
c            SDEPTH --- soil media depth,
c            DCIA --- directly connected impervious area for area BMP type,
c            MAXDEPTH --- maximum surface storage depth for swale,
c            CECURVE --- cost-effectiveness curve for Tier-1 solution
c            DIV_RATE --- maximum flow diversion rate into BMP
c FROM     = From value in the range
c TO       = To value in the range
c STEP     = Increment step
c
c BMPSITE      VARIABLE       FROM    TO      STEP
TBDBMP  LENGTH  0       0       0
DW_6665 LENGTH  0       10      0.05
DW_6671 LENGTH  0       10      0.05
DW_6673 LENGTH  0       10      0.05
DW_6674 LENGTH  0       10      0.05
DW_6675 LENGTH  0       10      0.05
DW_6684 LENGTH  0       10      0.05
DW_6839 LENGTH  0       10      0.05
DW_6844 LENGTH  0       10      0.05
DW_6850 LENGTH  0       10      0.05
DW_6856 LENGTH  0       10      0.05
```

```
DW_6859 LENGTH  0       10      0.05
DW_6861 LENGTH  0       10      0.05
c-----------------------------------------------------------------------------------------------------------------
-----------
c814 Predeveloped Timeseries at Assessment Point for Flow Duration Curve
c
c BMPSITE    = BMP site identifier in card 715 if it is an assessment point
c NumBins    = Number of bins for flow duration curve
c PreDevFlag = Pre-developed timeseries option (1-internal,2-external)
c PreDevFile = Pre-developed timeseries file path for external option
c              The timeseries file format (AssessmentPoint_ID      Year    Month   Day     Hour    Minute
       Flow_cfs)
c              The first line is skipped (comment line) and data start from the second line in the required
format.
c
c BMPSITE      NumBins PreDevFlag     PreDevFile
c-----------------------------------------------------------------------------------------------------------------
-----------
c815 Assessment Point and Evaluation Factor
c
c BMPSITE -- BMP site identifier in card 715 if it is an assessment point
c FactorGroup -- Flow or pollutant related evaluation factor group
c    -1 = flow related evaluation factor
c     # = pollutant ID in card 705
c FactorType -- Evaluation Factor Type (negative number for flow related and positive number for pollutant
related)
c    -1 = AAFV Annual Average Flow Volume (ft3/yr)
c    -2 = PDF  Peak Discharge Flow (cfs)
c    -3 = FEF  Flow Exceeding frequency  (#times/year)
c    -4 = FDC  Flow Duration Curve (sum of sorted flow difference with pre-developed condition, cfs)
c     1 = AAL  Annual Average Load (lb/yr)
c     2 = AAC  Annual Average Concentration (mg/L)
c     3 = MAC  Maximum #days Average Concentraion (mg/L)
c FactorVal1 -- if FactorType = 3 (MAC): Maximum #Days;
c            -- if FactorType = -3 (FEF): Threshold (cfs)
c            -- if FactorType = -4 (FDC): Low flow limit (cfs)
c            -- all other FactorType : -99
c FactorVal2 -- if FactorType = -3 (FEF): Minimum inter-exceedance time (hr)
c                                         if =  0 then daily running average flow exceeding frequency
c                                         if = -1 then daily average flow exceeding frequency
c                                         otherwise minimum inter-exceedance time for simulation interval
c            -- if FactorType = -4 (FDC): High flow limit (cfs)
c            -- all other FactorType : -99
c CalcMode -- Evaluation Factor Calculation Mode
c   -99 for Option 0 (card 800): no optimizaiton
c     1 = % percent of value under existing condition (0-100)
c     2 = S scale between pre-develop and existing condition (0-1)
c     3 = V  absolute value in the unit as shown in FactorType (third block in this card)
c TargetVal1 -- Target value for evaluation factor calculation mode
c     -99 for Option 0 (card 800): no optimizaiton
c     Target value for minimize cost Option 1 (card 800)
c     Lower limit of target value for cost-effective curve Option 2 (card 800)
c TargetVal2 -- Target value for evaluation factor calculation mode
c     -99 for Option 0 (card 800): no optimizaiton
c     -99 for Option 1 (card 800): minimize cost
c     Upper limit of target value for cost-effective curve Option 2 (card 800)
c Factor_Name -- Evaluation factor name (user specified without any space), e.g. FlowVolume or SEDIMENT
c
c BMPSITE      FactorGroup    FactorType     FactorVal1     FactorVal2     CalcMode       TargetVal1
       TargetVal2     FactorName
out     7       1       -99     -99     1       0       100     PLS_TZn
ut      7       1       -99     -99     1       0       100     PLS_TZn
TBDBMP  7       1       -99     -99     1       0       100     PLS_TZn
DW_6665 7       1       -99     -99     1       0       100     PLS_TZn
DW_6671 7       1       -99     -99     1       0       100     PLS_TZn
DW_6673 7       1       -99     -99     1       0       100     PLS_TZn
DW_6674 7       1       -99     -99     1       0       100     PLS_TZn
DW_6675 7       1       -99     -99     1       0       100     PLS_TZn
DW_6684 7       1       -99     -99     1       0       100     PLS_TZn
DW_6839 7       1       -99     -99     1       0       100     PLS_TZn
DW_6844 7       1       -99     -99     1       0       100     PLS_TZn
DW_6850 7       1       -99     -99     1       0       100     PLS_TZn
DW_6856 7       1       -99     -99     1       0       100     PLS_TZn
DW_6859 7       1       -99     -99     1       0       100     PLS_TZn
DW_6861 7       1       -99     -99     1       0       100     PLS_TZn
sewer   7       1       -99     -99     1       0       100     PLS_TZn
```

# ATTACHMENTS FOR SECTION 4.1:

## NEXUS

LA DWP Los Angeles Department of Water & Power

CUSTOMERS FIRST

Eric Garcetti, Mayor

Board of Commissioners
Cynthia McClain-Hill, President
Susana Reyes, Vice President
Jill Banks Barad
Nicole Neeman Brady
Susan A. Rodriguez, Secretary

Martin L. Adams, General Manager and Chief Engineer

October 15, 2020

Los Angeles County Metropolitan Transportation Authority
Craig Reiter
One Gateway Plaza
Mail Stop 99-16-9
Los Angeles, California 90012-2952

Subject: Letter of Support for METRO Orange Line Water Infiltration and Water Quality Project

Los Angeles Department of Water and Power (LADWP) is pleased to express support for the METRO Orange Line (MOL) Water Infiltration and Water Quality Project (Project) for consideration to the Safe Clean Water Program (SCWP) Call for Projects Round two.

LADWP strongly supports multi-benefit opportunities and partnerships in projects that help achieve increases in stormwater capture, groundwater recharge, water quality, and community improvements. The Project will provide fast and reliable ridership to disadvantage communities, enhance pedestrian safety, provide significant water quality and water supply benefits, as well as support the transition to electric bus operations at the MOL. This Project will assist LADWP in achieving its long-term local supply strategies and sustainability, through augmenting local groundwater supply in the San Fernando Groundwater Basin and improving the water quality in the Los Angeles River downstream. In addition, this Project aligns with the critical needs and priorities established within the SCWP guidelines and further contributes to the development of disadvantaged communities.

LADWP intends to be a funding partner with METRO for the implementation of the Project, once it is successful in receiving SCWP Round two funding. LADWP intends to provide up to $11,088,000 for the installation of 168 drywells ($66,000 per drywell) pending LADWP Board of Commissioners' approval. Additionally, LADWP understands METRO will be responsible for operations and maintenance of the aforementioned drywells, through their viable Project life.

As a local advocate for stormwater capture projects that provide multiple benefits and long-term sustainability, LADWP strongly supports this Project and recommends that the SCWP award funding for the Project. LADWP appreciates your consideration.

If you have any questions about this letter of support, please contact Mr. Art Castro, Manager of Watershed Management, at (213) 367-2966.

Sincerely,

David R. Pettijohn
Director of Water Resources

AC:lb/cyr
c: Art Castro
Delon Kwan

ULARA

UPPER LOS ANGELES RIVER AREA WATERMASTER
Richard C. Slade - Watermaster

ularawatermaster.com

14051 Burbank Blvd, Suite 300
Sherman Oaks, CA 91401

818-506-0418 PHONE
818-506-1343 FAX

December 4, 2020

Melissa Faigeles Levitt
Los Angeles County Metropolitan Transportation Authority
(Sent via email: LevittM@metro.net)

Job No. 500-LAS04

Re: Low Impact Development Improvements
Proposed Multi-Neighborhood Stormwater Infiltration Development Project
Metro Orange Line Busway
Los Angeles, California

Dear Ms. Levitt:

Provided herein is a brief discussion of the information and reports that you have provided our office regarding your plans for the possible infiltration of stormwater that is to be collected and incorporated into the Low Impact Development (LID) improvements for the proposed multi-neighborhood stormwater infiltration development project, located in the City of Los Angeles (City), within portions of the Van Nuys and Valley Glen areas of the San Fernando Valley. We understand the project, which has a total area of ±2,000 acres, encompasses areas within the southern portions of both the Van Nuys and the Valley Glen neighborhoods. As such, this project overlies portions of the San Fernando Groundwater Basin, the largest of the four groundwater basins in the Superior Court-adjudicated Upper Los Angeles River Area (ULARA). Also provided herein, as ULARA Watermaster, is my opinion regarding the potential impact to local groundwater quality that might result from the proposed infiltration of stormwater that is to be captured by the Low Impact Development (LID) improvements that you have recommended for your project.

In regard to stormwater infiltration, the California Regional Water Quality Control Board – Los Angeles Region (LARWQCB) promulgated its National Pollutant Discharge Elimination System (NPDES) permit process in 1990 to help minimize the impacts of stormwater and urban runoff on the receiving water bodies in its sphere of influence (i.e., the Los Angeles River and the Pacific Ocean). The goal of their NPDES process was to minimize the impacts on the river, and ultimately to the ocean, by reducing the volume and improving the quality of surface water runoff from storm events. Because your proposed development is located within the ULARA watershed boundary, all local rainfall and surface water runoff from this site would normally drain into the Los Angeles River and eventually to the ocean.

Several years after the implementation of the NPDES process, the City of Los Angeles, Department of Public Works, Bureau of Sanitation – Watershed Protection Division (LAWPD), promulgated a series of guidelines intended to increase the capture and onsite infiltration of stormwater at all proposed developments and redevelopments throughout the City. These guidelines established the requirements and limitations for utilizing onsite stormwater infiltration and also specified an order of preference (via a set of Best Management Practices---BMPs) for providing LID improvements at each development and/or redevelopment site in the City.

The specific order of the BMP preference list was established by the LAWPD to collect and provide basic “treatment” of onsite stormwater runoff, and to help increase the amount of infiltration (i.e., deep percolation) from the initial ¾-inch of rainfall from each storm event at all new development and redevelopment sites in the City. The end result is intended to reduce the volumes of contaminated stormwater runoff that enter the storm drain system (from each new storm event) and simultaneously help reduce the volume and enhance the quality of the runoff that enters the Los Angeles River and ultimately the Pacific Ocean. Turbidity and potential urban-derived contaminants in the captured runoff could be reduced by the “treatment” effects of the various stormwater infiltration systems proposed via the BMPs. From a hydrogeologic perspective, and in the opinion of this Watermaster, whenever and wherever (with certain exceptions) deep percolation (infiltration) of stormwater can be appropriately enhanced, then recharge to the underlying groundwater reservoir (in this case, the San Fernando Groundwater Basin) can be beneficially increased.

For this proposed project, you sent the following for Watermaster review:

a. An email, received by the Watermaster’s office on October 15, 2020, in response to the Watermaster’s Data Request Memorandum. Your email and attachments provided responses to most of the items identified in the Watermaster’s Memorandum. Note that a copy of that Data Request Memorandum is being routinely provided by LAWPD personnel to LID applicants upon their initial visit to the LAWPD office in downtown Los Angeles.

b. A set of CAD-type drawings, prepared by the Los Angeles County Metropolitan Transportation Authority (LA Metro), which contained a project location map and a ULARA watershed plan, along with capture and recharge plans for dry well clusters

MOL-1 through MOL-7. The capture and recharge plans for MOL-1 through MOL-7 show the proposed locations of stormwater pretreatment facilities and 168 dry wells within the boundaries of the project. We understand that these proposed facilities are to be components of your stormwater infiltration system within the total ±2,200 acres of the project.

c. A soils report, *Geotechnical Review: Metro Orange Line Water Infiltration and Quality Project*, prepared by Geosyntec Consultants, Inc., and dated October 2020. The report described the earth materials encountered in the subsurface within/near the proposed project area in 23 soil borings that were drilled and sampled by others to depths in the range of approximately 35 feet below ground surface (bgs) to 193 feet bgs. It should be noted that groundwater was encountered during the drilling of some of these soil borings between the depths of approximately 77 ft bgs (April 2014) and 173 feet bgs (September 2006). Infiltration rates for the onsite earth materials were determined to a depth of approximately 50 feet bgs using hydraulic conductivity data collected from several cone penetration test (CPT) borings within/near the proposed project area.

Please note that no one from my office conducted a site visit to the subject LID property and that the information presented in this review was provided by the applicant and/or obtained from a cursory review of a few regulatory agency websites and basic sources of referenced information. Among the key items noted during our review of the available documents are the following:

1. The proposed project encompasses an area within the southern portions of both the Van Nuys and the Valley Glen neighborhoods. A Google Earth Pro® satellite image dated August 19, 2019 shows that the proposed project is located in residential and commercial areas.

2. A check of the online Geotracker database maintained by the California State Water Resources Control Board (SWRCB) shows that within 1,000 feet of the subject LID project, there are no “open” Department of Toxic Substances Control (DTSC) sites; or no “open” military cleanup sites.

   However, there is an “open” cleanup site listed as “Systron Donner (Former)” that reportedly exists at 14837 Califa Street; this site is located approximately 800 feet southeast from the intersection of Kester Avenue and the Orange Line Busway. Thus, this “open” site is adjacent to the proposed dry well cluster location designated as MOL-1. Per the Geotracker website, the cleanup site is listed as “Open – Remediation as of 5/20/2019”. According to the *Groundwater and Soil Vapor Extraction System Operation, Maintenance, and Monitoring Report: 3rd Quarter 2020*, dated October 15, 2020 and prepared by the site consultant, depth to groundwater ranged from approximately 174 feet to 176 feet bgs beneath this offsite property, and the local groundwater flow direction is toward the northeast. Volatile organic compounds (VOCs), specifically the contaminant known as trichloroethene (TCE), was detected in groundwater samples collected beneath this offsite property, at a maximum concentration of 1.5 micrograms per liter (µg/L). This value is below the SWRCB Primary Maximum Contaminant Level (MCL) for TCE (5 µg/L) for drinking water.

There is an "open" leaking underground storage tank (LUST) site listed as "L.T. Sawyer, Inc." that reportedly exists at 14117 Aetna Street; this site is located at the southwestern corner of the intersection of Hazeltine Avenue and Aetna Street. Thus, this "open" LUST site is adjacent to the proposed dry well cluster location designated as MOL-4. According to the Geotracker website, this LUST site is listed as "Open – Remediation as of 2/2/2011". According to the *Groundwater Monitoring and Status Report: Second Quarter 2020*, dated July 9, 2020 and prepared by the site consultant, depth to groundwater ranged from approximately 169 feet to 176 feet bgs beneath this offsite property; the local groundwater flow direction is toward the southeast. VOCs, specifically the contaminants benzene, methyl tertiary butyl ether (MTBE), tetrachloroethene (PCE), and TCE, were detected in groundwater samples collected beneath this offsite property. Maximum concentrations of 9.5 µg/L for benzene, 2,975 µg/L for MTBE, 460 µg/L for PCE, and 990 µg/L for TCE were detected in groundwater samples collected beneath this site. These values are above the SWRCB MCL for benzene (1 µg/L), MTBE (13 µg/L), PCE (5 µg/L), and TCE (5 µg/L) for drinking water.

In addition, the proposed dry well cluster site near the intersection of Hazeltine Avenue and the Orange Line Busway, also a part of the MOL-4 designation, is located within an area of known groundwater contamination as shown on Draft figures (not included herein) prepared by the United States Environmental Protection Agency (EPA; 2019) for the eastern portion of the San Fernando Groundwater Basin. Those Draft maps illustrate the approximate areal extents and concentrations of various contaminant plumes in the local groundwater known to be present (through 2019) from certain VOCs, such as: PCE; 1,2,3-trichloropropane (TCP); TCE; and 1,4-dioxane. Other contaminate plume maps are for nitrate, total chromium (Cr), and hexavalent chromium (CrVI). Specifically, the proposed MOL-4 location is within an area where the nearest contour lines for PCE and TCE suggest that these contaminants are present at concentrations ranging from 5 to 49 µg/L for PCE and TCE, respectively, in the groundwater beneath this proposed dry well location. These values are at or above the MCL for PCE (5 µg/L) and TCE (5 µg/L) for drinking water purposes.

Based on email communications with LA Metro, the Watermaster agrees with the proposal to relocate the proposed MOL-4 location approximately 500 feet to the west of the "open" LUST site and the EPA-defined plumes. This will allow the infiltration of stormwater at the relocated MOL-4 dry well cluster location to be outside of both the VOC-impacted groundwater associated with the LUST site and the EPA-defined plumes (2019).

3. As shown in the CAD-type drawings provided by LA Metro, stormwater will be collected from rainfall that flows as sheet flow across non-permeable paved areas within the proposed project area. The collected stormwater is to be directed to one of the 168 proposed dry wells (i.e., the infiltration systems). Each dry well is proposed to be constructed to a depth of approximately 45 feet bgs. Stormwater directed to the infiltration systems would reportedly be able to infiltrate into the subsurface (i.e., made

available for deep percolation). The proposed infiltration systems are to be constructed within seven dry well cluster locations throughout the proposed project area.

It should be noted that the purpose of this LID stormwater infiltration review letter from the Watermaster's office is not in any way to evaluate and/or opine on the technical feasibility of the infiltration of stormwater at the site, but rather only to assess the concept of infiltration (and recharge) at the site strictly in regard to its potential impact on local groundwater quality. Thus, the Watermaster has no opinion regarding the potential for, or the technical feasibility of, the collected stormwater to be infiltrated into the earth materials beneath the subject property.

Further, your eventual LID permit from the LAWPD will require the property owner(s) [and all successors] to provide for ongoing operation and maintenance in perpetuity for all of the onsite LID facilities. The Watermaster considers this issue of ongoing maintenance of your proposed LID facilities to be critical to the long-term protection of the groundwater quality in the San Fernando Basin.

Based on our review of your documents, and assuming that the final stormwater collection system and infiltration systems are constructed as proposed and properly maintained in the future, and further assuming the specific dry well sites are moved out of the local contaminant plumes as discussed herein, then the Watermaster has no objection to the infiltration component of your current LID, in relation to the local groundwater quality. If the project and/or your LID and/or your infiltration system is revised in the future and differs from that which has been generally characterized herein, the Watermaster would then need to review those revised plans.

Respectfully submitted,

Richard C. Slade
ULARA Watermaster

# ATTACHMENTS FOR SECTION 4.2:

# BENEFIT MAGNITUDE

# ATTACHMENTS FOR SECTION 4.3:

## COST EFFECTIVENESS

Geosyntec consultants

engineers | scientists | innovators

# Cost Estimate and Cost Effectiveness Calculation

## Metro Orange Line Water Infiltration and Quality Project

# 1. INTRODUCTION

The Metro Orange Line Water Infiltration and Quality Project (Project) proposes to design and implement infiltration best management practices (BMPs) within Los Angeles County Metropolitan Transportation Authority (LA Metro) parcels and right-of-way (ROW) in the San Fernando Valley area of the City of Los Angeles. The purpose of the Project is to capture and infiltrate stormwater runoff helping to recharge the groundwater basin, to improve downstream water quality, and to mitigate localized nuisance flooding in disadvantaged communities and other neighborhoods with significant unmet needs. Drywells and associated pretreatment facilities are the primary type of infiltration BMPs proposed for this Project. The proposed Project will be integrated into the MOL BRT Improvement Project to streamline the implementation process and to save cost during project construction.

To support the Project's Safe Clean Water Program application, this attachment documents the calculation of the capital and annual Project costs and presents an alternative method on determining the Project's cost effectiveness.

# 2. CAPITAL COSTS

Project capital costs include those for planning, design, and construction of 168 drywells, seven pretreatment facilities, six pump stations, six diversion structures and other miscellaneous structures (Table 1). Post-construction monitoring is only planned for Years 3 through 5 and they are included with the construction costs. Detailed cost breakdown can be found in Appendix A.

**Table 1: Capital Cost Estimate**

| Phase | Description | Cost |
|---|---|---|
| Planning | Planning includes early concept design, site investigations, and CEQA and other environmental impact studies and permitting | $241,000 |
| Design | Design includes pre-project monitoring, site investigations, formal project design, and intermediate and final project completion audits. | $2,153,000 |
| Construction | Construction cost includes the cost of labor, equipment, material, plus overhead and contingencies[1]. In addition, it includes the present value of 2-years post-construction monitoring[2]. | $27,829,000 |
| | **Total Capital Cost** | $30,223,000 |

---

[1] Typically, overhead and contingencies can account for potential complications during the permitting, staging , site access stage

[2] Please see the Monitoring Plan for planned monitoring activities.

## 3. ANNUAL COSTS

Annual costs are estimated for years 3 through 33, based on a 30-year Project life cycle. Annual costs include inspection/maintenance and operation of the stormwater BMPs (Table 2). Detailed breakdown of the project cost can be found in the O&M Plan uploaded under the “Operation and Maintenance” section of this application.

**Table 2: Annual Project Cost**

| Annual Cost | | |
|---|---|---|
| **Item** | **Description** | **Cost** |
| Inspection and Maintenance | Cost includes material, labor, equipment and waste disposal associated with inspecting, repairing drywells, pretreatment facilities, and pump stations | $741,000 |
| Operation | Cost includes labor and energy cost associated with operating pump stations, and labor cost associated with inspecting drywells and pretreatment facilities | $82,000 |
| **Total** | | **$823,000** |

## 4. COST-SHARE SUMMARY

Committed cost-share is summarized in Table 3. Additional supporting documentation has been uploaded to the “Cost & Schedule → Cost-Share” section in this application.

**Table 3: Cost-Share Summary**

| Funding Type | Description | Funding Amount | Cost-Share as % of Capital Cost |
|---|---|---|---|
| Agreement | Cost-share provided by LADWP to fund the Project | $11,088,000 | 37% |

## 5. TOTAL AND ANNUALIZED LIFE-CYCLE COSTS

Total and annualized life-cycle costs[3] before and after factoring the committed cost-share are calculated using formulas used in the SCW Online Project Module (Table 4). A 3.375% annual discount rate is used to maintain consistency with the SCW Online Project Module.

---

[3] Determined based on 3-year of construction and 30-year of operation.

**Table 4: Total and Annual Life-Cycle Costs Summary**

| | |
|---|---|
| **Total Capital Cost** | $30,223,000 |
| **Project Cost Minus Committed Cost-Share** | $19,135,000 |
| **Present Value of 30-Year O&M Cost** | $15,193,000 |
| **Total Life Cycle Cost** | $45,599,521 |
| **Annualized Life Cycle Cost** | $2,430,808 |
| **Total Life Cycle Cost (Exclude Committed Cost-Share)** | $36,905,521 |
| **Annualized Life Cycle Cost (Exclude Committed Cost-Share)** | $1,975,300 |

## 6. COST EFFECTIVENESS

As presented in the “Water  Supply –> Benefit Module” section in this application, the Project can capture and recharge 890 acre-feet of dry and stormwater runoff into the San Fernando Valley Groundwater Basin on an annual basis. In lieu of the Safe Clean Water Project Module’s built-in formula, we propose computing the cost effectiveness based on the life cycle cost minus the committed cost-share:

$$Cost\ Effectivness = \frac{\text{Annualized Life Cycle Cost (Exclude Committed Cost Share)}}{Annual\ Water\ Supply\ Benefit} = \frac{\$1{,}975{,}300/year}{890\ ac{-}ft/year} = \$2{,}219\ per\ ac - ft$$

# APPENDIX A

## Cost Estimate Breakdown

## MOL 1

| Item | Description | Qty | Unit | Unit Price | Total |
|---|---|---|---|---|---|
| 1 | Diversion Structure | 1 | LS | $ 52,000 | $ 52,000 |
| 2 | 20" PVC to Lift Station | 110 | LF | $ 400 | $ 44,000 |
| 3 | Lift Station | 1 | LS | $ 222,000 | $ 222,000 |
| 4 | 20" PVC to Pretreatment | 40 | LF | $ 300 | $ 12,000 |
| 5 | Pretreatment | 1 | LS | $ 74,000 | $ 74,000 |
| 6 | 20" PVC Distribution | 460 | LF | $ 300 | $ 138,000 |
| 7 | 20"x6" Double Y | 12 | EA | $ 6,000 | $ 72,000 |
| 8 | 6" PVC to Drywells | 480 | LF | $ 150 | $ 72,000 |
| 9 | Drywells | 24 | EA | $ 60,000 | $ 1,440,000 |
| 10 | Traffic Control and Restriping | 1 | LS | $ 25,000 | $ 25,000 |
| 11 | Site Restoration | 1 | LS | $ 25,000 | $ 25,000 |
| 12 | Pavement Restroration | 5,000 | SF | $ 7 | $ 35,000 |
| 13 | Mobilization/Demobilization | 1 | LS | $ 331,650 | $ 331,650 |
| 14 | Contingency @ 30% | 1 | LS | $ 663,300 | $ 663,300 |
|  |  |  |  | **Subtotal** | **$ 3,205,950** |
|  |  |  |  | *Planning and Pemitting* | *$ 33,000* |
|  |  |  |  | *Engineering Design* | *$ 289,000* |
|  |  |  |  | *Construction Management* | *$ 321,000* |
|  |  |  |  | *Administration* | *$ 97,000* |
|  |  |  |  | **Total Estimate for MOL 1** | **$ 3,950,000** |
|  |  |  |  | **Cost per Drywell** | **$ 164,583** |

## MOL 2

| Item | Description | Qty | Unit | Unit Price | Total |
|---|---|---|---|---|---|
| 1 | Diversion Structure | 1 | LS | $ 96,000 | $ 96,000 |
| 2 | 20" PVC to Lift Station | 100 | LF | $ 400 | $ 40,000 |
| 3 | Lift Station | 1 | LS | $ 324,000 | $ 324,000 |
| 4 | 20" PVC to Pretreatment | 10 | LF | $ 300 | $ 3,000 |
| 5 | Pretreatment | 1 | LS | $ 96,000 | $ 96,000 |
| 6 | 20" PVC Distribution | 1,650 | LF | $ 300 | $ 495,000 |
| 7 | 20"x6" Double Y | 0 | EA | $ 6,000 | $ - |
| 8 | 6" PVC to Drywells | 480 | LF | $ 150 | $ 72,000 |
| 9 | Drywells | 40 | EA | $ 60,000 | $ 2,400,000 |
| 10 | Traffic Control and Restriping | 1 | LS | $ 25,000 | $ 25,000 |
| 11 | Site Restoration | 1 | LS | $ 30,000 | $ 30,000 |
| 12 | Pavement Restroration | 10,000 | SF | $ 7 | $ 70,000 |
| 13 | Mobilization/Demobilization | 1 | LS | $ 547,650 | $ 547,650 |
| 14 | Contingency @ 30% | 1 | LS | $ 1,095,300 | $ 1,095,300 |
|  |  |  |  | **Subtotal** | **$ 5,293,950** |
|  |  |  |  | *Planning and Pemitting* | *$ 53,000* |
|  |  |  |  | *Engineering Design* | *$ 477,000* |
|  |  |  |  | *Construction Management* | *$ 530,000* |
|  |  |  |  | *Administration* | *$ 159,000* |
|  |  |  |  | **Total Estimate for MOL 2** | **$ 6,520,000** |
|  |  |  |  | **Cost per Drywell** | **$ 163,000** |

# Metro Orange Line Water Infiltration and Cost Estaimte

## MOL 3

| Item | Description | Qty | Unit | Unit Price | Total |
|---|---|---|---|---|---|
| 1 | Diversion Structure | 1 | LS | $ 69,000 | $ 69,000 |
| 2 | 20" PVC to Lift Station | 400 | LF | $ 400 | $ 160,000 |
| 3 | Lift Station | 1 | LS | $ 216,000 | $ 216,000 |
| 4 | 20" PVC to Pretreatment | 45 | LF | $ 300 | $ 13,500 |
| 5 | Pretreatment | 1 | LS | $ 74,000 | $ 74,000 |
| 6 | 18" PVC Distribution | 350 | LF | $ 275 | $ 96,250 |
| 7 | 18"x6" Double Y | 5 | EA | $ 3,500 | $ 17,500 |
| 8 | 18"x6" Y | 4 | EA | $ 5,000 | $ 20,000 |
| 9 | 6" PVC to Drywells | 300 | LF | $ 150 | $ 45,000 |
| 10 | Drywells | 14 | EA | $ 60,000 | $ 840,000 |
| 11 | Traffic Control and Restriping | 1 | LS | $ 25,000 | $ 25,000 |
| 12 | Site Restoration | 1 | LS | $ 25,000 | $ 25,000 |
| 13 | Pavement Restroration | 3,500 | SF | $ 7 | $ 24,500 |
| 14 | Mobilization/Demobilization | 1 | LS | $ 233,513 | $ 233,513 |
| 15 | Contingency @ 30% | 1 | LS | $ 487,725 | $ 487,725 |
|  |  |  |  | **Subtotal** | **$ 2,346,988** |
|  |  |  |  | *Planning and Permitting* | *$ 24,000* |
|  |  |  |  | *Engineering Design* | *$ 212,000* |
|  |  |  |  | *Construction Management* | *$ 235,000* |
|  |  |  |  | *Administration* | *$ 71,000* |
|  |  |  |  | **Total Estimate for MOL 3** | **$ 2,890,000** |
|  |  |  |  | **Cost per Drywell** | **$ 206,429** |

## MOL 4

| Item | Description | Qty | Unit | Unit Price | Total |
|---|---|---|---|---|---|
| 1 | Diversion Structure | 1 | LS | $ 65,000 | $ 65,000 |
| 2 | 20" PVC to Lift Station | 150 | LF | $ 400 | $ 60,000 |
| 3 | Lift Station | 1 | LS | $ 270,000 | $ 270,000 |
| 4 | 24" PVC to Pretreatment | 630 | LF | $ 300 | $ 189,000 |
| 5 | Pretreatment | 1 | LS | $ 102,000 | $ 102,000 |
| 6 | 20" PVC Distribution | 710 | LF | $ 300 | $ 213,000 |
| 7 | 18"x6" Double Y | 18 | EA | $ 6,000 | $ 108,000 |
| 8 | 6"x6" Y | 2 | EA | $ 250 | $ 500 |
| 9 | 6" PVC to Drywells | 2,610 | LF | $ 150 | $ 391,500 |
| 10 | Drywells | 39 | EA | $ 60,000 | $ 2,340,000 |
| 11 | Traffic Control and Restriping | 1 | LS | $ 25,000 | $ 25,000 |
| 12 | Site Restoration | 1 | LS | $ 35,000 | $ 35,000 |
| 13 | Pavement Restroration | 16,000 | SF | $ 7 | $ 112,000 |
| 14 | Mobilization/Demobilization | 1 | LS | $ 576,900 | $ 576,900 |
| 15 | Contingency @ 30% | 1 | LS | $ 1,173,300 | $ 1,173,300 |
|  |  |  |  | **Subtotal** | **$ 5,661,200** |
|  |  |  |  | *Planning and Permitting* | *$ 57,000* |
|  |  |  |  | *Engineering Design* | *$ 510,000* |
|  |  |  |  | *Construction Management* | *$ 567,000* |
|  |  |  |  | *Administration* | *$ 170,000* |
|  |  |  |  | **Total Estimate for MOL 4** | **$ 6,970,000** |
|  |  |  |  | **Cost per Drywell** | **$ 178,718** |

Metro Orange Line Water Infiltration and Cost Estaimte

## MOL 5

| Item | Description | Qty | Unit | Unit Price | Total |
|---|---|---|---|---|---|
| 1 | Diversion Structure | 1 | LS | $ 83,000 | $ 83,000 |
| 2 | 20" PVC to Lift Station | 110 | LF | $ 400 | $ 44,000 |
| 3 | Lift Station | 1 | LS | $ 211,000 | $ 211,000 |
| 4 | 20" PVC to Pretreatment | 35 | LF | $ 300 | $ 10,500 |
| 5 | Pretreatment | 1 | LS | $ 74,000 | $ 74,000 |
| 6 | 18" PVC Distribution | 460 | LF | $ 275 | $ 126,500 |
| 7 | 18"x6" Double Y | 6 | EA | $ 3,500 | $ 21,000 |
| 8 | 6" PVC to Drywells | 120 | LF | $ 150 | $ 18,000 |
| 9 | Drywells | 13 | EA | $ 60,000 | $ 780,000 |
| 10 | Traffic Control and Restriping | 1 | LS | $ 25,000 | $ 25,000 |
| 11 | Site Restoration | 1 | LS | $ 25,000 | $ 25,000 |
| 12 | Pavement Restroration | 3,000 | SF | $ 7 | $ 21,000 |
| 13 | Mobilization/Demobilization | 1 | LS | $ 215,850 | $ 215,850 |
| 14 | Contingency @ 30% | 1 | LS | $ 431,700 | $ 431,700 |
| | | | | **Subtotal** | **$ 2,086,550** |
| | | | | *Planning and Pemitting* | *$ 21,000* |
| | | | | *Engineering Design* | *$ 188,000* |
| | | | | *Construction Management* | *$ 209,000* |
| | | | | *Administration* | *$ 63,000* |
| | | | | **Total Estimate for MOL 5** | **$ 2,570,000** |
| | | | | **Cost per Drywell** | **$ 197,692** |

## MOL 6

| Item | Description | Qty | Unit | Unit Price | Total |
|---|---|---|---|---|---|
| 1 | Catch Basin | 2 | EA | $ 20,000 | $ 40,000 |
| 2 | 12" PVC to Pretreatment | 160 | LF | $ 225 | $ 36,000 |
| 3 | Pretreatment | 1 | LS | $ 66,000 | $ 66,000 |
| 4 | 12" PVC Distribution | 160 | LF | $ 200 | $ 32,000 |
| 5 | 12"x6" Double Y | 5 | EA | $ 3,500 | $ 17,500 |
| 6 | 6" PVC to Drywells | 160 | LF | $ 150 | $ 24,000 |
| 7 | Drywells | 10 | EA | $ 60,000 | $ 600,000 |
| 8 | Traffic Control and Restriping | 1 | LS | $ 25,000 | $ 25,000 |
| 9 | Site Restoration | 1 | LS | $ 25,000 | $ 25,000 |
| 10 | Pavement Restroration | 3,500 | SF | $ 7 | $ 24,500 |
| 11 | Mobilization/Demobilization | 1 | LS | $ 133,500 | $ 133,500 |
| 12 | Contingency @ 30% | 1 | LS | $ 267,000 | $ 267,000 |
| | | | | **Subtotal** | **$ 1,290,500** |
| | | | | *Planning and Pemitting* | *$ 13,000* |
| | | | | *Engineering Design* | *$ 117,000* |
| | | | | *Construction Management* | *$ 130,000* |
| | | | | *Administration* | *$ 39,000* |
| | | | | **Total Estimate for MOL 6** | **$ 1,590,000** |
| | | | | **Cost per Drywell** | **$ 159,000** |

## MOL 7

| Item | Description | Qty | Unit | Unit Price | Total |
|---|---|---|---|---|---|
| 1 | Diversion Structure | 2 | LS | $ 92,000 | $ 184,000 |
| 2 | 20" PVC to Lift Station | 135 | LF | $ 400 | $ 54,000 |
| 3 | Lift Station | 1 | LS | $ 285,000 | $ 285,000 |
| 4 | 20" PVC to Pretreatment | 110 | LF | $ 300 | $ 33,000 |
| 5 | Pretreatment | 1 | LS | $ 92,000 | $ 92,000 |
| 6 | 20" PVC Distribution | 540 | LF | $ 300 | $ 162,000 |
| 7 | 20"x6" Double Y | 12 | EA | $ 6,000 | $ 72,000 |
| 8 | 20"x6" Y | 4 | EA | $ 5,000 | $ 20,000 |
| 9 | 6" PVC to Drywells | 630 | LF | $ 150 | $ 94,500 |
| 10 | Drywells | 28 | EA | $ 60,000 | $ 1,680,000 |
| 11 | Traffic Control and Restriping | 1 | LS | $ 25,000 | $ 25,000 |
| 12 | Site Restoration | 1 | LS | $ 30,000 | $ 30,000 |
| 13 | Pavement Restroration | 5,500 | SF | $ 7 | $ 38,500 |
| 14 | Mobilization/Demobilization | 1 | LS | $ 387,900 | $ 387,900 |
| 15 | Contingency @ 30% | 1 | LS | $ 831,000 | $ 831,000 |
|  |  |  |  | **Subtotal** | **$ 3,988,900** |
|  |  |  |  | *Planning and Pemitting* | *$ 40,000* |
|  |  |  |  | *Engineering Design* | *$ 360,000* |
|  |  |  |  | *Construction Management* | *$ 399,000* |
|  |  |  |  | *Administration* | *$ 120,000* |
|  |  |  |  | **Total Estimate for MOL 7** | **$ 4,910,000** |
|  |  |  |  | **Cost per Drywell** | **$ 175,357** |

## Preliminary Cost Estimate - Site Summary

| Location | # of Drywells | Planning Cost | Engineering Design Cost | Construction Cost | Total Cost |
|---|---|---|---|---|---|
| MOL 1 | 24 | $ 33,000 | $ 289,000 | $ 3,628,000 | $ 3,950,000 |
| MOL 2 | 40 | $ 53,000 | $ 477,000 | $ 5,990,000 | $ 6,520,000 |
| MOL 3 | 14 | $ 24,000 | $ 212,000 | $ 2,654,000 | $ 2,890,000 |
| MOL 4 | 39 | $ 57,000 | $ 510,000 | $ 6,403,000 | $ 6,970,000 |
| MOL 5 | 13 | $ 21,000 | $ 188,000 | $ 2,361,000 | $ 2,570,000 |
| MOL 6 | 10 | $ 13,000 | $ 117,000 | $ 1,460,000 | $ 1,590,000 |
| MOL 7 | 28 | $ 40,000 | $ 360,000 | $ 4,510,000 | $ 4,910,000 |
| **Totals** | **168** | **$ 241,000** | **$ 2,153,000** | **$ 27,006,000** | **$ 29,400,000** |

Note:

1. Line items include material, labor and equipment usage costs
2. Contigency includes potential complications during the later permitting, site investigation, staging , and site access stages.
3. Construction cost includes constuction management and administration.

# ATTACHMENTS FOR SECTION 5.1:

## COMMUNITY INVESTMENT

Geosyntec consultants

engineers | scientists | innovators

Metro

# Flood Risk Mitigation Analysis

## Metro Orange Line Water Infiltration and Quality Project

# 1. INTRODUCTION AND MOEDEL DEVELOPMENT

To support the Metro Orange Line Water Infiltration and Quality Project (Project)'s community investment benefit in improving flood management, flood conveyance, or flood risk mitigation. A simplified hydrologic analysis was performed to determine the peak flow rate from a 2-year, 24-hour design storm event before and after Project implementation. The analyses were based on the Modified Rational Method ("MODRAT") per the Los Angeles County Hydrology Manual using the LA County Department of Public Works "HydroCalc Calculator". Required inputs for the HydroCalc Calculator include area, flow path length, flow path slope, imperviousness, and storm depth, which were determined as outlined below

- **Design Storm Depth**: Per the LA County's Hydrology Map[1], the 50-year 24-hour isohyet for the Site is 7.55 inches. According to the Los Angeles County Hydrology Manual, the isohyet reduction to convert a 50-year 24-hour storm event to a 2-year 24-hour storm event is 0.387. The resultant 10-year 24-hour isohyet for the Site was computed as 2.92 inches.

- **Soils Type**: The dominant soil type for each drainage area, obtained form LA County's Hydrology Map[1] was applied

- **Flow Path Length and Slope:** The flow path is defined as the longest distance between the most remote point within a subcatchment to the proposed stormwater conveyance feature. Both flow path length and slope determined by reviewing the contours and elevations provided in the Grading Plan. It should be noted that if a flow path has varying slopes, the maximum slope was used to produce a more conservative flow estimate

- **Site Area and Imperviousness:** Acreage and area-weighted imperviousness were computed using WMMS 2.0 database to maintain modelling consistency throughout this Project. Please refer to the hydrologic modelling attachment uploaded under the "Water Quality" section of this application for detailed description and exhibits on Project drainage area and imperviousness.

- **BMP Performance:** The peak flow reduction capacity of the proposed BMP was assumed to be equivalent to the maximum infiltration capacities. As discussed in the geotechnical PDF attachment uploaded in "Design- Elements - Site Condition" section of this application, a design infiltration rate of 0.8 cfs/drywell was calculated based on review of available boring log and Cone Penetration Test (CPT) data.

---

[1] https://dpw.lacounty.gov/wrd/hydrologygis/

## 2. RESULTS

Key inputs and results from the HydroCalc model are summarized in Table 1. All model input and output files are provided in Appendix A.

**Table 1. Summary of Model Key Inputs and Results (24-Hour 2-Year Design Storm)**

| **Key Modeling Input** | | | | |
|---|---|---|---|---|
| Design Storm Rainfall Total (inches) | | | | 1.1 |
| Total Number of Drywells Modeled | | | | 168 |
| Infiltration Capacity per Drywell (cfs) | | | | 0.8 |
| **Key Modeling Output** | | | | |
| **Drywell Cluster** | **Number of Drywells** | **Peak Discharge Rate – Existing Condition (cfs)** | **Peak Discharge Rate – Proposed Condition (cfs)** | **Peak Discharge Reduction (%)** |
| MOL-1 | 24 | 161 | 141 | 12% |
| MOL-2 | 40 | 364 | 332 | 9% |
| MOL-3 | 14 | 117 | 106 | 10% |
| MOL-4 | 39 | 309 | 278 | 10% |
| MOL-5 | 13 | 90 | 80 | 12% |
| MOL-6 | 10 | 38 | 30 | 21% |
| MOL-7 | 28 | 138 | 116 | 16% |

In summary, the proposed Project can reduce the peak discharge by at least 9% during a 24-hour 2-year design storm from the Project drainage area. Considering that the proposed Project is primarily designed for water quality and water supply benefits, the peak flow reduction capacity of the Project can provide additional flood risk mitigation benefit by reducing localized flooding risk at MOL-6, where street runoff will be directly diverted to the BMP, and restoring capacity of the drainage system at the remaining Project sites, where stormwater runoffs will be diverted from the existing storm drains.

# APPENDIX A

## HydroCalc Input and Output

# Peak Flow Hydrologic Analysis

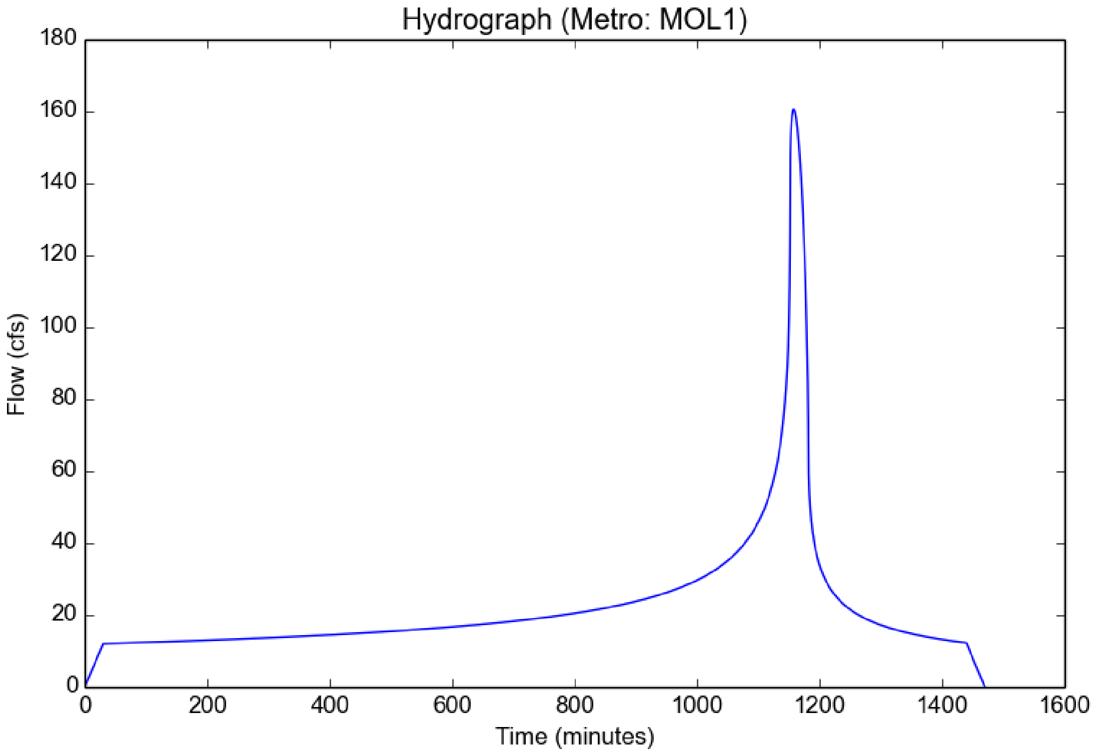
File location: P:/GIS/Metro FS LA0583005/Project/Hydrocalc_SWMM/Metro Report.pdf
Version: HydroCalc 1.0.3

## Input Parameters

| | |
|---|---|
| Project Name | Metro |
| Subarea ID | MOL1 |
| Area (ac) | 308.496592 |
| Flow Path Length (ft) | 8450.0 |
| Flow Path Slope (vft/hft) | 0.473372781 |
| 50-yr Rainfall Depth (in) | 7.55 |
| Percent Impervious | 0.625319781 |
| Soil Type | 5 |
| Design Storm Frequency | 2-yr |
| Fire Factor | 0 |
| LID | False |

## Output Results

| | |
|---|---|
| Modeled (2-yr) Rainfall Depth (in) | 2.9219 |
| Peak Intensity (in/hr) | 0.751 |
| Undeveloped Runoff Coefficient (Cu) | 0.3472 |
| Developed Runoff Coefficient (Cd) | 0.6929 |
| Time of Concentration (min) | 30.0 |
| Clear Peak Flow Rate (cfs) | 160.5201 |
| Burned Peak Flow Rate (cfs) | 160.5201 |
| 24-Hr Clear Runoff Volume (ac-ft) | 45.3232 |
| 24-Hr Clear Runoff Volume (cu-ft) | 1974278.2398 |



# Peak Flow Hydrologic Analysis

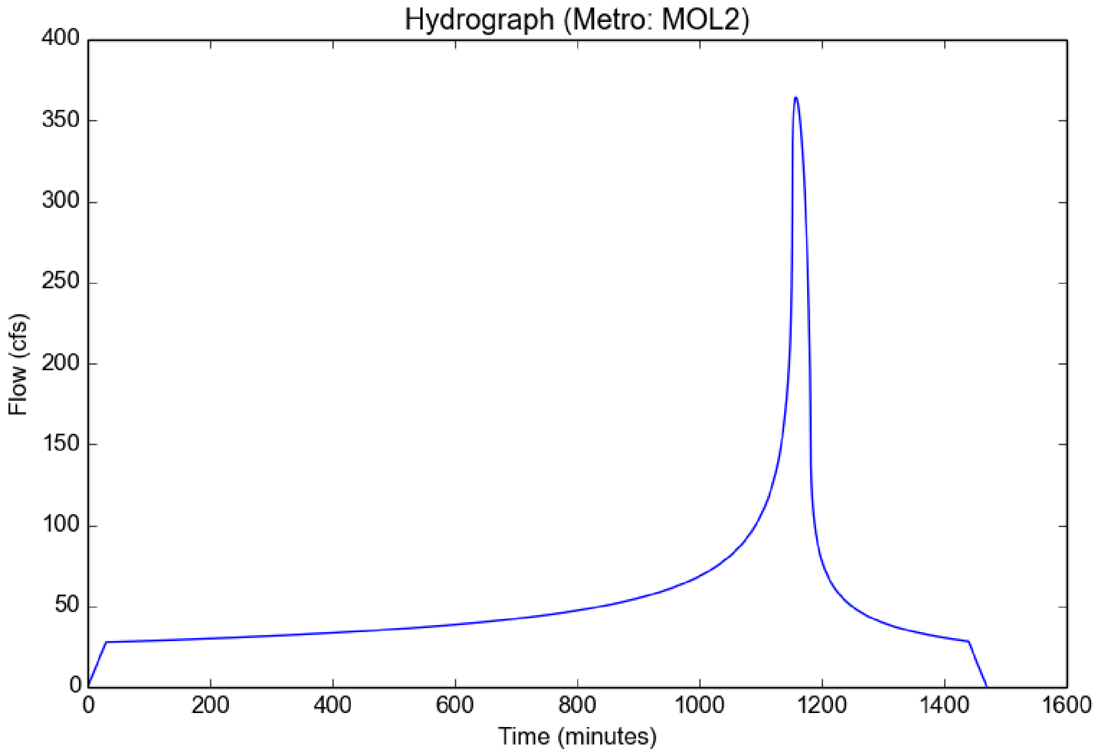
File location: P:/GIS/Metro FS LA0583005/Project/Hydrocalc_SWMM/Metro Report.pdf
Version: HydroCalc 1.0.3

## Input Parameters

| | |
|---|---|
| Project Name | Metro |
| Subarea ID | MOL2 |
| Area (ac) | 682.6383133 |
| Flow Path Length (ft) | 13400.0 |
| Flow Path Slope (vft/hft) | 0.559701493 |
| 50-yr Rainfall Depth (in) | 7.55 |
| Percent Impervious | 0.656980016 |
| Soil Type | 5 |
| Design Storm Frequency | 2-yr |
| Fire Factor | 0 |
| LID | False |

## Output Results

| | |
|---|---|
| Modeled (2-yr) Rainfall Depth (in) | 2.9219 |
| Peak Intensity (in/hr) | 0.751 |
| Undeveloped Runoff Coefficient (Cu) | 0.3472 |
| Developed Runoff Coefficient (Cd) | 0.7104 |
| Time of Concentration (min) | 30.0 |
| Clear Peak Flow Rate (cfs) | 364.1701 |
| Burned Peak Flow Rate (cfs) | 364.1701 |
| 24-Hr Clear Runoff Volume (ac-ft) | 104.3524 |
| 24-Hr Clear Runoff Volume (cu-ft) | 4545589.3228 |



# Peak Flow Hydrologic Analysis

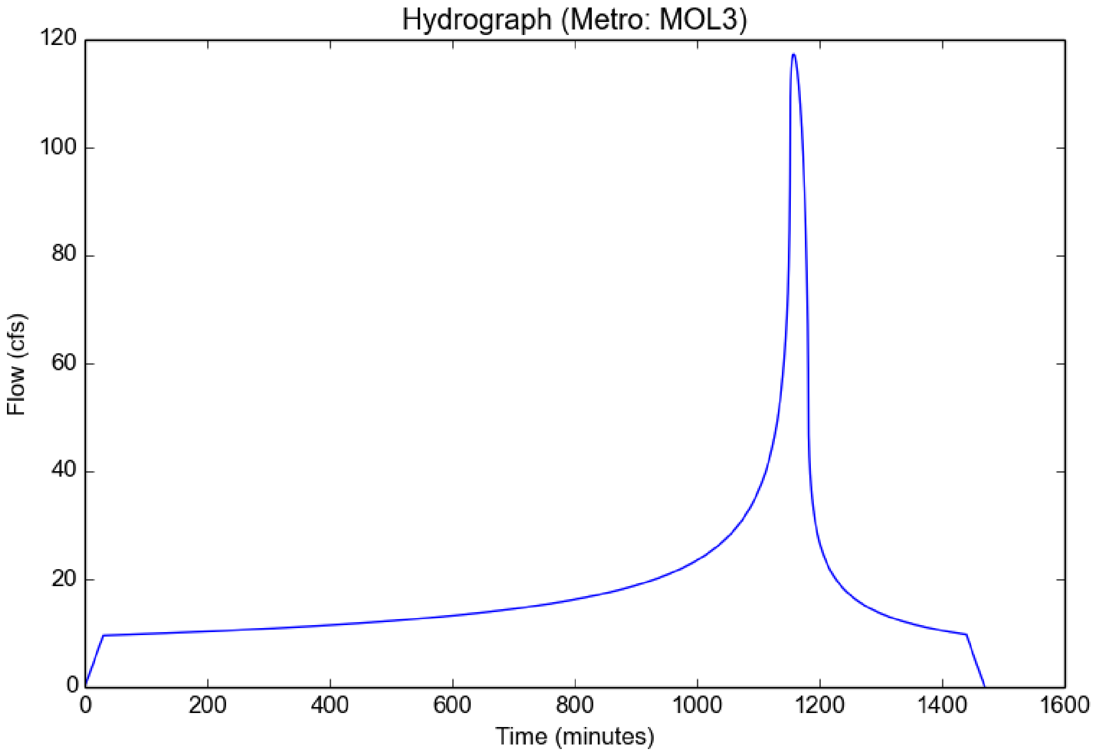
File location: P:/GIS/Metro FS LA0583005/Project/Hydrocalc_SWMM/Metro Report.pdf
Version: HydroCalc 1.0.3

## Input Parameters

| | |
|---|---|
| Project Name | Metro |
| Subarea ID | MOL3 |
| Area (ac) | 197.3397745 |
| Flow Path Length (ft) | 9900.0 |
| Flow Path Slope (vft/hft) | 0.595959596 |
| 50-yr Rainfall Depth (in) | 7.55 |
| Percent Impervious | 0.803537472 |
| Soil Type | 5 |
| Design Storm Frequency | 2-yr |
| Fire Factor | 0 |
| LID | False |

## Output Results

| | |
|---|---|
| Modeled (2-yr) Rainfall Depth (in) | 2.9219 |
| Peak Intensity (in/hr) | 0.751 |
| Undeveloped Runoff Coefficient (Cu) | 0.3472 |
| Developed Runoff Coefficient (Cd) | 0.7914 |
| Time of Concentration (min) | 30.0 |
| Clear Peak Flow Rate (cfs) | 117.283 |
| Burned Peak Flow Rate (cfs) | 117.283 |
| 24-Hr Clear Runoff Volume (ac-ft) | 35.6018 |
| 24-Hr Clear Runoff Volume (cu-ft) | 1550816.51 |



# Peak Flow Hydrologic Analysis

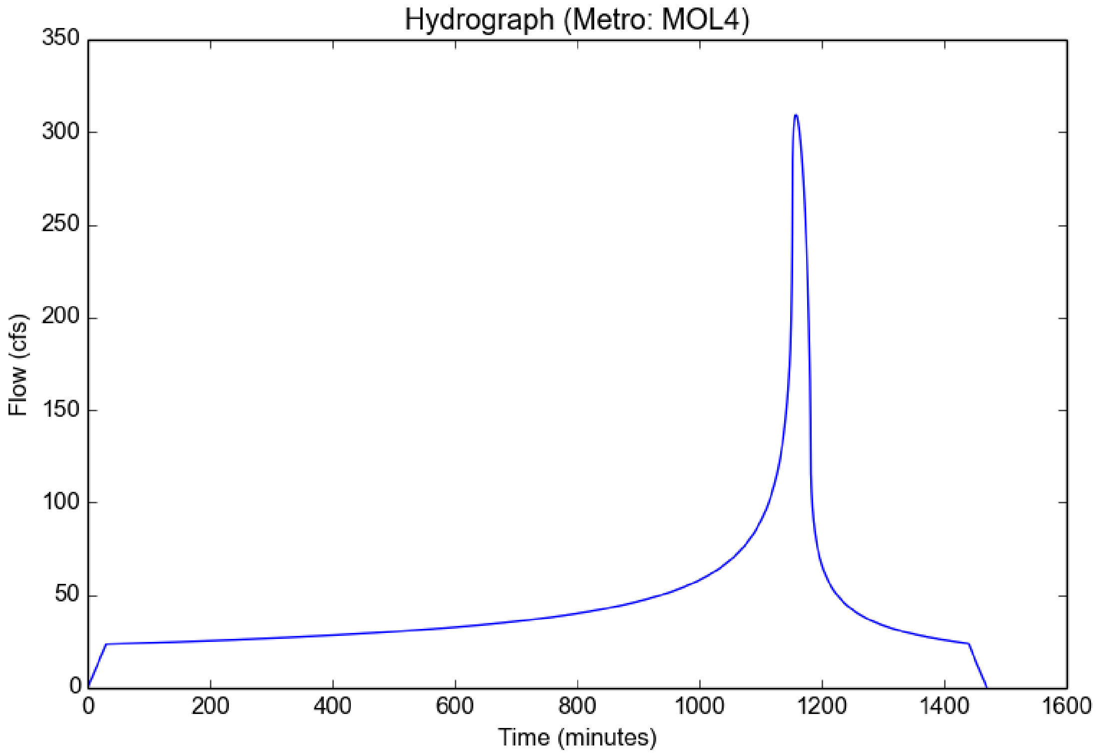
File location: P:/GIS/Metro FS LA0583005/Project/Hydrocalc_SWMM/Metro Report.pdf
Version: HydroCalc 1.0.3

## Input Parameters

| | |
|---|---|
| Project Name | Metro |
| Subarea ID | MOL4 |
| Area (ac) | 578.7433969 |
| Flow Path Length (ft) | 13400.0 |
| Flow Path Slope (vft/hft) | 0.447761194 |
| 50-yr Rainfall Depth (in) | 7.55 |
| Percent Impervious | 0.659527471 |
| Soil Type | 5 |
| Design Storm Frequency | 2-yr |
| Fire Factor | 0 |
| LID | False |

## Output Results

| | |
|---|---|
| Modeled (2-yr) Rainfall Depth (in) | 2.9219 |
| Peak Intensity (in/hr) | 0.751 |
| Undeveloped Runoff Coefficient (Cu) | 0.3472 |
| Developed Runoff Coefficient (Cd) | 0.7118 |
| Time of Concentration (min) | 30.0 |
| Clear Peak Flow Rate (cfs) | 309.3569 |
| Burned Peak Flow Rate (cfs) | 309.3569 |
| 24-Hr Clear Runoff Volume (ac-ft) | 88.7474 |
| 24-Hr Clear Runoff Volume (cu-ft) | 3865837.3508 |



# Peak Flow Hydrologic Analysis

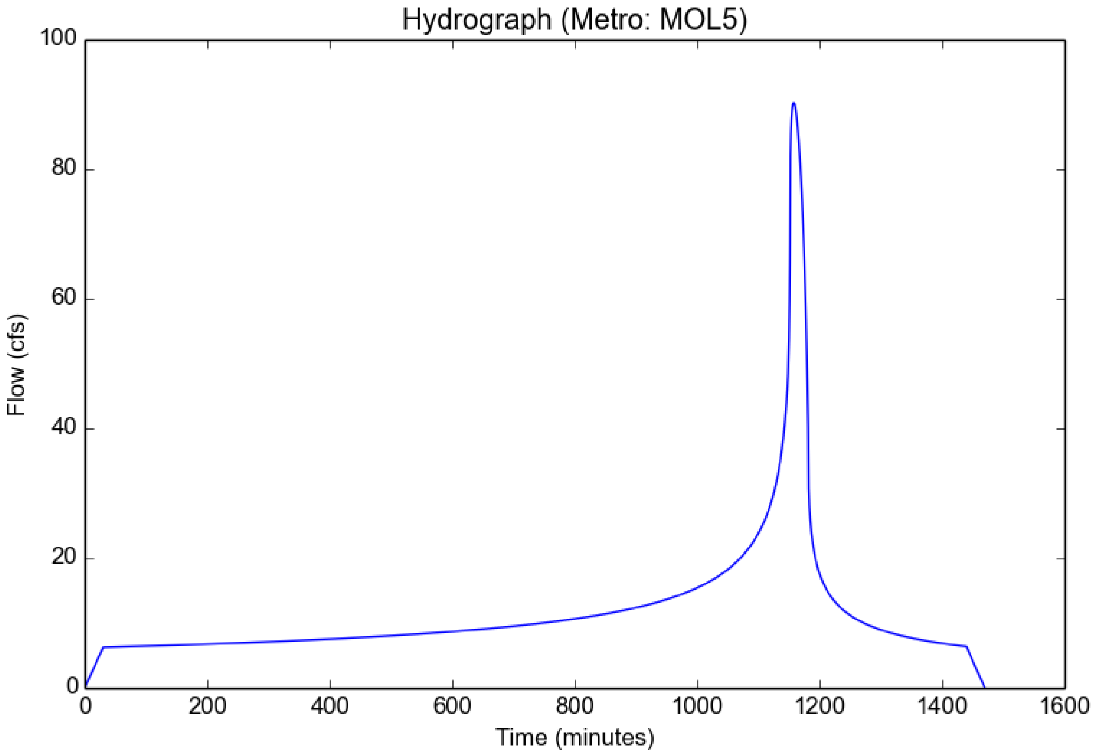
File location: P:/GIS/Metro FS LA0583005/Project/Hydrocalc_SWMM/Metro Report.pdf
Version: HydroCalc 1.0.3

## Input Parameters

| | |
|---|---|
| Project Name | Metro |
| Subarea ID | MOL5 |
| Area (ac) | 192.8286561 |
| Flow Path Length (ft) | 5687.0 |
| Flow Path Slope (vft/hft) | 0.492350976 |
| 50-yr Rainfall Depth (in) | 7.55 |
| Percent Impervious | 0.499230856 |
| Soil Type | 5 |
| Design Storm Frequency | 2-yr |
| Fire Factor | 0 |
| LID | False |

## Output Results

| | |
|---|---|
| Modeled (2-yr) Rainfall Depth (in) | 2.9219 |
| Peak Intensity (in/hr) | 0.751 |
| Undeveloped Runoff Coefficient (Cu) | 0.3472 |
| Developed Runoff Coefficient (Cd) | 0.6232 |
| Time of Concentration (min) | 30.0 |
| Clear Peak Flow Rate (cfs) | 90.2404 |
| Burned Peak Flow Rate (cfs) | 90.2404 |
| 24-Hr Clear Runoff Volume (ac-ft) | 23.7604 |
| 24-Hr Clear Runoff Volume (cu-ft) | 1035004.0133 |



# Peak Flow Hydrologic Analysis

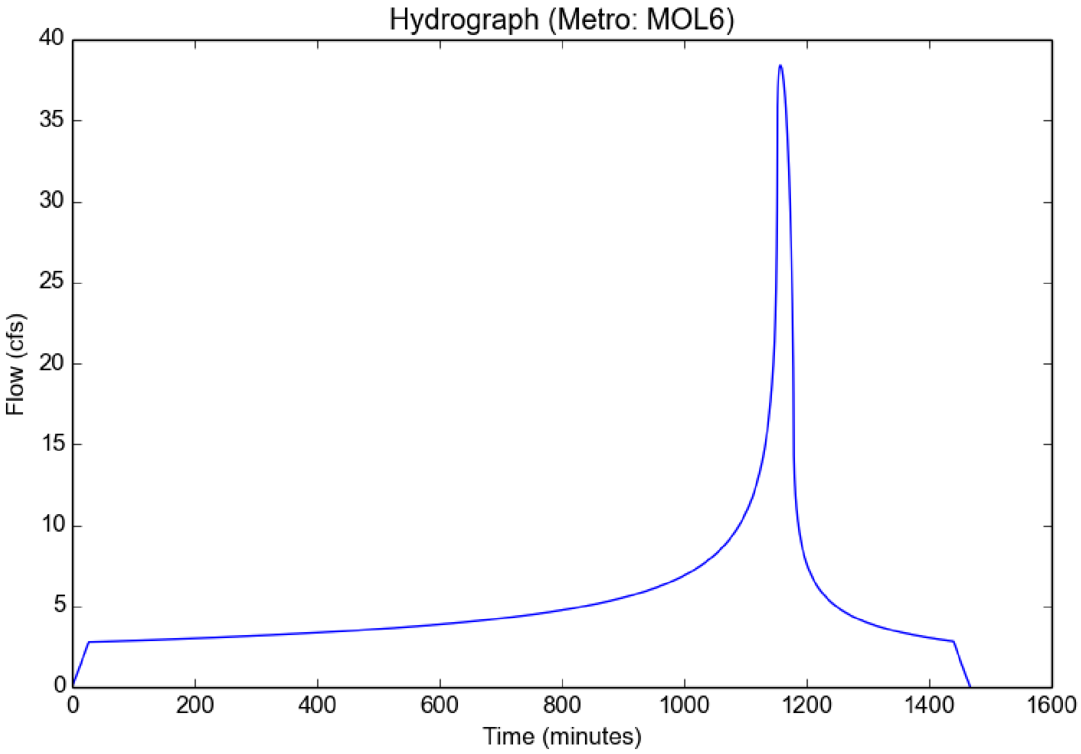
File location: P:/GIS/Metro FS LA0583005/Project/Hydrocalc_SWMM/Metro Report.pdf
Version: HydroCalc 1.0.3

## Input Parameters

| | |
|---|---|
| Project Name | Metro |
| Subarea ID | MOL6 |
| Area (ac) | 67.21583708 |
| Flow Path Length (ft) | 4900.0 |
| Flow Path Slope (vft/hft) | 0.632653061 |
| 50-yr Rainfall Depth (in) | 7.55 |
| Percent Impervious | 0.671505367 |
| Soil Type | 5 |
| Design Storm Frequency | 2-yr |
| Fire Factor | 0 |
| LID | False |

## Output Results

| | |
|---|---|
| Modeled (2-yr) Rainfall Depth (in) | 2.9219 |
| Peak Intensity (in/hr) | 0.7891 |
| Undeveloped Runoff Coefficient (Cu) | 0.3644 |
| Developed Runoff Coefficient (Cd) | 0.724 |
| Time of Concentration (min) | 27.0 |
| Clear Peak Flow Rate (cfs) | 38.4038 |
| Burned Peak Flow Rate (cfs) | 38.4038 |
| 24-Hr Clear Runoff Volume (ac-ft) | 10.4691 |
| 24-Hr Clear Runoff Volume (cu-ft) | 456031.8613 |



# Peak Flow Hydrologic Analysis

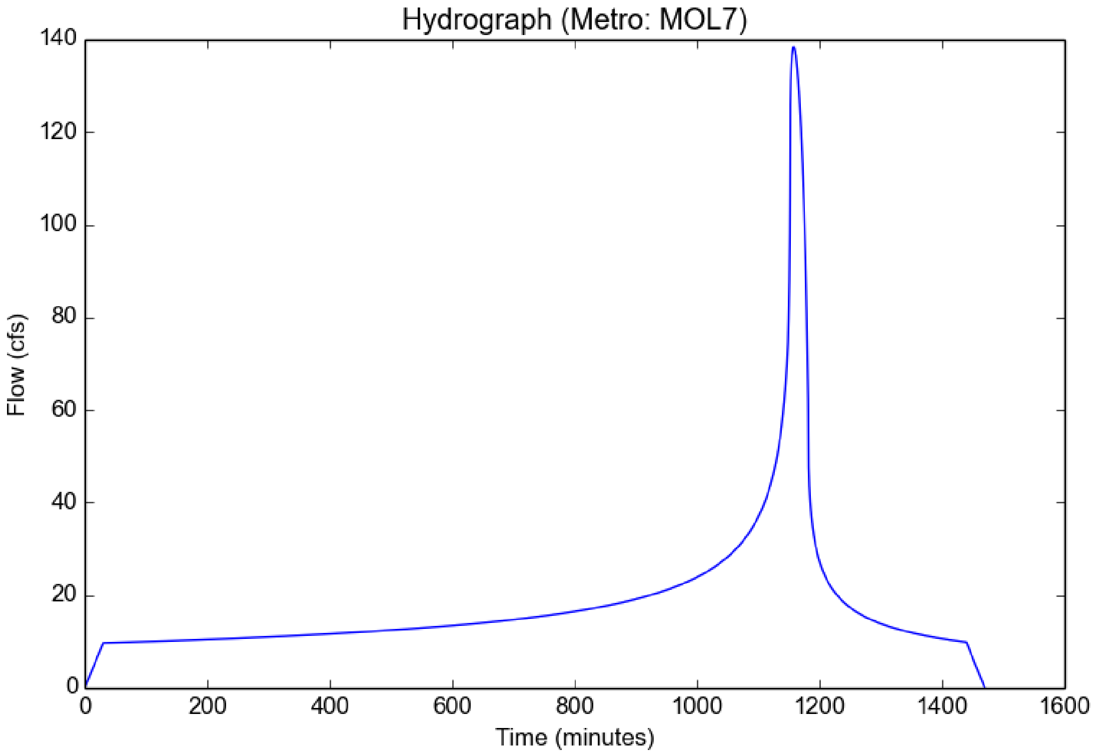
File location: P:/GIS/Metro FS LA0583005/Project/Hydrocalc_SWMM/Metro Report.pdf
Version: HydroCalc 1.0.3

## Input Parameters

| | |
|---|---|
| Project Name | Metro |
| Subarea ID | MOL7 |
| Area (ac) | 291.6933542 |
| Flow Path Length (ft) | 7200.0 |
| Flow Path Slope (vft/hft) | 0.472222222 |
| 50-yr Rainfall Depth (in) | 7.55 |
| Percent Impervious | 0.514436869 |
| Soil Type | 5 |
| Design Storm Frequency | 2-yr |
| Fire Factor | 0 |
| LID | False |

## Output Results

| | |
|---|---|
| Modeled (2-yr) Rainfall Depth (in) | 2.9219 |
| Peak Intensity (in/hr) | 0.751 |
| Undeveloped Runoff Coefficient (Cu) | 0.3472 |
| Developed Runoff Coefficient (Cd) | 0.6316 |
| Time of Concentration (min) | 30.0 |
| Clear Peak Flow Rate (cfs) | 138.3488 |
| Burned Peak Flow Rate (cfs) | 138.3488 |
| 24-Hr Clear Runoff Volume (ac-ft) | 36.7761 |
| 24-Hr Clear Runoff Volume (cu-ft) | 1601968.3957 |



# Next stop: Orange Line Improvements.

## Orange Line BRT Improvements
## Community Open House Meetings

**March 26 and 27, 2019**

Metro

# Measure M Transit Projects in San Fernando Valley

# Measure M
# Transit Projects Schedule

| Project | Expected Opening Date (3 year range) |
|---|---|
| **Orange Line BRT Improvements** | **FY 2025-27** |
| **North SFV BRT Improvements** | FY 2023-25 |
| **North Hollywood to Pasadena Corridor BRT** | FY 2022-24 |
| **East SFV Transit Corridor - Van Nuys Blvd.** | FY 2027-29 |
| **Sepulveda Transit Corridor (two phases)** | Phase 1 FY2026-28<br>Phase 2 FY2033-35 |
| **Orange Line Conversion to Rail** | FY 2057 |

# Project Funding

- **Phase 1: BRT Improvements**
  - Measure M and SB-1 Local Partnership Grant Program: $361 million
  - Groundbreaking: Oct. 2018
  - Opening: Winter 2024/25
- **Phase 2: BRT Conversion to LRT**
  - Measure M: $1.4 billion
  - Groundbreaking: 2051

Oct. 2018 Groundbreaking Ceremony at Sepulveda Park & Ride

# Timeline and Process

**BOARD APPROVED TECHNICAL STUDY FINDINGS & RECOMMENDATIONS & PROJECT DEVELOPMENT**
OCT 2017

**INITIATE TRAFFIC STUDY, PILOT GATE, & CONCEPTUAL ENGINEERING**
DEC 2017

**BOARD APPROVED UPDATED PROJECT DESCRIPTION**
**CEQA STATUTORY EXEMPTION**
JULY 2018

**GROUND-BREAKING**
**INITIATE AUR**
**CONTINUE TRAFFIC STUDY, PILOT GATE, & CE**
OCT 2018

**ONGOING TRAFFIC STUDY, PILOT GATE, AUR**
**INITIATE PE & ROW**
**COMMUNITY MEETINGS**
2019

WE ARE HERE

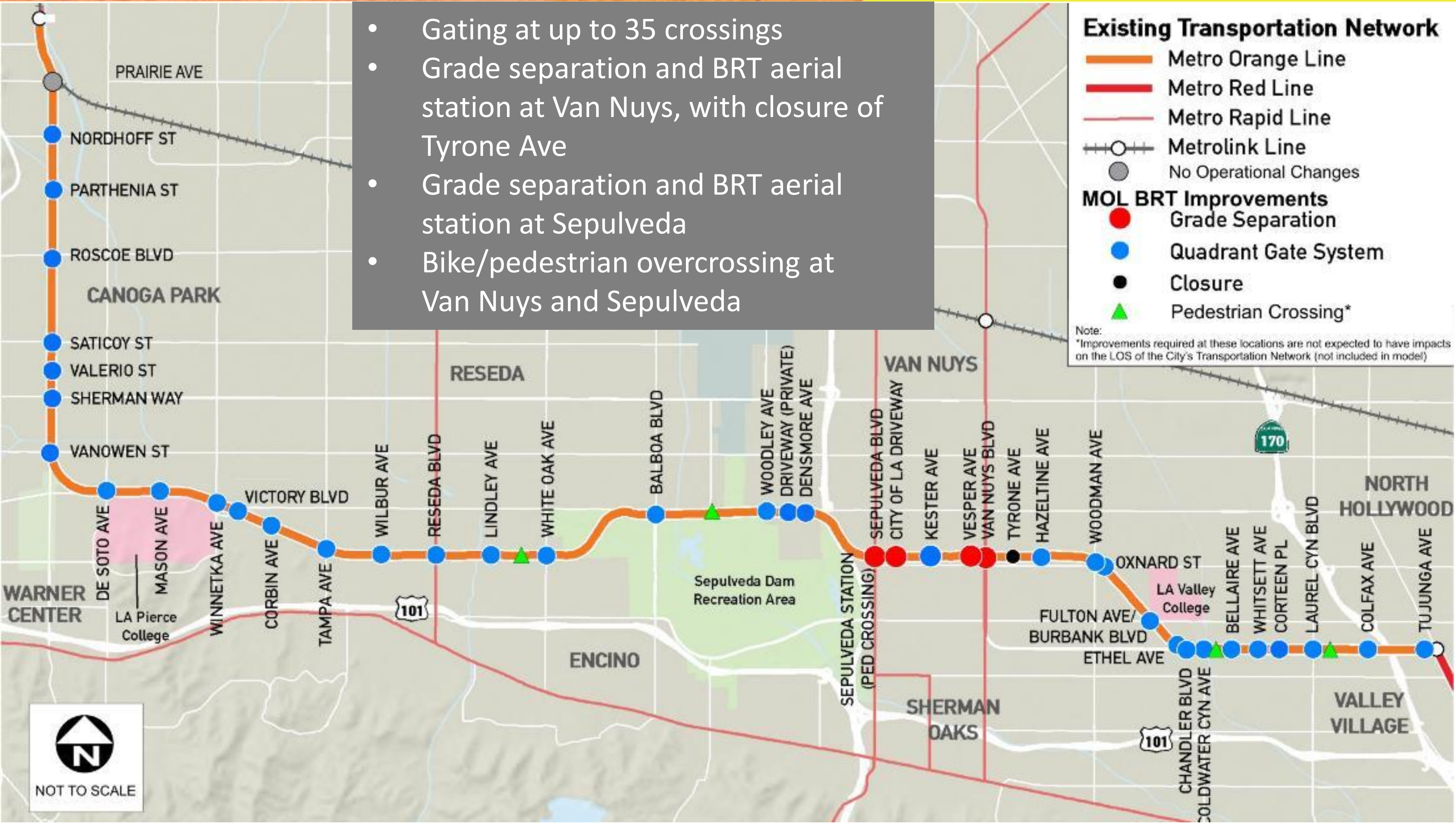
**FINAL DESIGN**
**AUR**
**ROW ACQUISITIONS**
**CONSTRUCTION**
2020-2024

**ONGOING PUBLIC OUTREACH**

AUR = Advanced Utility Relocation
CEQA = California Environmental Quality Act
CE = Conceptual Engineering
PE = Preliminary Engineering
ROW = Right-of-Way Property Acquisition Process
*(Timeline Subject to Change)*

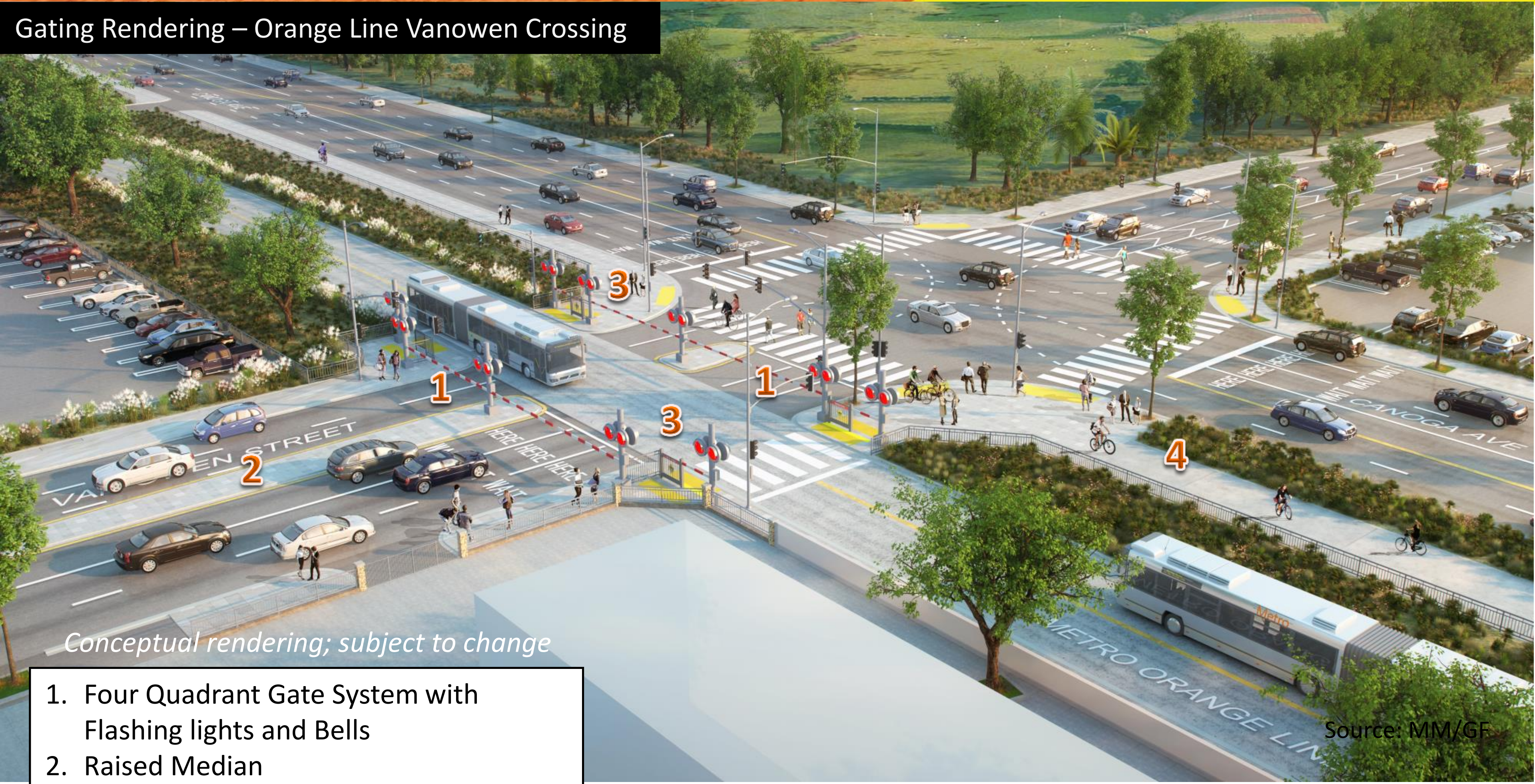
# Orange Line BRT Improvements

- Gating at up to 35 crossings
- Grade separation and BRT aerial station at Van Nuys, with closure of Tyrone Ave
- Grade separation and BRT aerial station at Sepulveda
- Bike/pedestrian overcrossing at Van Nuys and Sepulveda



# Gate Systems

Gating Rendering – Orange Line Vanowen Crossing



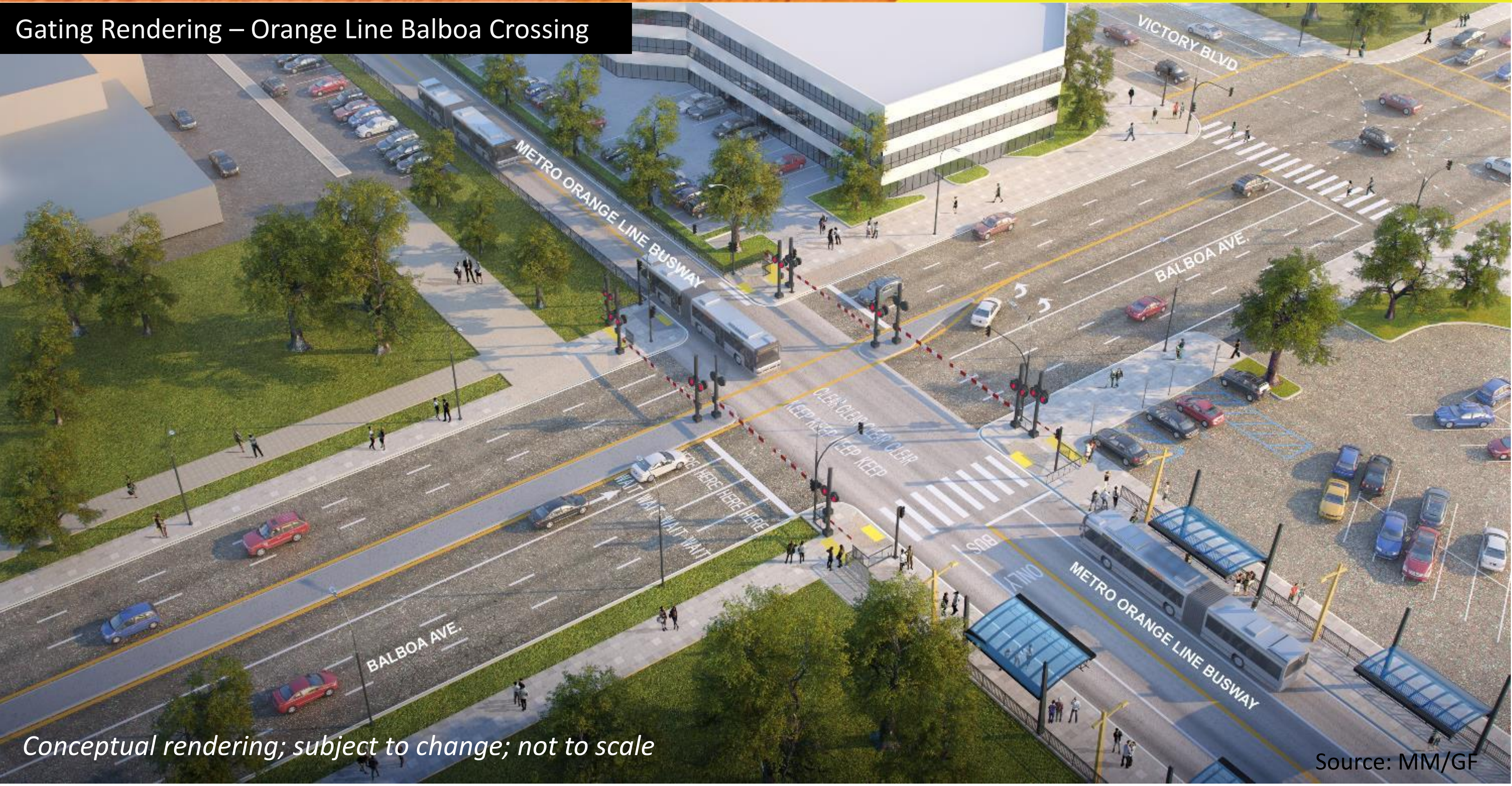
*Conceptual rendering; subject to change*

Source: MM/GF

1. Four Quadrant Gate System with Flashing lights and Bells
2. Raised Median
3. Pedestrian/Bicyclist Crosswalk Gates
4. Bike/Ped Path

# Bus Operations with Gates

Gating Rendering – Orange Line Balboa Crossing



*Conceptual rendering; subject to change; not to scale*

Source: MM/GF

# Grade Separations (GS)

## Project Elements:

- GS and aerial station at Sepulveda Blvd
- GS and aerial station at Van Nuys, with closure of Tyrone Ave
- Bike/pedestrian path grade separation at Van Nuys and Sepulveda
- Connectivity with Sepulveda and East San Fernando Valley Transit Projects

*Conceptual rendering; subject to change; not to scale*

Source: MM/GF

MOL - Sepulveda Grade Separation Rendering

# Grade Separations (GS)

**Aerial Station Design Features:**

- ➢ Side Platforms. 42’ Busway (3-14’ wide Bus lanes)
- ➢ 1 escalator, 1 set of stairs, 2 elevators, and provision for a future second escalator at all 4 corners
- ➢ Designed for future conversion to LRT
- ➢ Elevated bike path on the north side of elevated busway. Bike Parking at Plaza Level
- ➢ Artwork

*Conceptual rendering; subject to change; not to scale*

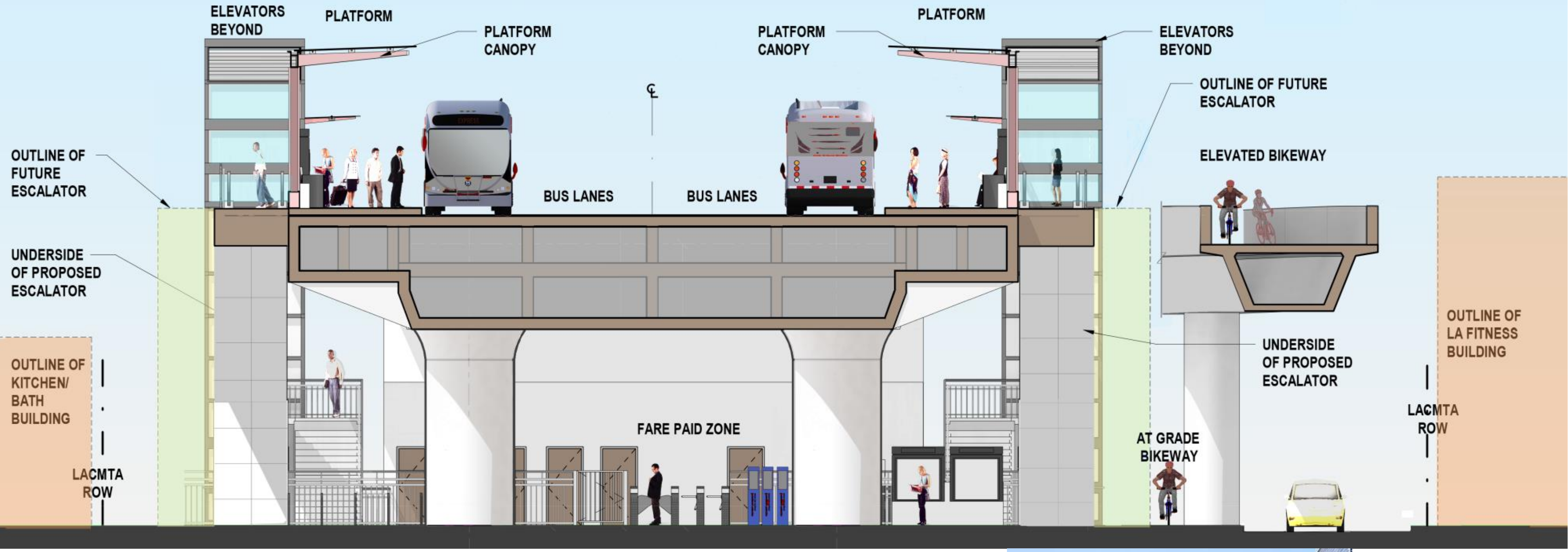
Source: MM/GF

MOL - Sepulveda Grade Separation Rendering

# Elevated Bike Path at Sepulveda and Van Nuys Crossings

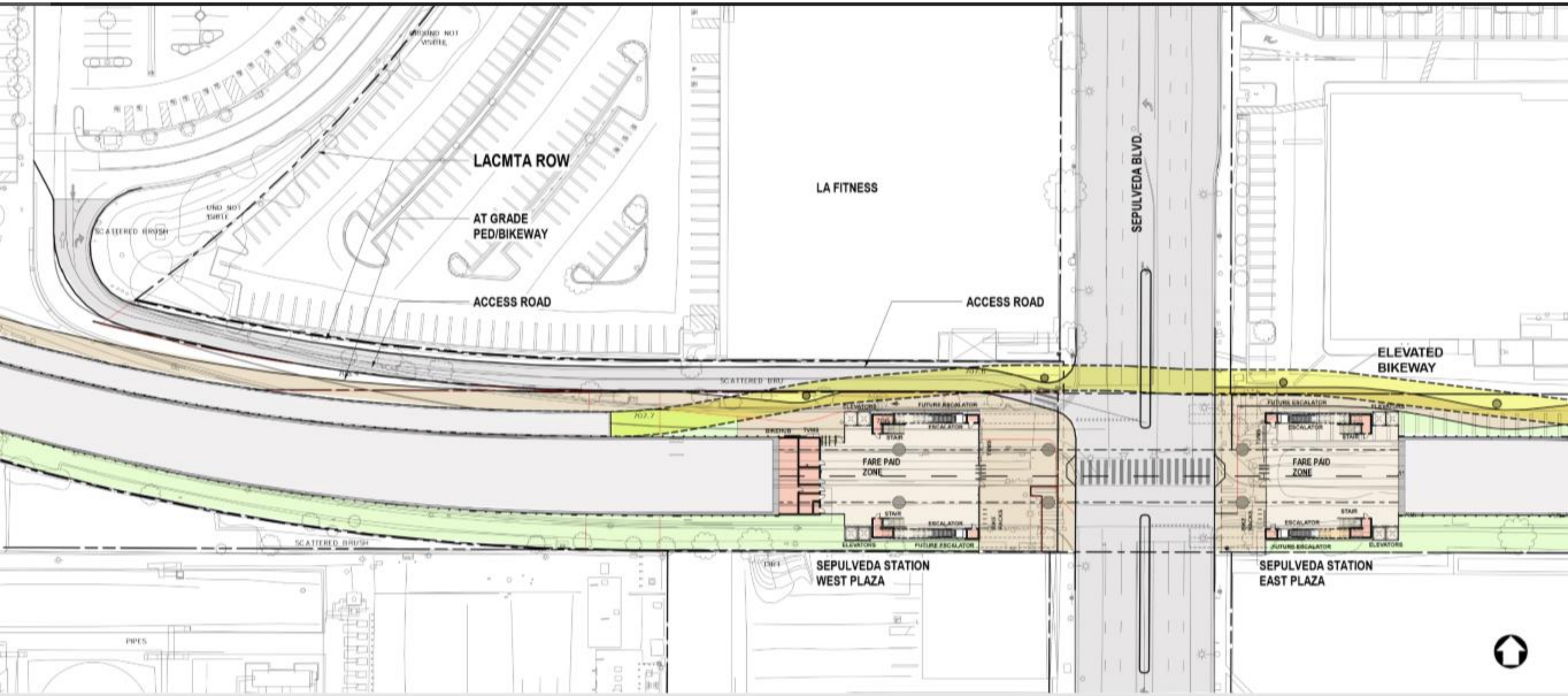
*Conceptual rendering; subject to change; not to scale*

Source: MM/GF



MOL - Elevated Bike Path at LA River

# Elevated Bike Path at Sepulveda Crossing



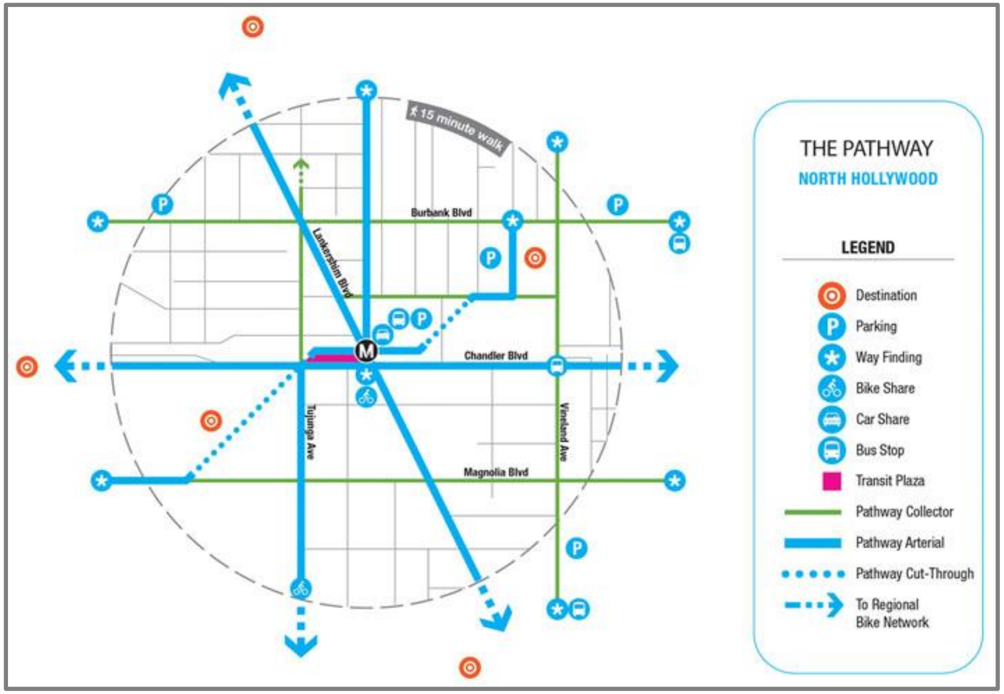
*Conceptual rendering; subject to change; not to scale*

Metro

# Pedestrian & Bicycle Access

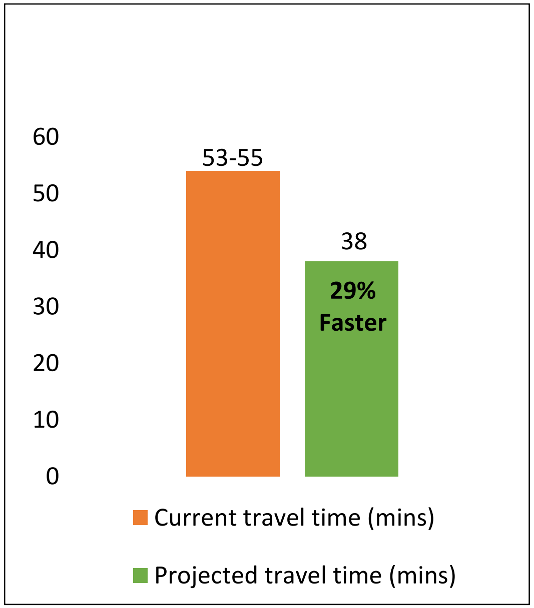
## First/Last Mile Component:

- Most riders access Metro stations without a car
- Study to identify key access routes and plan specific improvements for pedestrians and bicycle riders



# Project Benefits

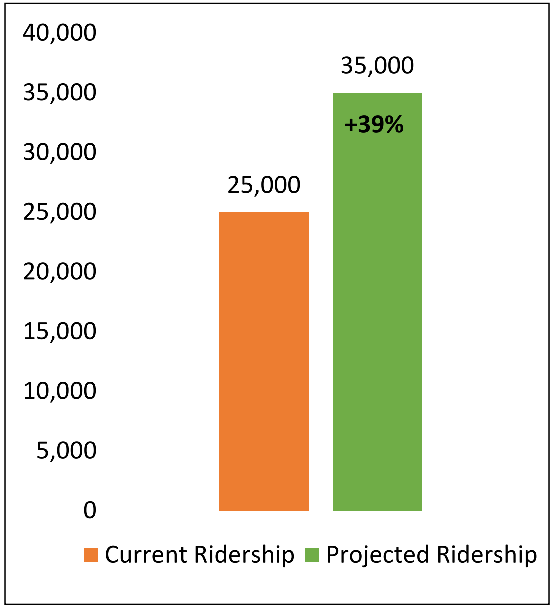
**MAXIMUM BUS TRAVEL TIME SAVINGS**



BRT Simulated Test Run with Gate Timing: March 3, 2019

# Project Benefits

## IMPROVED RIDERSHIP & CAPACITY



Metro

# Project Benefits

| Improvement / Benefit | Existing Conditions (North Hollywood to Chatsworth) | Gates + Grade Separations at Van Nuys and Sepulveda |
|---|---|---|
| IMPROVED SAFETY | ➢ Right-turn-on-red violations<br>• 5,000 – 6,000 monthly violations in 2018<br>➢ Collisions<br>• 24 collisions in 2018 | ➢ Avoids right-turn-on-red violations<br>➢ Reduces the risk of collisions |

*Conceptual rendering; subject to change; not to scale*

Source: MM/GF

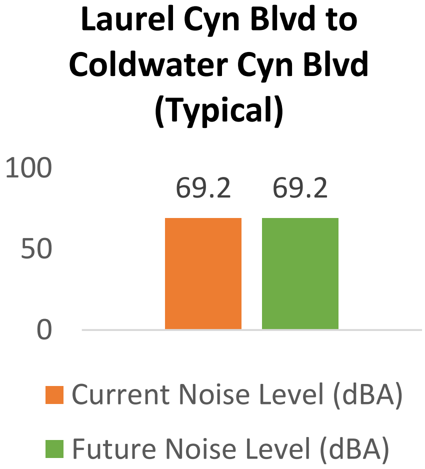
# Zero Emission Buses

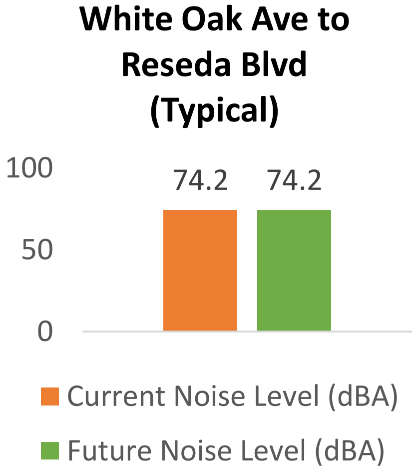
- **45 new battery electric buses**
- **Benefits:**
  - No tailpipe emissions
  - Quieter operation
  - Electric drive motors
  - Electric accessories
  - Better performance
  - Better ride quality

Metro

# Noise Study Results

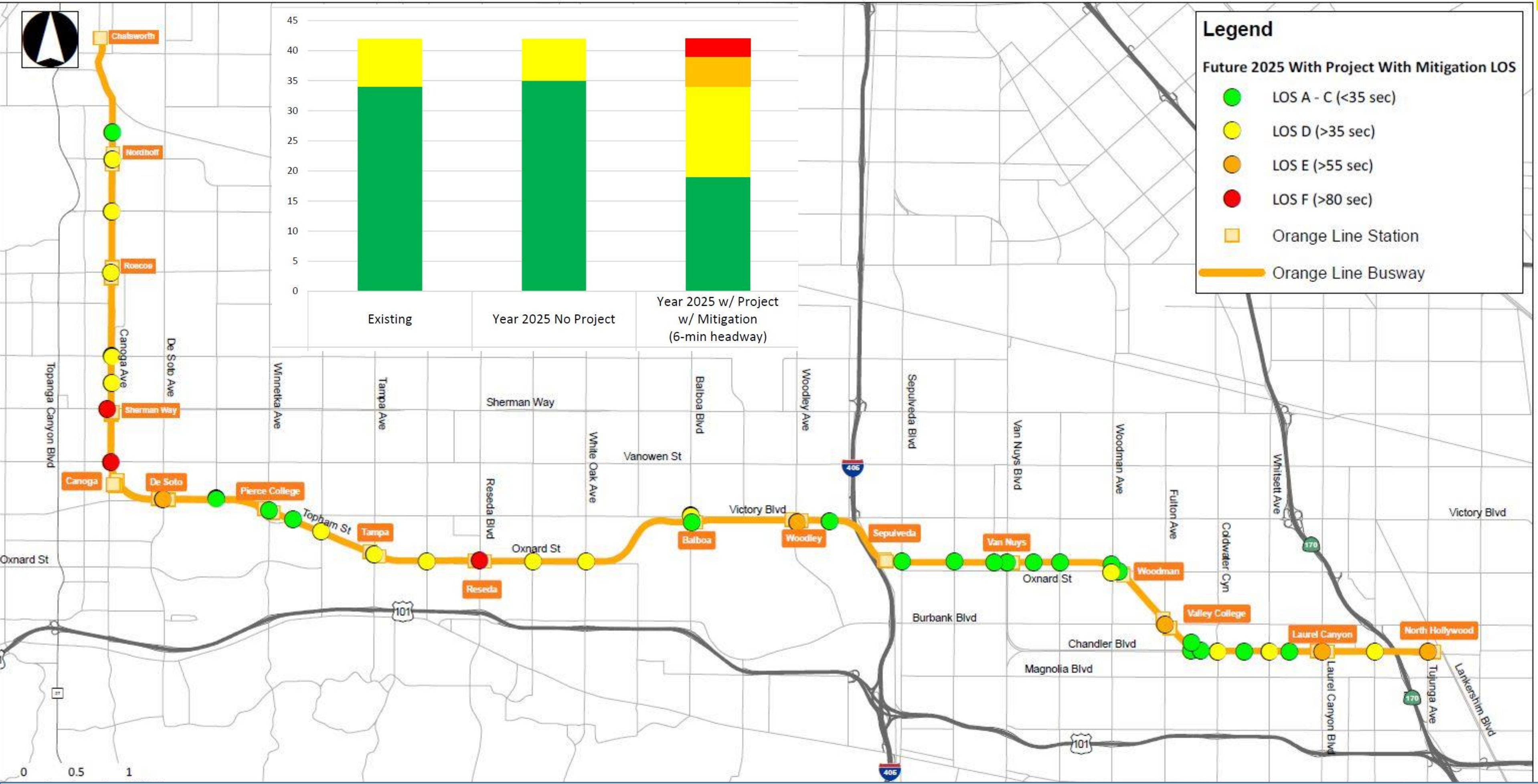
Quieter electric buses offset the noise introduced by the gate warning bells. Plans to run two bus ‘platoons’ to increase capacity during rush hour reduces the number of times the bells would be triggered.





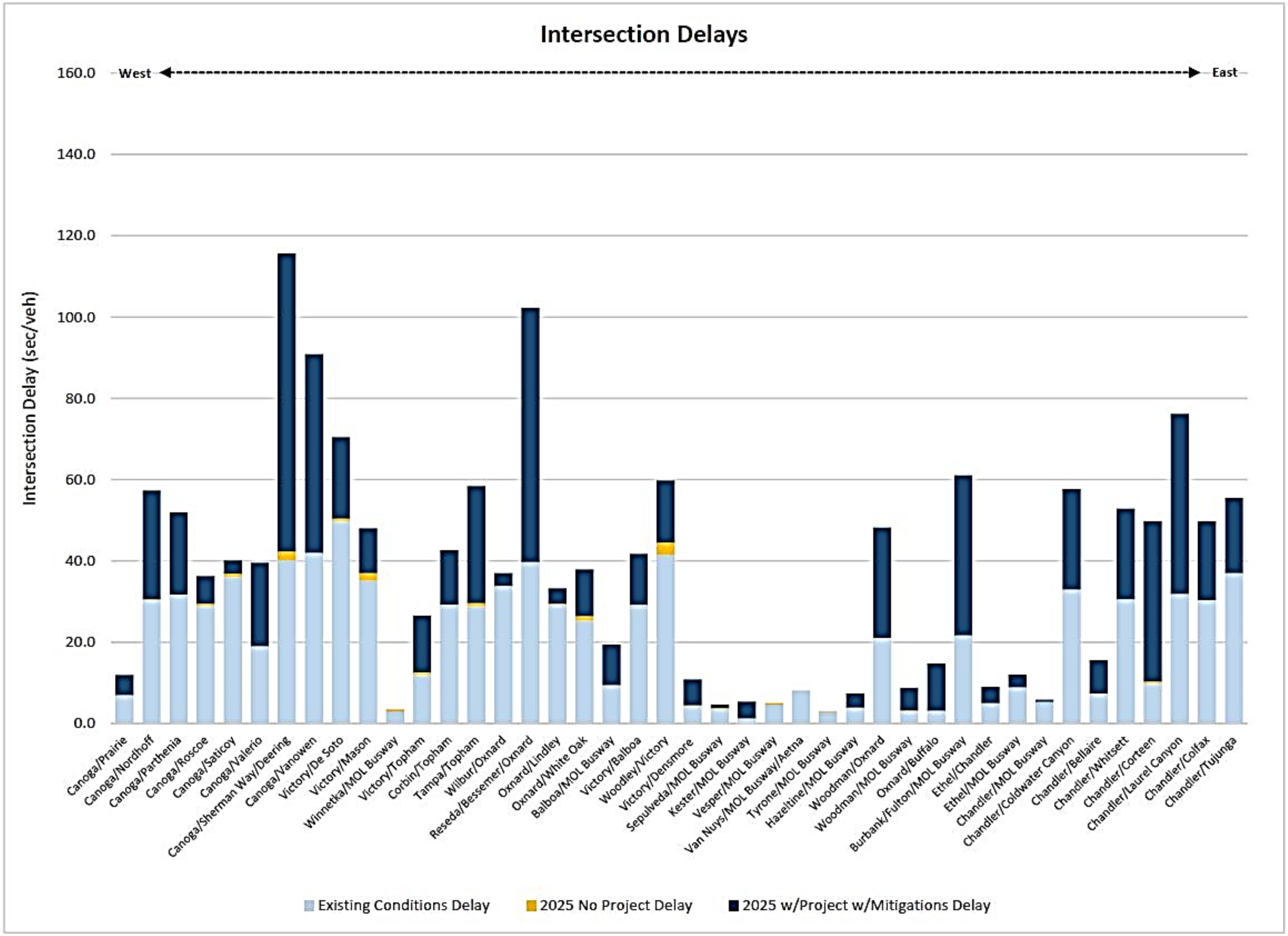
Metro

# 2025 Traffic Analysis Results
# 6-minute headways (PM Peak Hr)



- **23 of 42 analyzed intersections are significantly impacted by the Project, per LADOT “significant” traffic impact thresholds**
- **34 intersections (81%) are projected to operate at LOS D or better**
- **8 Intersections at LOS E/F.**

# Existing Plus Project-related Overall Intersection Delay Increase (PM Peak Hr)



# Mitigation Measures

- Signal Phasing Modifications
- Street Reconfigurations
- Additional mitigation measures to be considered based on:
  - Pilot gates
  - Innovative technology for gate activation system
  - Bus platooning options

*Conceptual rendering; subject to change; not to scale* Source: MM/GF

Gating Rendering – Orange Line De Soto Crossing

# Community Outreach

- Community Open House Meetings
  - **March 26, 2019, 7:30 - 10:00am**
    **Rose Goldwater Community Center**
    21710 Vanowen St.
    Canoga Park, CA 91303
  - **March 27, 2019, 4:30 – 7:00pm**
    **North Hollywood Senior Center**
    5301 Tujunga Ave
    North Hollywood, CA 91601
- San Fernando Valley Service Council Presentation
  - April 3rd
- Pop-up events at MOL stations
- Metro Real Estate ongoing property owner/tenant contact

# Q&A

Metro

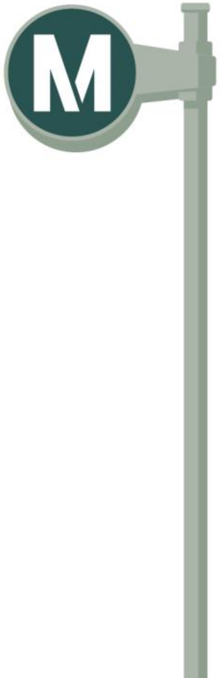
# We Want to Hear From You

✉ Fulgene Asuncion
Project Manager, Metro
One Gateway Plaza, 99-22-4
Los Angeles, CA 90012

☎ 888.316.3889

✉ orangeline@metro.net

🌐 metro.net/orangeline



Metro

# Thank You!

Metro

# ATTACHMENTS FOR SECTION 5.2:

## LOCAL SUPPORT

Climate
Resolve

Innovate. Advocate. Achieve. **Together.**

RE: Clean, Safe Drinking Water Program FY 21-22 – Metro Orange Line (MOL) Water Infiltration and Quality Project

To whom it may concern,

I am pleased to submit this letter of support for the Los Angeles County Metropolitan Transportation Authority (LA Metro) and Los Angeles Department of Water and Power proposal for the Safe, Clean Water Program.

The Metro Orange Line Water Infiltration and Quality Project (Project) proposes to implement 168 drywells across seven locations along the MOL with pretreatment facilities to capture, treat, and infiltrate stormwater runoff from 2,300 acres, resulting in an estimated groundwater recharge yield between 780 and 1,050 acre-feet/ year into the San Fernando Groundwater Basin. LA Metro's extensive land holdings and fortuitous siting within the highest value groundwater recharge areas within the region would allow for large-scale infiltration and aquifer recharge and has the potential to capture enough stormwater to allow Metro to become net water positive.

The Project will be integrated and developed as part of the MOL Bus Rapid Transit Improvements Project, which will increase bus speeds by 29%, improve ridership by 39%, and enhance safety. LA Metro is also in the process of fully electrifying their MOL bus fleet with zero emission electric buses.

Metro has been receptive to community feedback, which called for educational signage about the water supply benefits of this drywell project as well as workforce development for the maintenance of these drywells. Metro will be overseeing a large portfolio of capital infrastructure projects in the years ahead. Funding this project will encourage Metro to continue to think about maximizing multi-benefits through green infrastructure as it leaves its imprints on the region.

Thank you for your consideration of my support. Should you have any questions regarding my support, you may contact me at blindblad@climateresolve.org / 213-634-3790 x102.

Sincerely,

Bryn Lindblad

Bryn Lindblad
Deputy Director

COUNCIL FOR
WATERSHED HEALTH

October 13, 2020

Safe Clean Water Program
County of Los Angeles
Department of Public Works
P.O. Box 1460
Alhambra, CA 91802-1460

**RE: Safe Clean Water Program FY 21-22 – Metro Orange Line (MOL) Water Infiltration and Quality Project**

Dear Safe Clean Water Program:

The Council for Watershed Health (CWH) is pleased to support the **Metro Orange Line (MOL) Water Infiltration and Quality Project** proposal submitted by Los Angeles County Metropolitan Transportation Authority (LA Metro) and Los Angeles Department of Water and Power.

The Metro Orange Line Water Infiltration and Quality Project (Project) proposes to implement 168 drywells across seven locations along the MOL with pretreatment facilities to capture, treat, and infiltrate stormwater runoff from 2,300 acres, resulting in an estimated groundwater recharge yield between 780 and 1,050 acre-feet/ year into the San Fernando Groundwater Basin. LA Metro's extensive land holdings and fortuitous siting within the highest value groundwater recharge areas within the region would allow for large-scale infiltration and aquifer recharge and has the potential to capture enough stormwater to allow Metro to become net water positive. The Project will be integrated and developed as part of the MOL Bus Rapid Transit Improvements Project, which will increase bus speeds by 29%, improve ridership by 39%, and enhance safety. LA Metro is also in the process of fully electrifying their MOL bus fleet with zero emission electric buses.

The Metro Orange Line Water Infiltration and Quality Project aligns with CWH's mission to advance the health and sustainability of our region's watersheds, rivers, streams and habitat - both in natural areas and urban neighborhoods. CWH sees this Project as an important opportunity to manage stormwater runoff more sustainably and strongly supports this Project.

Thank you for your consideration of CWH's support. Please feel free to contact me with any questions.

Sincerely,

Eileen Alduenda
Executive Director
eileen@watershedhealth.org

# METRO ORANGE LINE IMPROVEMENTS PROJECT

## March 2019 Community Meetings

## Summary Report

DRAFT 06-05-2019

Prepared by

**PAGE LEFT INTENTIONALLY BLANK**

# TABLE OF CONTENTS

# TABLES

# APPENDICES

## ABBREVIATIONS / ACRONYMS

BRT – Bus Rapid Transit

CNG – Compressed Natural Gas

LADOT – Los Angeles Department of Transportation

LRT – Light Rail Transit

MOL – Metro Orange Line

Metro – Los Angeles County Metropolitan Transportation Authority

SB-1 – Senate Bill 1

Q&A – Questions and Answers

# 1. Introduction

The Los Angeles County Metropolitan Transportation Authority (Metro) serves as the lead agency for the design and implementation of a range of transportation services in Los Angeles County, including improvements to countywide bus and light rail transit (LRT) operations, regional rail and Metrolink passenger rail operations, and freeway systems. Metro's mission is to provide continuous improvement of an efficient and effective transportation system for Los Angeles County.

The Metro Orange Line (MOL) Bus Rapid Transit (BRT), serving the San Fernando Valley from Chatsworth to North Hollywood, is the most successful BRT system in Los Angeles County and is considered the premier BRT Line in the United States. The MOL is essentially an extension of the Metro Red Line and expands access in the Valley to Metro's 120-mile rail system that crisscrosses Los Angeles County. The MOL includes rail-like amenities, dedicated right-of-way, advanced 60-foot Compressed Natural Gas (CNG) buses and signal priority system that navigates buses more efficiently through intersections.

Since its opening in 2005, the Metro Orange Line has become one of the most successful Bus Rapid Transit (BRT) lines in the country. Average daily ridership on this 18-mile corridor from North Hollywood to Chatsworth has reached 29,000 boardings per day.

The approved Metro Orange Line Improvements Project includes building up to 35 railroad-style gates at intersections along the Orange Line and constructing grade-separated structures to elevate the busway, bike path and associated stations at Van Nuys Bl and Sepulveda Bl.

Funding from Measure M and the SB1 Local Partnership Program grant provide up to $320 million for the Metro Orange Line Improvements Project, which will improve bus travel times and safety along the corridor.

The Orange Line provides a critical link in the transportation network Metro is building to transform the San Fernando Valley and improve regional mobility.

The Orange Line is expected to connect to four other transit projects with funding from Measure M:

- East San Fernando Valley Transit Corridor
- Sepulveda Transit Corridor
- North Hollywood to Pasadena BRT
- North San Fernando Valley BRT

As part of the Project development process, Metro is committed to a comprehensive outreach program that provides project stakeholders with the necessary tools and resources to be educated and informed and to provide valuable input at key milestones.

A series of project kick-off open houses were held in late November and early December 2017, which served as the first round of public involvement on the MOL BRT Improvements Project.

In March 2018, in partnership with the San Fernando Valley Council of Governments, Metro hosted a half-day tour of the Metro Expo Line for approximately 30 elected and city staff, as well as local transit advocates. The tour group traveled from the MOL Sepulveda Station to Westwood and then rode the

Expo Line to Santa Monica to allow attendees to see and experience elements of the Expo Line that will be similar to the planned improvements along the Metro Orange Line, including quad/ped gates, etc.

In June 2018, Metro held community open houses in Van Nuys and North Hollywood to provide stakeholders with an update on Metro projects in the San Fernando Valley, including the MOL Project, the launch of the Warner Center Bus Shuttle and other related projects.

In March 2019, Metro hosted two community meetings in Canoga Park and North Hollywood to present an update on the project, including details on the pilot gate, grade separations, and traffic/noise analysis. Attendees also had an opportunity to talk directly to Metro staff and ask questions.

This summary documents activities leading up to and during the two community meetings.

## 2. Approach and Strategy

Prior to the public meetings, the project team hosted two elected/city staff briefings and conducted project awareness at six MOL stations.

The following is a summary timeline for outreach activities.

***Table 2-1 Notification Period & Timeline***

| Date | Activity/Event | Target Audience |
|---|---|---|
| Monday, February 25 | • City of Los Angeles elected briefing | • Elected/city staff |
| Week of March 4 | • Distribute eblast invite for elected briefing | • Elected/city staff |
| Week of March 11 | • Distribute general public eblast<br>• Facebook advertising begins<br>• Take-one distribution to Metro divisions and municipal operators<br>• Social media toolkit distributed to elected offices and neighborhood councils<br>• Source/El Pasajero posts announcing meeting dates | • General public |
| Week of March 18 | • Elected city/staff briefing (3/18/19)<br>• Metro Orange Line Station outreach | • Elected/city staff<br>• Transit users |
| Tuesday, March 26 | Public Meeting #1<br>Rose Goldwater Room<br>Westfield Topanga Mall | • General public/ stakeholders |
| Wednesday, March 27 | Public Meeting #2<br>North Hollywood Senior Center | • General public/ stakeholders |
| Week of April 1 | Thank You Eblast | • General public/ stakeholders |

# 3. Notification of Community Open House

To promote maximum public awareness, a variety of noticing methods were implemented in advance of the community meetings. These included:

- Electronic distribution (4 eblasts)
- Take-one distribution at six Metro Orange Line Stations
- Take-one distribution aboard the Metro Orange Line and other Metro bus lines
- Media coverage (earned media) and extended outreach
- Social media – boosted posts and advertisements
- Phone calls and emails by Metro to targeted key stakeholders
- Project communication tools – website and helpline

All forms of noticing provided meeting details (dates, times, locations, and language services), as well as contact information for accessing additional project details.

## 3.1 Take-Ones

A take-one **(Appendix A)** was developed in English and Spanish. The meeting notice included information on the community meetings, including the dates, times and locations, as well as the project website, helpline and email. A total of 17,570 take-ones were distributed as follows:

- Division 2, 8 and 15 serving the San Fernando Valley: 15,075
- Metro Orange Line: 1,025
- Metro Customer Centers and other locations: 700
- Distribution at six Metro Orange Line stations: 770

## 3.2 Car cards on Orange Line buses

Car cards were developed to display on all Orange Line buses **(Appendix B)**. The cards were posted on the entire fleet on January 22, 2019 and will run through June 3, 2019. The cards were intended to advise current Orange Line riders about upcoming improvements to the line, including bridges (grade separations) and gates.

## 3.3 E-blasts

An electronic version of the notice **(Appendix B)** was distributed in English and Spanish via e-blast to over **1,044** contacts included in the project database a total of four (4) times in advance of the Community Open House Meetings in March 2019. A final e-blast in English and Spanish with links to the meeting materials and project website was sent on Tuesday, April 2, 2019 to over **1,071** contacts in the database (including those who provided contact information at the meetings).

***Table 3-1 E-blast Distribution Schedule***

| No. | E-Blast Type | Date Sent | Recipients | Views/Opens | Open Rate |
|---|---|---|---|---|---|
| 1 | Initial meeting notice | March 7, 2019 | 1,044 | 235 | 29.5% |
| 2 | Reminder #1, meeting notice | March 13, 2019 | 1,048 | 224 | 27.9% |
| 3 | Reminder #2, meeting notice | March 19, 2019 | 1,048 | 231 | 29.1% |
| 4 | Reminder #3, meeting notice | March 25, 2019 | 1,046 | 216 | 27.7% |
| 5 | Thank you notice | April 2, 2019 | 1,071 | 231 | 28.7% |

## 3.3 Information Distribution at MOL Stations

The outreach team set up information pop-ups to distribute take-ones as noted below to provide transit riders with information about the meetings in English and Spanish at the Van Nuys, Canoga, Valley College, North Hollywood, Reseda and Sepulveda MOL Stations during peak commuter travel times. The purpose of the pop-ups was to provide project and community meeting awareness to riders. Many of our station outreach activities were conducted by Spanish-speaking staff. Staff communicated in Spanish as appropriate to convey details about the upcoming meetings and relay project information but no specific data regarding Spanish engagement was collected since no survey was underway and this effort was mostly a "get-out-the-word" type of engagement.

Sepulveda Station Outreach

Van Nuys Station Outreach

***Table 3-2 Station Outreach***

| No. | Station | Date | Rider Engagement |
|---|---|---|---|
| 1 | Van Nuys Station | March 18, 2019, 6-8am | 100 |
| 2 | Canoga Station | March 19, 2019, 6-8 am | 160 |
| 3 | Valley College Station | March 19, 2019, 11am-1pm | 60 |
| 4 | North Hollywood Station | March 19, 2019, 4-6pm | 150 |
| 5 | Reseda Station | March 21, 2019, 6-8am | 50 |
| 6 | Sepulveda Station | March 21, 2019, 6-8am | 250 |

## 3.4 Advertisements

***Social Media***

Metro took the lead in online advertising and social media. Prior to the meetings, a Facebook ad linking to the Source article was run in English and a Facebook ad linking to the El Pasajero article was run in Spanish extending out a distance of .5-1 mile around the Metro Orange Line. Table 3-3 below identifies the flight date for each advertisement, as well as reach and engagement data.

***Table 3-3 Social Media Advertisements***

| No. | Social Media | Ad Focus | Publication Dates | Metrics |
|---|---|---|---|---|
| 1. | **Facebook** | Link to El Pasajero Article (Spanish) | March 14, 2019 – March 27, 2019 | Source Clicks: 807<br>Ad Reach: 23,542<br>Frequency: 1.91<br>Impressions: 45,003<br>Reactions: 258<br>Shares: 41<br>Comments: 20 |
| 2. | **Facebook** | Link to The Source Article | March 14, 2019 – March 27, 2019 | Source Clicks: 1,511<br>Ad Reach: 47,917<br>Frequency: 1.97<br>Impressions: 94,531<br>Reactions: 286<br>Shares: 38<br>Comments: 53 |
| 1. | **Facebook** | Post-Community Meeting Ad (Spanish) | April 5, 2019 – April 19, 2019 | Source Clicks: 472<br>Ad Reach: 27,607<br>Frequency: 1.55<br>Impressions: 42,866<br>Reactions: 117<br>Shares: 15<br>Comments: 21 |
| 2. | **Facebook** | Post-Community Meeting Ad (English) | April 5, 2019 – April 19, 2019 | Source Clicks: 774<br>Ad Reach: 35,765<br>Frequency: 1.67<br>Impressions: 59,863<br>Reactions: 129<br>Shares: 11<br>Comments: 11 |

## 3.5 Elected/City Staff Briefings

Metro hosted two elected/city staff briefings to provide an update on the Orange Line BRT Improvements Project and a preview of upcoming community meetings, including updates on the pilot gate, grade separations, and traffic analysis. Participants were provided a package of "Take One" pamphlets for distribution and/or placement at their local offices.

The first briefing was held on Monday, February 25, 2019 at Los Angeles City Hall and included representatives from the following offices and city departments:

- Councilmember Nury Martinez
- Councilmember Bob Blumenfield
- Councilmember David Ryu
- Councilmember Paul Koretz
- Councilmember Paul Krekorian
- Councilmember Greig Smith
- Los Angeles Department of Transportation

The second briefing was held on Monday, March 18, 2019 at the Van Nuys State Office Building and included representatives from the following offices:

- State Senator Robert Hertzberg
- Assemblymember Luz Rivas
- Assemblymember Jesse Gabriel
- Assemblymember Christy Smith
- Los Angeles County Supervisor Sheila Kuehl
- Councilmember Bob Blumenfield
- Councilmember Paul Krekorian

## 3.6 Extended Outreach

Prior to the meetings, the outreach team sent information out to elected offices and key stakeholders including 11 nearby Neighborhood Councils. Following is a summary of the extended outreach coverage.

***Table 3-4 Extended Outreach Coverage***

| Source | Article Title |
|---|---|
| 1. Councilmember Paul Krekorian Facebook | *Post on March 21, 2019* |
| 2. Councilmember Bob Blumenfield Facebook | *Posts on March 19, 2019 and March 26, 2019* |
| 3. Warner Connects Facebook & Twitter | *Posts on March 11, 2019* |
| 4. Neighborhood Council Valley Village | *Metro Orange Line BRT Project Community Meeting* |
| 5. Greater Valley Glen Council | *Metro Orange Line BRT Project Community Meeting* |
| 6. Van Nuys Neighborhood Council | *Metro Orange Line BRT Project Community Meeting* |
| 7. NoHo West Neighborhood Council | *Metro Orange Line BRT Project Community Meeting* |
| 8. North Hollywood North East Neighborhood Council | *Metro Orange Line Community Meeting* |
| 9. Valley Industry and Commerce Association (VICA) | *Metro Orange Line BRT Improvements and Project Open House* |
| 10. Woodland Hills Warner Center Neighborhood Council | *Metro Orange Line Improvements Project Info* |

## 3.7 Earned Media

Metro Public Relations posted to the Metro blog (The Source/El Pasajero) and responded to media queries. Table 3-4 below provides an overview of the extended outreach/earned media. Screenshots of this coverage is available in **Appendix C.**

***Table 3-5 Earned Media***

| Media Outlet | Article Title | Published Date |
|---|---|---|
| 1. GreenBiz | *Here's the 101: How to create transit-oriented communities in Los Angeles* | 3/12/2019 |
| 2. The Hub – LA (Blog) | *Angelenos to voice concerns on Metro Projects at open House Meetings* | 3/19/2019 |
| 3. Los Angeles Daily News | *Orange Line project could shorten bus commute by 30 percent, Valley motorists might be delayed, says Metro* | 3/26/2019 |
| 4. Urbanize Los Angeles | *A look at the $361-Million Plan to Speed Up the Orange Line* | 3/28/2019 |
| 5. CurbedLA | *Metro prepares to upgrade the Valley's popular Orange Line bus route* | 4/2/2019 |

# 4. Community Meetings

The community meetings were held on Tuesday, March 26 and Wednesday, March 27, 2019 as shown below. The purpose of the meetings was to present new information, including updates on the pilot gate, grade separations, and traffic analysis.

***Table 4-6 Community Meetings***

| Meeting | Date | Location/Address |
|---|---|---|
| **Public Meeting #1**<br>**Canoga Park** | Tuesday<br>March 26, 2019 | Rose Goldwater Community Center<br>Westfield Topanga<br>21710 Vanowen St<br>Canoga Park, CA 91303 |
| **Public Meeting #2**<br>**North Hollywood** | Wednesday<br>March 27, 2019 | North Hollywood Senior Center<br>5301 Tujunga Av<br>North Hollywood, CA 91601 |

## 4.1 Format

The meetings offered both an open house and formal presentation **(Appendix D)**. The open house format occurred during the first 30 minutes of each meeting, followed by a formal presentation and Q&A session, after which the open house resumed for the last 30 minutes of the meeting. The open house format allowed participants the opportunity to view project exhibits, engage with project representatives, and submit written comments **(Appendix H).** The meetings featured project materials in English and Spanish with support from Spanish interpreters and Spanish-speaking staff.

The first meeting (Canoga Park on March 26) was held early in the morning with a goal of drawing attendees who might not attend an evening meeting, including business owners and business community representatives as well as older individuals who prefer to avoid nighttime driving. The early start time, while experimental, was successful in attracting these audiences. Councilmember Blumenfield also chose to attend the morning meeting to connect with constituents and share his thoughts on the project, and his office staffed an information table throughout the open house. The second meeting (North Hollywood on March 27) was planned with an earlier than typical meeting start time in order to offer local residents, commuters, and Neighborhood Council representatives/attendees a convenient start time to coincide with other activities. . Several North Hollywood meeting attendees took copies of project materials for distribution at their respective community and neighborhood meetings scheduled for later that evening or later in the week.

## 4.3 Public Comments

Meeting participants had an opportunity to submit comments via a variety of methods:

1. Questions during the meetings
2. Written comments at the meetings
3. Post-it notes on rollout maps
4. Website via an online comment form
5. Mail
6. Email
7. Project helpline

## 4.4 Spanish Interpreters

Two Spanish interpreters were available at each community meeting and additional Spanish-speaking staff was present to provide additional interpretation support. The PowerPoint presentation was translated into Spanish and made available upon request. In addition, the meeting notices included Metro's standard 72-hour advance notice for requesting any language and other special accommodations.

## 4.5 Information Stations

At the community meetings, boards **(Appendix F**) were displayed around the room. In addition, the meetings featured interactive screens in order to provide engaging, transparent content for diverse audiences. These screens allowed attendees to focus in on their neighborhoods to better understand specific traffic and noise impacts in their neighborhood and have their specific questions answered by the technical team. In addition, one screen featured a video of the gates operating elsewhere in the Metro rail system for attendees who may not be familiar with this technology. This video ran on a loop during the open houses. The use of the interactive screens enhanced Metro's efforts to be open and transparent about the impacts of the gates on the community.

Attendees were encouraged to visit each station at their leisure before and after the formal presentation and Q&A session. For ease of navigating the stations in an order that made most sense, "footprint" markers were affixed to the ground to direct the flow of suggested movement at the meetings. The information stations were fully staffed throughout the entire open house session and during the formal presentation. These stations provided a platform for participants to interact with the project team to have their questions answered and to provide information that was catered to their level of interest.

During the open house session, questions and responses were handled individually by project team members and attendees were encouraged to submit comments in writing. Metro continues to accept comments using the project communication methods via the website, email, helpline, and direct mail.

Table 4-1 provides an overview of the information stations that were on display at the Open House meetings. Meeting materials are available on Metro's website via Metro.net/orangeline. The meeting materials including the displays at information stations were developed in coordination with the technical team and approved by Metro.

***Table 4-1 Community Open House Meeting Information Stations***

| Station Topic | Boards | Additional Information |
|---|---|---|
| Welcome/Registration | | |
| Project Overview | Measure M Map Project Overview Benefits | |
| Interactive Station | | Touch-screen with layers including traffic, noise, etc. |
| Safety | Renderings of MOL gates | Screen with video of rail gates in action |
| Grade Separations | Sepulveda grade separation; information about Van Nuys grade separation and bike path | |
| Vehicle Technology | Zero-emission bus technology | |
| Joint Development near MOL stations (NoHo Meeting) | Information boards | |
| Comment Station | Roll out maps | |
| Refreshments | | |
| Noho-Pasadena BRT Project (NoHo Meeting) | | |
| CD3 Table (Canoga Park Meeting) | | |

## 4.6 Additional Features and Resources

*Registration/Handouts* – Upon arrival, attendees were asked to sign in and as part of the registration process, received a bilingual (English/Spanish) question card (**Appendix G.1**), comment card **(Appendix H.1)** and project fact sheet. Project staff greeted guests and provided an overview of the meeting format and how to submit comments.

*Public Comment Tables* – English and Spanish comment cards, comment card collection boxes and pens were placed on tables at strategic locations in the meeting room. Staff encouraged meeting participants to submit written or electronic comments. In addition, there were large-scale rollout maps set up on tables in the middle of each meeting room with post-it notes for attendees to write their comments. These tables were staffed by project team members, who engaged in discussion with stakeholders. See section 4.10 for a summary of comments made at the rollout maps.

## 4.8 Summary of Public Participation

Table 4-2 below provides a detailed summary of Community Open House participation and number of comment cards **(Appendix H)** submitted by meeting attendees. The section includes a summary of the open house meeting with a summary of key questions and comments received during the meetings. It is important to note that while the attendance at the Canoga Park meeting was smaller compared to the North Hollywood meeting, many of the Canoga Park meeting attendees were highly engaged with many questions and comments share during conversations at the meeting stations.

*Table 4-2 Community Open House Meetings Summary*

| Meeting | Sign-Ins | Comment Cards Submitted |
|---|---|---|
| **Canoga Park Community Meeting** | 14 | 3 |
| **North Hollywood Community Meeting** | 39 | 9 |
| **Total** | **53** | **12** |

*Table 4-3 Community Open House Meeting Key Stakeholders*

| **Canoga Park Community Open House Meeting**<br>Tuesday, March 26, 2019 | |
|---|---|
| **Stakeholder Groups** | **Key Engagement/Participants** |
| **Participants** | • Question Cards Submitted: 2<br>• Comment Cards Submitted: 3 |
| **Elected Office** | • Councilmember Bob Blumenfield (provided welcoming remarks and staff hosted a table at the meeting) |
| **Neighborhood Councils** | • Mary Paterson, Canoga Park Neighborhood Council |
| **Agencies** | • Monroe Jones, North Los Angeles County Regional Center |
| **Other Stakeholder Organizations** | • Armando Flores, Valley Industry & Commerce Association<br>• Julia Wean, Warner Connects<br>• Kathy Delle Donne, Tarzana Improvement Association<br>• Katherine Thomas, West Valley Warner Center Chamber of Commerce<br>• Greg Jackson, Warner Center Association<br>• Brian Silk, Pierce College |

| North Hollywood Community Open House Meeting<br>Wednesday, March 27, 2019 | |
|---|---|
| **Stakeholder Groups** | **Key Engagement/Participants** |
| **Participants** | • Question Cards Submitted: 10<br>• Comment Cards Submitted: 9 |
| **Elected Officials** | • Yvonne Perez, Office of Councilmember Nury Martinez, District 6<br>• Doug Mensman, Office of Councilmember Paul Krekorian, District 2<br>• Jessica Orellana, Office of County Supervisor Sheila Kuehl, District 3<br>• Hannah Kelley, Office of State Senator Robert Hertzberg, District 18 |
| **Neighborhood Councils** | • Barry Johnson, Studio City Neighborhood Council<br>• Max Flehinger, Tarzana Neighborhood Council<br>• Glenn Bailey, Encino Neighborhood Council<br>• Bob Peppermiller, North Hollywood Neighborhood Council<br>• Suzanne Lewis, Valley Village Neighborhood Council<br>• Alice Hart, Valley Village Neighborhood Council |
| **Agencies** | • John Casselberry, City of Simi Valley<br>• Jordan Fraade, City of Los Angeles |
| **Other Stakeholder Organizations** | • Zachary Rynew, Los Angeles County Bicycle Coalition |

At both meetings, participants were offered the opportunity to submit questions for response following the presentation. A total of **12 question cards** collectively were submitted. Below is a brief summary of the major topics that were expressed during the question and answer portion of the presentation (not comprehensive; intended as a high-level snapshot):

- **Noise**
  - Gate bells are extremely loud. What can be done to mitigate?
- **Traffic**
  - A gate will cause more car congestion at intersections.
- **Railroad Type Gates**
  - During rush hour do you know how long the gates will be down?
- **Bus Connectivity**
  - Improve transit bus connections to Orange Line stations.
- **Rideshare**
  - Designate specific area at stations for rideshare pickups/drop offs.
- **Operations**
  - Electronic signage at stations to help navigate around and with bus connection information.

  - Using the Metro system can be challenging.

- **Safety**
  - Recommend buses are equipped with intercom system in case of emergency to help improve safety.
  - Would like to see extra security at stations.

## 4.9 Summary of Community Meeting Comments

Table 4-4 is a summary of the comments received **(Appendix G & Appendix H)** during the community meetings**.** Concerns were safety on buses and at stations, homeless issues, increasing ridership capacity, bike and pedestrian improvements, and first and last mile connections.

*Table 4-4 Comment/Question Summaries*

| COMMUNITY OPEN HOUSE MEETINGS COMMENTS | | |
|---|---|---|
| **Category** | **Comment/Question Summaries** | **No. of Comments** |
| General | • What is meant by a CEQA exemption? | 1 |
| Operations | • (Provide) electronic signage at stations with information about bus connections<br>• Improvements to navigating Metro system<br>• Will the gates have noise as well as light signals?<br>• Will power lines along Sepulveda be raised when the bridge is built? | 4 |
| Railroad Type Gates | • During rush hour, how long the gates will be down?<br>• Are you removing a lane of traffic for the gate medians? | 2 |
| Active Transportation | • Is there any way to improve signage on the bike path so it's clearer to people walking to stay on the pedestrian side? | 1 |
| Grade Separations | • It would be best to have the entire busway be separated from the street, either elevated or below grade, but not at grade | 1 |
| Parking | • Are you going to look at increased parking at stations?<br>• Will management be aware of increased parking needs and be willing to reduce the space currently allocated to Keyes Motors at the Sepulveda Station? | 1 |
| Rideshare | • Designate an Uber/Lyft pickup and drop off point at each station | 1 |
| Signal Priority | • How do we work with the city to get green light for buses? | 1 |
| Traffic | • A gate will increase traffic congestion | 1 |
| Bus Connectivity | • Improve transit bus connections to Orange Line stations | 1 |
| Safety | • Recommend buses are equipped with intercom system in case of emergency to help improve safety<br>• Will elevators have cameras?<br>• Would like to see extra security at stations | 3 |

## 4.10 Summary of Map Comments

Table 4-5 is a summary of the comments provided on the roll-out maps, organized by station location.

***Table 4-5 Map Comments***

| Station/Location | Comments |
|---|---|
| Chatsworth Station | No restroom |
| Sherman Way Station | • Need a stop at Saticoy St (Either alignment)<br>o Orange Line<br>o 601 Line<br>*There are schools, businesses and housing |
| Canoga Station | • Add restrooms at Canoga Station<br>• No restrooms |
| Pierce College Station | • Bridge over Victory Bl needed (East of Pierce) |
| Reseda Station | • Elevate Reseda Station<br>• Add restrooms at the Reseda Station<br>• Bridge needed over Reseda Bl |
| White Oak | • Need a stop at White Oak. There are parks, shopping and freeway service |
| Balboa Station | • Elevate Balboa Station<br>• Need better access to Lake Balboa Park from Balboa Station<br>• Bridge needed over Balboa Station |
| Balboa/Woodley | • Make a pedestrian crossing light between Balboa Av and Woodley to default to green for Orange Line |
| Havenhurst/Orange Line | • Make light at Hayvenhurst default to green for the Orange Line |
| Sepulveda Station | • Sepulveda Station parking lot needs to be redeveloped with new housing, streets, retail, office buildings and a park<br>• Sepulveda pass monorail would be elevated along Sepulveda Bl down center median<br>• Monorail station would have to be built over Sepulveda Station/Orange Line bridge<br>• Consider Monorail station at Sepulveda and Burbank Bl<br>• Consider Sepulveda Monorail station at Sepulveda and Vanowen St. There is housing, shopping, and restaurants |
| Van Nuys Station | • Where in this area will Van Nuys Bl (ESFV) light rail terminate?<br>• Make sure MOL–light rail transfer is as easy and seamless as possible.<br>• Maybe timed transfers?<br>• Restrooms needed at Van Nuys Station |

| Station/Location | Comments |
|---|---|
| Woodman Station | • Please improve connecting transit bus service to the Orange Line Please improve frequency of connecting service to the stations. We need better headway and more than once an hour<br>• March 27, 2019 bus driver had to continuously honk at Woodman station because car would not yield to the bus the right-of-way<br>• Please have electronic signs at Orange Line station indicating when the connecting transit buses will arrive at the station<br>• Bridge needed over Woodman Av and Oxnard St<br>• Elevate Woodman Station |
| Valley College Station | • Bridge over Burbank and Fulton needed<br>• Elevate Valley College Station |
| Coldwater Canyon | • There should be a stop at Coldwater Cyn<br>• Where line crosses Chandler:<br>o Concern about noise from gates<br>o Likes current signal controls<br>o Intersection at Chandler 13001 Chandler<br>o No accidents - never even a single accident since the line opened. This crossing intersection has been the safest<br>• Cars need to be fined $5,000 for using the Orange Line as a road. I've seen cars multiple times at or near Leghorn Av |
| Whitsett Av | • Concern regarding bell noise at Chandler and Whitsett<br>o Residential area<br>o Right turn violations not an issue |
| Laurel Canyon Station | • Switch the pedestrian crossing light at Agnes Av to default to green for the Orange Line, instead of flashing red<br>• Consider high density development around Laurel Cyn Station<br>• Bridge needed over Laurel Canyon Bl<br>• Elevate Laurel Canyon Station |
| North Hollywood Station | • Prioritize obtaining signal preemption opportunity at the Tujunga Bl crossing. Currently buses just leaving the NoHo station must wait at Tujunga for over three minutes for a green light<br>• You need to put an electronic bike locker at the NoHo Station, so all can use them<br>• Metro customer information center needed at NoHo Station<br>• Metro Red Line station entrance needed at the southwest corner of Lankershim and Chandler<br>• Consider a Metro Red Line extension to the NoHo West mixed-use development and to Panorama City |

## 4.11 Summary of Comments Submitted Outside of Meetings

In addition to the meetings themselves, stakeholders commented about the project via the project email, on the Metro Source posts related to the meetings and on the Facebook posts that advertised the meetings. A summary of those comments follows below.

***Table 4-6 Comments Submitted Outside of Meetings***

| COMMUNITY OPEN HOUSE MEETINGS COMMENTS | | |
|---|---|---|
| **Category** | **Comment/Question Summaries** | **Number of Comments** |
| Cost | • Concerns about costs; some feel it would be better spent to convert to an underground route | 3 |
| Railroad Type Gates | • Concerns about delays from the gates similar to Expo Line | 8 |
| General | • Comments ranging from supportive/positive about service to concerns about cleanliness, homelessness | 37 |
| Conversion to Light Rail | • Support for converting MOL to light rail; frustration about the long timeframe | 5 |
| Operations | • Complaints regarding headways and travel times | 7 |
| Grade Separations | • Comment regarding how to integrate ESFV with MOL and Sepulveda at Van Nuys | 1 |
| Traffic | • Range of comments including concerns about increased traffic as well as the need for the project | 4 |
| Safety | • Comments regarding safety on-board and at stations; skepticism regarding the need for safety improvements along MOL | 7 |

# Appendix G

# Question Card

## Appendix G.1

Question Card

Metro

# Metro Orange Line Improvements Project

## *Proyecto de Mejoras de la línea Orange Line de Metro*

**PUBLIC MEETINGS – March 26, 27, 2019**
***Reunionés Comunitarias – 26 de marzo y el 27 de marzo de 2019***

### Question Card/ *Tarjeta de Preguntas*

**Name/*Nombre*:** ______________________

**Affliliation/*Afiliación*:** ______________________

**Phone/*Numero de teléfono*:** ______________ **Email/*Correo Electrónico*:** ______________

**Meeting Date/*Fecha de Reunión*:** ______________________

**Questions/*Preguntas*:**

Metro

# Metro Orange Line Improvements Project

## *Proyecto de Mejoras de la línea Orange Line de Metro*

**PUBLIC MEETINGS – March 26, 27, 2019**
***Reunionés Comunitarias – 26 de marzo y el 27 de marzo de 2019***

### Question Card/ *Tarjeta de Preguntas*

**Name/*Nombre*:** ______________________

**Affliliation/*Afiliación*:** ______________________

**Phone/*Numero de teléfono*:** ______________ **Email/*Correo Electrónico*:** ______________

**Meeting Date/*Fecha de Reunión*:** ______________________

**Questions/*Preguntas*:**

# Appendix G.2

## Submitted Question Cards

Q/A: 3/26/18

Q1 - Security on the bus line?

A1: Transit watch app, operators are trained to help.

Q2: Transfer safety features to other trains lines?

Q3: Homeless people?

---

Q/A 3/27

Q1: Electronic signage

A1: Metro is introducing it on blue line

Q2: What is meant by CEQA exemption?

Q3: Will gate have noise and light signals?

A3: Yes we will

Q4: Metro and CADOT are we working with the city for green light ride?

Q5: How long gates will be down during peak hours?

Q6: increased parking needs?

**Metro**

## Metro Orange Line Improvements Project
### *Proyecto de Mejoras de la línea Orange Line de Metro*

**PUBLIC MEETINGS – March 26, 27, 2019**
***Reunionés Comunitarias – 26 de marzo y el 27 de marzo de 2019***

**Question Card/ *Tarjeta de Preguntas***

**Name/*Nombre*:** Stephen Paul Stelmach Sr.

**Affliliation/*Afiliación*:**

**Phone/*Numero de teléfono*:** **Email/*Correo Electrónico*:**

**Meeting Date/*Fecha de Reunión*:**

**Questions/*Preguntas*:**

1. There's overhead Power lines along Sepulveda, crossing
the orange Line, Will the power lines be raised up more when the
bridge is built, or will the power lines be
undergrounded at the Sepulveda station bridge?

2. Will Reseda station and Valley college station
be elevated as a bridge?

Metro

# Metro Orange Line Improvements Project

## *Proyecto de Mejoras de la línea Orange Line de Metro*

**PUBLIC MEETINGS – March 26, 27, 2019**
***Reunionés Comunitarias – 26 de marzo y el 27 de marzo de 2019***

**Question Card/ *Tarjeta de Preguntas***

**Name/*Nombre*:** NATE ZABLEN

**Affliliation/*Afiliación*:** So-CA TRANSIT ADVOCATES

**Phone/*Numero de teléfono*:**

**Email/*Correo Electrónico*:** nzab48@yahoo.com

**Meeting Date/*Fecha de Reunión*:** 3/27

**Questions/*Preguntas*:**

(1)-What is METRO doing To improve transit CONNECTIVITY to the Orange Line Stations: Some of the stations are served by connecting transit only once an hour and are not served at all after 7pm. (Such as Woodman)

(2) -Have electronic signage at Orange Line stations that will indicate when the connecting transit lines will arrive at the Orange Line stations-

**Metro**

## Metro Orange Line Improvements Project
*Proyecto de Mejoras de la línea Orange Line de Metro*

**PUBLIC MEETINGS – March 26, 27, 2019**
***Reunionés Comunitarias – 26 de marzo y el 27 de marzo de 2019***

### Question Card/ *Tarjeta de Preguntas*

**Name/*Nombre*:** Andrew Wang

**Affliliation/*Afiliación*:** Los Angeles County Bicycle Coalition

**Phone/*Numero de teléfono*:** (310)344-6163 **Email/*Correo Electrónico*:** andrewwang001@yahoo.com

**Meeting Date/*Fecha de Reunión*:** March 27, 2019

**Questions/*Preguntas*:** It would be best to have the entire busway be separated from the street, either elevated or below grade, but not at grade

# Metro Orange Line Improvements Project

*Proyecto de Mejoras de la línea Orange Line de Metro*

PUBLIC MEETINGS – March 26, 27, 2019
*Reunionés Comunitarias – 26 de marzo y el 27 de marzo de 2019*

## Question Card/ *Tarjeta de Preguntas*

**Name/*Nombre*:** Bob Rieth

**Affliliation/*Afiliación*:**

**Phone/*Numero de teléfono*:** **Email/*Correo Electrónico*:**

**Meeting Date/*Fecha de Reunión*:**

**Questions/*Preguntas*:** During rush hours, how long will the gates, on average, be closed?

How often and for how long will cars be "blocked" from the intersection?

Metro

# Metro Orange Line Improvements Project
## *Proyecto de Mejoras de la línea Orange Line de Metro*

**PUBLIC MEETINGS – March 26, 27, 2019**
***Reunionés Comunitarias – 26 de marzo y el 27 de marzo de 2019***

## Question Card/ *Tarjeta de Preguntas*

**Name/*Nombre*:** Rosemary Campbell

**Afflliation/*Afiliación*:**

**Phone/*Numero de teléfono*:** **Email/*Correo Electrónico*:**

**Meeting Date/*Fecha de Reunión*:**

**Questions/*Preguntas*:**

Will management be aware of increased parking needs and be willing to reduce the space currently allocated to Keyes Motors at Sepulveda Station — and similar

**Metro**

# Metro Orange Line Improvements Project

*Proyecto de Mejoras de la línea Orange Line de Metro*

PUBLIC MEETINGS – March 26, 27, 2019

*Reunionés Comunitarias – 26 de marzo y el 27 de marzo de 2019*

## Question Card/ *Tarjeta de Preguntas*

**Name/*Nombre*:** Ezequiel Coelho

**Affliliation/*Afiliación*:** none

**Phone/*Numero de teléfono*:**

**Email/*Correo Electrónico*:** Wwnsvx@gmail.com

**Meeting Date/*Fecha de Reunión*:** 3-27-2019

**Questions/*Preguntas*:**

is there anyway to improve signage on the Bike path so its clearer to people walking to stay on the pedestrian side.

Metro

## Metro Orange Line Improvements Project
### *Proyecto de Mejoras de la línea Orange Line de Metro*

**PUBLIC MEETINGS – March 26, 27, 2019**
***Reunionés Comunitarias – 26 de marzo y el 27 de marzo de 2019***

**Question Card/ *Tarjeta de Preguntas***

**Name/*Nombre*:** Andrew Wang

**Affliliation/*Afiliación*:** Los Angeles County Bicycle Coalition

**Phone/*Numero de teléfono*:**

**Email/*Correo Electrónico*:**

**Meeting Date/*Fecha de Reunión*:** March 27, 2019

**Questions/*Preguntas*:** Will the bells begin ringing prior to the lowering of the gates?

**Metro**

# Metro Orange Line Improvements Project
## *Proyecto de Mejoras de la línea Orange Line de Metro*

**PUBLIC MEETINGS – March 26, 27, 2019**
***Reuniónés Comunitarias – 26 de marzo y el 27 de marzo de 2019***

## Question Card/ *Tarjeta de Preguntas*

**Name/*Nombre*:** Lee Jamieson

**Affliliation/*Afiliación*:** GLTNC

**Phone/*Numero de teléfono*:** 763 9074 **Email/*Correo Electrónico*:**

**Meeting Date/*Fecha de Reunión*:**

**Questions/*Preguntas*:**

WILL WE HAVE DASH
WILL ELAVATERS HAVE CAMRAS AND POST POPLE
THAT URNAT IN ELAVATERS SO IT WILL STOP

**Metro**

## Metro Orange Line Improvements Project

## *Proyecto de Mejoras de la línea Orange Line de Metro*

**PUBLIC MEETINGS – March 26, 27, 2019**
***Reunionés Comunitarias – 26 de marzo y el 27 de marzo de 2019***

### Question Card/ *Tarjeta de Preguntas*

**Name/*Nombre*:** Faramarz Nabavi

**Affliliation/*Afiliación*:**

**Phone/*Numero de teléfono*:**

**Email/*Correo Electrónico*:**

**Meeting Date/*Fecha de Reunión*:** March 27, 2019

**Questions/*Preguntas*:**

1. How quickly can Metro get LADOT to reset the pedestrian crossings at Agnes Ave (Laurel Canyon Station) and between Balboa & Woodley to default to green for the Orange Line so buses don't have to stop there? Also, same for the intersection at Hayvenhurst, which is normally gated closed anyway.
2. Is Metro studying cascading signals, instead of crossing gates, that would triggered as the bus moves so we can maintain frequency?
3. Is Metro considering ~~both the~~ implementing both the street & freeway concepts for the NoHo-Pasadena BRT? They serve two different types of trips.

**Metro**

# Metro Orange Line Improvements Project
## *Proyecto de Mejoras de la línea Orange Line de Metro*

**PUBLIC MEETINGS – March 26, 27, 2019**
***Reunionés Comunitarias – 26 de marzo y el 27 de marzo de 2019***

**Question Card/ *Tarjeta de Preguntas***

**Name/*Nombre*:** DessaKaye

**Afflliliation/*Afiliación*:**

**Phone/*Numero de teléfono*:** **Email/*Correo Electrónico*:** dlKaye@juno.com

**Meeting Date/*Fecha de Reunión*:** 3/27/19

**Questions/*Preguntas*:**

① What is meant by "CEQA exemption" in July 2018 on the timeline; what environmental requirements have been waived?

② Are you removing a lane of traffic for the gate medians?

③ Will the gates have audio as well as light signals?

# Appendix H

# Comment Card

## Appendix H.1

Comment Cards

## Appendix H.2

Submitted Comment Cards

## Appendix H.3

Roll Out Map With Comments

Metro

# Metro Orange Line Improvements Project

## *Proyecto de Mejoras de la Orange Line de Metro*

## Comment Card /*Tarjeta de Comentarios*

**Name/*Nombre*:**

**Affiliation (i.e. organization, resident, business)/ *Afilicacion (es décir, organizacion, residente, negocio):***

**Address/*Domicilio*:**

**Phone/*Numero de telefono*:**

**Email/*Correo electronico*:**

**Please circle meeting what meeting you are attending/ *Por favor, marque la reunión a la que asiste*:**

**Tuesday, March 26, 2019**
***Martes, 26 de marzo de 2019***

**Wednesday, March 27, 2019**
***Miércoles, 27 de marzo de 2019***

**Thank you for your interest in the Metro Orange Line Improvements Project. We welcome your comments. *Gracias por su interés en el Proyecto de Mejoras de la Orange Line de Metro. Sus comentarios son bienvenidos.***

🌐 metro.net/orangeline ☎ 888.316.3889 ✉ orangeline@metro.net

Metro

In addition, comments can be submitted by mailing this self-addressed form, emailing at orangeline@metro.net or calling the project helpline at 888.316.3889. *Además, los comentarios pueden ser entregados enviando este formulario por correo, enviando un correo electrónico a orangeline@metro.net o llamando a la línea de ayuda del proyecto al 888.316.3889.*

Fold Here

Place
Stamp
Here

Fulgene Asuncion
Metro
One Gateway Plaza, Mail Stop 99-22-4
Los Angeles, CA 90012

# Appendix H.2

Submitted Comment Cards

# Metro Orange Line Improvements Project
## *Proyecto de Mejoras de la Orange Line de Metro*
## Comment Card /*Tarjeta de Comentarios*

**Name/*Nombre*:** Laurie Lake (818) 439-8085
└ see other comment

**Affiliation (i.e. organization, resident, business)/ *Afilicacion (es décir, organizacion, residente, negocio)*:** Resident concerned

**Address/Domicilio:** mom of/ high school

**Phone/*Numero de telefono*:** student - rides

**Email/*Correo electronico*:** Orange Line North Hollywood => Canoga

**Please circle meeting what meeting you are attending/ *Por favor, marque la reunión a la que asiste*:**

**Tuesday, March 26, 2019**
***Martes, 26 de marzo de 2019***

**Wednesday, March 27, 2019**
***Miércoles, 27 de marzo de 2019***

**Thank you for your interest in the Metro Orange Line Improvements Project. We welcome your comments. *Gracias por su interés en el Proyecto de Mejoras de la Orange Line de Metro. Sus comentarios son bienvenidos.***

Suggestion for safety -

I recommend each bus be equipped with an intercom system similar to metro trains.

Again, MANY LAUSD students ride the Orange Line. It is a great form of transportation. Just need better safety

metro.net/orangeline ☎ 888.316.3889 orangeline@metro.net

Metro

In addition, comments can be submitted by mailing this self-addressed form, emailing at orangeline@metro.net or calling the project helpline at 888.316.3889. *Además, los comentarios pueden ser entregados enviando este formulario por correo, enviando un correo electrónico a orangeline@metro.net o llamando a la línea de ayuda del proyecto al 888.316.3889.*

Thank you

# Metro Orange Line Improvements Project

## *Proyecto de Mejoras de la Orange Line de Metro*

## Comment Card /*Tarjeta de Comentarios*

**Name/*Nombre*:** Laurie Lake

**Affiliation (i.e. organization, resident, business)/ *Afilicacion (es décir, organizacion, residente, negocio)*:** Parent of LAUSD student (North Hollywood HS HGM)

**Address/Domicilio:** 5100 Don Pio Drive

**Phone/*Numero de telefono*:** (818)439-8085

**Email/*Correo electronico*:** PAPGAL@AOL.com

**Please circle meeting what meeting you are attending/ *Por favor, marque la reunión a la que asiste*:**

[✓ **Tuesday, March 26, 2019** *Martes, 26 de marzo de 2019*]

**Wednesday, March 27, 2019** *Miércoles, 27 de marzo de 2019*

**Thank you for your interest in the Metro Orange Line Improvements Project. We welcome your comments. *Gracias por su interés en el Proyecto de Mejoras de la Orange Line de Metro. Sus comentarios son bienvenidos.***

The metro app is confusing, hard to navigate. I was informed this was a way to text problems that occur on the OL if my son doesn't feel safe. He has seen numerous incidents of drugged out people, one person wielding a knife at another person, people getting on without paying, not much security.

Suggestion - Why not put signs on →

metro.net/orangeline 888.316.3889 orangeline@metro.net

Metro

In addition, comments can be submitted by mailing this self-addressed form, emailing at orangeline@metro.net or calling the project helpline at 888.316.3889. *Además, los comentarios pueden ser entregados enviando este formulario por correo, enviando un correo electrónico a orangeline@metro.net o llamando a la línea de ayuda del proyecto al 888.316.3889.*

# Metro Orange Line Improvement Project
# Prior Engineering and Development Faults

March 26, 2019

1. Traffic Signal Timing favors North-South traffic on Canoga Ave. This timing is woefully to the disadvantage to all east-west traffic along the following Street Intersections in the West Valley:

    Vanowen St
    Sherman Way
    Saticoy St
    Roscoe Blvd
    Parthenia St
    Nordhoff St

    At Each of these intersections, there are about 20 to 25 traffic signal lights controlling the Orange Line Private road that parallels Canoga Ave, right and left lane traffic, and through traffic on the East-West and North-South streets. In addition, the north-south pedestrian/bicycle pavements share cycle timing mostly with Canoga Ave.

    The overall signal cycle is very long. Although I haven't timed it, the cycle feels like two minutes. And, because the timing favors the north-south traffic on Canoga Ave, there are significant backups of east-west traffic on all of the intersections shown above.

    The remainder of intersections south of Vanowen St, are not impacted by the Orange Line and their timing considerations are more appropriately related to local traffic around Warner Center and the 101 Freeway and therefore are not a part of this discussion. Those intersections with Canoga Ave are:
    Victory Blvd
    Irwin St
    Oxnard Blvd
    Burbank Blvd.

    Serious engineering re-evaluation of traffic signal timing must be done to remove the city engineering-made bottlenecks.

    Here are my reasons:

    a. Canoga Avenue traffic does not justify the current timing rules because, north of Victory Ave, Canoga Ave is not a through street to the 118 freeway and has less traffic than might otherwise occur. There is a bottleneck where Canoga Ave runs into

Marilla Street and the subsequent zig-zag of traffic via of Owensmouth, Lass~~o~~en, Devonshire, and other streets does not support speedy travel for commuters travelling long distances via the 101 freeway through the West Valley to and from the 118 freeway. They take Topanga Canyon and DeSoto Streets directly to the 118 freeway on ramps and fuss about it all the time.

b. Furthermore, traffic on Topanga, north of Roscoe Blvd carries additional traffic that south of Roscoe is diffused by alternate pathways, namely Shoup Ave and Fallbrook Ave that could have been alleviated if the city, decades earlier, had proceeded with a proposed widening and re-rerouting the extension of Valley Circle Blvd to connect to Topanga near Chatsworth Street.

   Had the original Orange Line traffic design engineers understood the West Valley traffic anomaly, they would not have designed the signal timing to be so disadvantageous to east-west traffic on the West Valley's busiest streets.

c. At certain times of the day, and not necessarily during "rush hour", stopped traffic on the east-west streets noted above can back up more than a ¼ mile in each direction from the intersections in question, causing drivers to wait through two and three cycles of the traffic signals. The multiple minutes waiting time, for so many gasoline powered vehicles, is unnecessary air pollution.

d. Bus traffic north and south along the Orange line road is so infrequent, like ten minute intervals, that there does not seem to be any reason that bus traffic could be a factor in signal timing. And, certainly adding railroad crossing signals to manage that traffic is even less practical. That idea should be discarded.

e. There are times when I sit at the red light on Nordhoff, and on Parthenia Streets and wait for 30 seconds or more waiting for the light to go green while observing only one or two north-south vehicles pass by that is a constant reminder of how dismal the situation is.

Written by longtime resident:
Robert Bladow
8420 Sale Ave
West Hills.
March 25, 2019

# Metro Orange Line Improvements Project
## *Proyecto de Mejoras de la Orange Line de Metro*
## Comment Card /*Tarjeta de Comentarios*

**Name/*Nombre*:** NATE ZABLEN

**Affiliation (i.e. organization, resident, business)/ *Afilicacion (es décir, organizacion, residente, negocio)*:** SoCA TRANSIT Advocates

**Address/Domicilio:**

**Phone/*Numero de telefono*:**

**Email/*Correo electronico*:** nzab48@yahoo.com

**Please circle meeting what meeting you are attending/ *Por favor, marque la reunión a la que asiste*:** Tuesday, March 26, 2019 *Martes, 26 de marzo de 2019* [✓ Wednesday, March 27, 2019 *Miércoles, 27 de marzo de 2019*]

**Thank you for your interest in the Metro Orange Line Improvements Project. We welcome your comments. *Gracias por su interés en el Proyecto de Mejoras de la Orange Line de Metro. Sus comentarios son bienvenidos.***

1. Improve transit bus connectivity to the Orange Line Stations. Currently Metro buses serve the Woodman and Tampa Stations only once an hour. At some stations there is no connecting transit service after 7:30pm.
2 Have electronic digital signage at the Orange Line Stations which would indicate when the connecting buses will arrive to take you from the station
(3) Obtain from the City (LADOT) signal priority or preemption for the Orange Line buses crossing Tujunga Currently the buses must wait around three minutes for the light to chang.

🌐 metro.net/orangeline ☎ 888.316.3889 @ orangeline@metro.net

Metro

In addition, comments can be submitted by mailing this self-addressed form, emailing at orangeline@metro.net or calling the project helpline at 888.316.3889. *Además, los comentarios pueden ser entregados enviando este formulario por correo, enviando un correo electrónico a orangeline@metro.net o llamando a la línea de ayuda del proyecto al 888.316.3889.*

continued

→ the buses

Ex: If you see suspicious activity
or feel unsafe, please txt
(bus number of the exact bus)
to "a help"
line 911?)

This way people can quickly
report issues

Signs should be in English
+ Spanish and easy to read

Thank you ♡

Fold Here

---

Place
Stamp
Here

Fulgene Asuncion
Metro
One Gateway Plaza, Mail Stop 99-22-4
Los Angeles, CA 90012

## Metro Orange Line Improvements Project
## *Proyecto de Mejoras de la Orange Line de Metro*
## Comment Card /*Tarjeta de Comentarios*

**Name/*Nombre*:** Mary Garcia

**Affiliation (i.e. organization, resident, business)/ *Afilicacion (es décir, organizacion, residente, negocio)*:** Past member of 20 yrs NoHo NC

**Address/Domicilio:** 5123 Cahuenga Blvd. NoHo 91601

**Phone/*Numero de telefono*:** 818 5544582

**Email/*Correo electronico*:** MG91601@Gmail.com

**Please circle meeting what meeting you are attending/ *Por favor, marque la reunión a la que asiste*:**

**Tuesday, March 26, 2019** *Martes, 26 de marzo de 2019*

[✓ **Wednesday, March 27, 2019** *Miércoles, 27 de marzo de 2019*]

**Thank you for your interest in the Metro Orange Line Improvements Project. We welcome your comments. *Gracias por su interés en el Proyecto de Mejoras de la Orange Line de Metro. Sus comentarios son bienvenidos.***

Please give us a DASH now before you build your High Rise apts.

metro.net/orangeline ☎ 888.316.3889 orangeline@metro.net

Metro

In addition, comments can be submitted by mailing this self-addressed form, emailing at orangeline@metro.net or calling the project helpline at 888.316.3889. *Además, los comentarios pueden ser entregados enviando este formulario por correo, enviando un correo electrónico a orangeline@metro.net o llamando a la línea de ayuda del proyecto al 888.316.3889.*

## Metro Orange Line Improvements Project

## *Proyecto de Mejoras de la Orange Line de Metro*

## Comment Card /*Tarjeta de Comentarios*

**Name/*Nombre*:** Andrew Wang

**Affiliation (i.e. organization, resident, business)/ *Afilicacion (es décir, organizacion, residente, negocio)*:** Los Angeles County Bicycle Coalition

**Address/*Domicilio*:**

**Phone/*Numero de telefono*:**

**Email/*Correo electronico*:**

**Please circle meeting what meeting you are attending/ *Por favor, marque la reunión a la que asiste*:** Tuesday, March 26, 2019 *Martes, 26 de marzo de 2019* [✓ Wednesday, March 27, 2019 *Miércoles, 27 de marzo de 2019*]

**Thank you for your interest in the Metro Orange Line Improvements Project. We welcome your comments. *Gracias por su interés en el Proyecto de Mejoras de la Orange Line de Metro. Sus comentarios son bienvenidos.***

I think that there should be a specific area for rideshare at all of the rail stations adjacent, regardless of whether a park and ride lot is present.

metro.net/orangeline ☎ 888.316.3889 orangeline@metro.net

Metro

In addition, comments can be submitted by mailing this self-addressed form, emailing at orangeline@metro.net or calling the project helpline at 888.316.3889. *Además, los comentarios pueden ser entregados enviando este formulario por correo, enviando un correo electrónico a orangeline@metro.net o llamando a la línea de ayuda del proyecto al 888.316.3889.*

## Metro Orange Line Improvements Project
## *Proyecto de Mejoras de la Orange Line de Metro*
## Comment Card /*Tarjeta de Comentarios*

**Name/*Nombre*:** Ronald Kulberg

**Affiliation (i.e. organization, resident, business)/ *Afilicacion (es décir, organizacion, residente, negocio)*:**

**Address/Domicilio:**

**Phone/*Numero de telefono*:**

**Email/*Correo electronico*:** RONALDTHEBOY@GMAIL.COM

**Please circle meeting what meeting you are attending/ *Por favor, marque la reunión a la que asiste*:**

| | |
|---|---|
| **Tuesday, March 26, 2019**<br>***Martes, 26 de marzo de 2019*** | **Wednesday, March 27, 2019**<br>***Miércoles, 27 de marzo de 2019*** |

**Thank you for your interest in the Metro Orange Line Improvements Project. We welcome your comments. *Gracias por su interés en el Proyecto de Mejoras de la Orange Line de Metro. Sus comentarios son bienvenidos.***

Need to Place MORE "Actual NexT Arrival time" Sign in more ideal places, like AT the Top of the StAirs AND elevAter enteraced so ones know if they should rush or NoT.

🌐 metro.net/orangeline ☎ 888.316.3889 ✉ orangeline@metro.net

**Metro**

In addition, comments can be submitted by mailing this self-addressed form, emailing at orangeline@metro.net or calling the project helpline at 888.316.3889. *Además, los comentarios pueden ser entregados enviando este formulario por correo, enviando un correo electrónico a orangeline@metro.net o llamando a la línea de ayuda del proyecto al 888.316.3889.*

# Metro Orange Line Improvements Project
## *Proyecto de Mejoras de la Orange Line de Metro*
## Comment Card /*Tarjeta de Comentarios*

**Name/*Nombre*:** AMNON CHARASH

**Affiliation (i.e. organization, resident, business)/ *Afilicacion (es décir, organizacion, residente, negocio)*:** ① THIS INTERSECTION CROSSES A ONE-WAY CAR TRAFFIC ONLY, NOT A TWO-WAY. ② THERE IS NO RIGHT TURN ON THIS INTERSECTION THAT CAUSED ACCIDENTS IN OTHER INTERSECTIONS!

**Address/Domicilio:** 13001 CHANDLER BLVD, SHERMAN OAKS, CA 91401

**Phone/*Numero de telefono*:** (818) 267-6706

**Email/*Correo electronico*:** amnonc@yahoo.com

**Please circle meeting what meeting you are attending/ *Por favor, marque la reunión a la que asiste*:**

**Tuesday, March 26, 2019** *Martes, 26 de marzo de 2019*

[✓ **Wednesday, March 27, 2019** *Miércoles, 27 de marzo de 2019*]

THIS INTERSECTION IS BETWEEN COLDWATER CANYON & ETHEL AVE, RIGHT ON CHANDLER BLVD.

**Thank you for your interest in the Metro Orange Line Improvements Project. We welcome your comments. *Gracias por su interés en el Proyecto de Mejoras de la Orange Line de Metro. Sus comentarios son bienvenidos.***

INSTALLING A GATE AT THE INTERSECTION WHERE THE BUS CROSSES CHANDLER BLVD (AT 13001 CHANDLER LOCATION) IS TOTALLY UNNECESSARY. FIRST, SINCE THE LINE BEGAN OPERATING IN 2005 THERE HAS NEVER BEEN ONE SINGLE ACCIDENT AT THIS INTERSECTION. THE FLUSHING "BUS" SIGN IS CLERLY SEEN FROM FAR AWAY FROM THIS INTERSETION AND CAR TRAFFIC STOPS FOR THE BUS. INSTEAD OF A GATE, INCREASE THE TIME OF FLUSHING OF THIS "BUS" SIGN SO CARS WILL SEE IT EARLIER. ~~THE~~ SECONDLY, THE GATE BELLS ARE EXTREMELY LOUD AND THEY WILL CAUSE EXTREME DISTURBANCE TO THE RESIDENTS WHO LIVE AROUND THIS INTERSECTION. THIRDLY, A GATE WILL FURTHER SLOW DOWN CAR TRAFFIC AND INCREASE FURTHER THE AUTOMOBILE TRAFFIC CONGESTION WHICH IS EXTREMELY HEAVY AS IT IS. FOURTHLY, INCREASED RIDERSHIP WILL DOUBLE THE NUMBER OF BUSES. FIFTHLY, THERE IS ONLY ONE WAY CAR TRAFFIC AND NO RIGHT TURNS IN THIS INTERSECTION!

metro.net/orangeline ☎ 888.316.3889 orangeline@metro.net

In addition, comments can be submitted by mailing this self-addressed form, emailing at orangeline@metro.net or calling the project helpline at 888.316.3889. *Además, los comentarios pueden ser entregados enviando este formulario por correo, enviando un correo electrónico a orangeline@metro.net o llamando a la línea de ayuda del proyecto al 888.316.3889.*

## Metro Orange Line Improvements Project

## *Proyecto de Mejoras de la Orange Line de Metro*

## Comment Card /*Tarjeta de Comentarios*

Name/*Nombre*: LEE JAMIESON

Affiliation (i.e. organization, resident, business)/ *Afilicacion (es décir, organizacion, residente, negocio)*:

Address/*Domicilio*: 5345 BILOXI ST

Phone/*Numero de telefono*: 763 9074

Email/*Correo electronico*:

Please circle meeting what meeting you are attending/ *Por favor, marque la reunión a la que asiste*:

Tuesday, March 26, 2019
*Martes, 26 de marzo de 2019*

Wednesday, March 27, 2019
*Miércoles, 27 de marzo de 2019*

Thank you for your interest in the Metro Orange Line Improvements Project. We welcome your comments. *Gracias por su interés en el Proyecto de Mejoras de la Orange Line de Metro. Sus comentarios son bienvenidos.*

MAKE ORUGE LINE
2 ORUGE SAFTY STRIP REFLCTV
AND OMAHA ORUG BOTTOM

metro.net/orangeline ☎ 888.316.3889 orangeline@metro.net

Metro

In addition, comments can be submitted by mailing this self-addressed form, emailing at orangeline@metro.net or calling the project helpline at 888.316.3889. *Además, los comentarios pueden ser entregados enviando este formulario por correo, enviando un correo electrónico a orangeline@metro.net o llamando a la línea de ayuda del proyecto al 888.316.3889.*

## Metro Orange Line Improvements Project
## *Proyecto de Mejoras de la Orange Line de Metro*
## Comment Card /*Tarjeta de Comentarios*

**Name/*Nombre*:** Ronald Kolberg

**Affiliation (i.e. organization, resident, business)/ *Afilicacion (es décir, organizacion, residente, negocio)*:**

**Address/Domicilio:** ~~[illegible]~~ RonaldtheBoy@Gmail.com

**Phone/*Numero de telefono*:**

**Email/*Correo electronico*:**

**Please circle meeting what meeting you are attending/ *Por favor, marque la reunión a la que asiste*:**

**Tuesday, March 26, 2019**
***Martes, 26 de marzo de 2019***

**Wednesday, March 27, 2019**
***Miércoles, 27 de marzo de 2019***

**Thank you for your interest in the Metro Orange Line Improvements Project. We welcome your comments. *Gracias por su interés en el Proyecto de Mejoras de la Orange Line de Metro. Sus comentarios son bienvenidos.***

Your Statement of getting people to use Rapid Transit To be similar like what one does in car. Will never be true At least ~~[illegible]~~ until ~~one~~ ~~[illegible]~~ A Non-PASS rider can reboard at ~~same~~ same stop when still within th 2 hours and ~~to~~ continue on after they ~~B~~picked up their dinner of cleaners and continue on

metro.net/orangeline 888.316.3889 orangeline@metro.net

In addition, comments can be submitted by mailing this self-addressed form, emailing at orangeline@metro.net or calling the project helpline at 888.316.3889. *Además, los comentarios pueden ser entregados enviando este formulario por correo, enviando un correo electrónico a orangeline@metro.net o llamando a la línea de ayuda del proyecto al 888.316.3889.*

Metro

# Metro Orange Line Improvements Project
## *Proyecto de Mejoras de la Orange Line de Metro*
## Comment Card /*Tarjeta de Comentarios*

**Name/*Nombre*:** John Casselberry, Jr.

**Affiliation (i.e. organization, resident, business)/ *Afilicacion (es décir, organizacion, residente, negocio)*:**

**Address/*Domicilio*:** 1547 Christine Ave

**Phone/*Numero de telefono*:**

**Email/*Correo electronico*:** johnwcasselberryjr@gmail.com

**Please circle meeting what meeting you are attending/ *Por favor, marque la reunión a la que asiste*:** **Tuesday, March 26, 2019** *Martes, 26 de marzo de 2019* [✓ **Wednesday, March 27, 2019** *Miércoles, 27 de marzo de 2019*]

**Thank you for your interest in the Metro Orange Line Improvements Project. We welcome your comments. *Gracias por su interés en el Proyecto de Mejoras de la Orange Line de Metro. Sus comentarios son bienvenidos.***

As a Simi Valley resident that frequently connects to the Orange Line, I'm in strong support of this project and would love to see additional grade separations in the future.

metro.net/orangeline ☎ 888.316.3889 orangeline@metro.net

Metro

In addition, comments can be submitted by mailing this self-addressed form, emailing at orangeline@metro.net or calling the project helpline at 888.316.3889. *Además, los comentarios pueden ser entregados enviando este formulario por correo, enviando un correo electrónico a orangeline@metro.net o llamando a la línea de ayuda del proyecto al 888.316.3889.*

# Metro Orange Line Improvements Project
*Proyecto de Mejoras de la Orange Line de Metro*
**Comment Card /*Tarjeta de Comentarios***

Name/*Nombre*: Juana Limon.

Affiliation (i.e. organization, resident, business)/ *Afilicacion (es décir, organizacion, residente, negocio)*:

Address/Domicilio: 11047 Hesby St. North Hollywood.

Phone/*Numero de telefono*: (818) 855 06 72

Email/*Correo electronico*:

Please circle meeting what meeting you are attending/ *Por favor, marque la reunión a la que asiste*:

Tuesday, March 26, 2019
*Martes, 26 de marzo de 2019*

Wednesday, March 27, 2019
*Miércoles, 27 de marzo de 2019*

Thank you for your interest in the Metro Orange Line Improvements Project. We welcome your comments. *Gracias por su interés en el Proyecto de Mejoras de la Orange Line de Metro. Sus comentarios son bienvenidos.*

I would like to see more security on the train at 5:00 AM - I take the train from North Hollywood to Los Angeles.

metro.net/orangeline ☎ 888.316.3889 orangeline@metro.net

Metro

In addition, comments can be submitted by mailing this self-addressed form, emailing at orangeline@metro.net or calling the project helpline at 888.316.3889. *Además, los comentarios pueden ser entregados enviando este formulario por correo, enviando un correo electrónico a orangeline@metro.net o llamando a la línea de ayuda del proyecto al 888.316.3889.*

NRDC

Los Angeles County Public Works
900 S. Fremont Ave.
Alhambra, CA 91803

October 29, 2020

RE: Safe, Clean Drinking Water Program FY 21-22 – Metro Orange Line Water Infiltration and Quality Project

To Whom it May Concern:

I am writing on behalf of the Natural Resources Defense Council in support of the Los Angeles County Metropolitan Transportation Authority (LA Metro) and Los Angeles Department of Water and Power's Metro Orange Line (MOL) proposal for the Safe, Clean Water Program.

The MOL Water Infiltration and Quality Project (Project) proposes to implement 168 drywells across seven locations along the MOL with pretreatment facilities to capture, treat, and infiltrate stormwater runoff from 2,300 acres, resulting in an estimated groundwater recharge yield between 780 and 1,050 acre-feet/year into the San Fernando Groundwater Basin. This project, situated within some of the highest value groundwater recharge areas within the region, would allow for large-scale infiltration and aquifer recharge, and has the potential to capture enough stormwater to allow Metro to become net water positive.

Thank you for your consideration of my support. Should you have any questions regarding my support, you may contact me at cbell@nrdc.org.

Sincerely,

Corinne Bell

# ATTACHMENTS FOR SECTION 7.1:

## COST & SCHEDULE

# ATTACHMENTS FOR SECTION 7.2:

## COST SHARE

LA DWP Los Angeles Department of Water & Power

CUSTOMERS FIRST

**Eric Garcetti**, Mayor

Board of Commissioners
**Cynthia McClain-Hill**, President
**Susana Reyes**, Vice President
**Jill Banks Barad**
**Nicole Neeman Brady**
**Susan A. Rodriguez**, Secretary

**Martin L. Adams**, General Manager and Chief Engineer

October 15, 2020

Los Angeles County Metropolitan Transportation Authority
Craig Reiter
One Gateway Plaza
Mail Stop 99-16-9
Los Angeles, California 90012-2952

Subject: Letter of Support for METRO Orange Line Water Infiltration and Water Quality Project

Los Angeles Department of Water and Power (LADWP) is pleased to express support for the METRO Orange Line (MOL) Water Infiltration and Water Quality Project (Project) for consideration to the Safe Clean Water Program (SCWP) Call for Projects Round two.

LADWP strongly supports multi-benefit opportunities and partnerships in projects that help achieve increases in stormwater capture, groundwater recharge, water quality, and community improvements. The Project will provide fast and reliable ridership to disadvantage communities, enhance pedestrian safety, provide significant water quality and water supply benefits, as well as support the transition to electric bus operations at the MOL. This Project will assist LADWP in achieving its long-term local supply strategies and sustainability, through augmenting local groundwater supply in the San Fernando Groundwater Basin and improving the water quality in the Los Angeles River downstream. In addition, this Project aligns with the critical needs and priorities established within the SCWP guidelines and further contributes to the development of disadvantaged communities.

LADWP intends to be a funding partner with METRO for the implementation of the Project, once it is successful in receiving SCWP Round two funding. LADWP intends to provide up to $11,088,000 for the installation of 168 drywells ($66,000 per drywell) pending LADWP Board of Commissioners' approval. Additionally, LADWP understands METRO will be responsible for operations and maintenance of the aforementioned drywells, through their viable Project life.

As a local advocate for stormwater capture projects that provide multiple benefits and long-term sustainability, LADWP strongly supports this Project and recommends that the SCWP award funding for the Project. LADWP appreciates your consideration.

If you have any questions about this letter of support, please contact Mr. Art Castro, Manager of Watershed Management, at (213) 367-2966.

Sincerely,

David R. Pettijohn
Director of Water Resources

AC:lb/cyr
c: Art Castro
Delon Kwan

# ATTACHMENTS FOR SECTION 8.1:

# ENVIRONMENTAL DOCUMENTS AND PERMITS

Geosyntec consultants
engineers | scientists | innovators

Metro

# CEQA Environmental Checklist Form

## Metro Orange Line Water Infiltration and Quality Project

# 1. EVALUATION OF ENVIRONMENTAL IMPACTS

The following checklist is adapted from the California Environmental Quality Act (CEQA) Statute & Guidelines Environmental Checklist Form (Appendix G). The checklist may be used to meet the requirements of an initial study when the criteria set forth in CEQA Guidelines have been met. A discussion follows each environmental issue identified in the checklist.

Supporting documentation of the expected CEQA permitting process for the Project is included in Appendix A.

In this review, the following designations are used:

**Potentially Significant Impact:** An impact that could be significant, and for which no mitigation has been identified. If any potentially significant impacts are identified, an Environmental Impact Report (EIR) must be prepared.

**Less-Than-Significant With Mitigation Incorporated:** An impact that requires mitigation to reduce the impact to a less-than significant level.

**Less-Than-Significant Impact:** Any impact that would not be considered significant under CEQA based on the appropriate and applicable criteria and standards.

**No Impact:** The project would not have any impact.

## 1.1 Aesthetics

| | Potentially Significant Impact | Less Than Significant with Mitigation Incorporated | Less Than Significant Impact | No Impact |
|---|---|---|---|---|
| **I. AESTHETICS –** Would the project**:** | | | | |
| a) Have a substantial adverse effect on a scenic vista? | ☐ | ☐ | ☐ | ☒ |
| b) Substantially damage scenic resources including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway? | ☐ | ☐ | ☐ | ☒ |
| c) In nonurbanized areas, substantially degrade the existing visual character or quality of public views of the site and its surroundings? (Public views are those that are experienced from publicly accessible vantage point). If the project is in an urbanized area, would the project conflict with applicable zoning and other regulations governing scenic quality? | ☐ | ☐ | ☐ | ☒ |
| d) Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area? | ☐ | ☐ | ☐ | ☒ |

a-d) No impacts to aesthetics are anticipated. The proposed drywell and pretreatment facilities are subsurface.

## 1.2 Agriculture and Forestry Resources

| | Potentially Significant Impact | Less Than Significant with Mitigation Incorporated | Less Than Significant Impact | No Impact |
|---|---|---|---|---|
| **II. AGRICULTURE AND FORESTRY RESOURCES** – In determining whether impacts to agricultural resources are significant environmental effects, lead agencies may refer to the California Agricultural Land Evaluation and Site Assessment Model (1997) prepared by the California Department of Conservation as an optional model to use in assessing impacts on agriculture and farmland. In determining whether impacts to forest resources, including timberland, are significant environmental effects, lead agencies may refer to information compiled by the California Department of Forestry and Fire Protection regarding the state's inventory of forest land, including the Forest and Range Assessment Project and the Forest Legacy Assessment project; and forest carbon measurement methodology provided in Forest Protocols adopted by the California Air Resources Board. Would the project: | | | | |
| a) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use? | ☐ | ☐ | ☐ | ☒ |
| b) Conflict with existing zoning for agricultural use, or a Williamson Act contract? | ☐ | ☐ | ☐ | ☒ |
| c) Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220(g)), timberland (as defined by Public Resources Code section 4526), or timberland zoned Timberland Production (as defined by Government Code section 51104(g))? | ☐ | ☐ | ☐ | ☒ |
| d) Result in the loss of forest land or conversion of forest land to non-forest use? | ☐ | ☐ | ☐ | ☒ |
| e) Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use or conversion of forest land to non-forest use? | ☐ | ☐ | ☐ | ☒ |

a-e) No impacts to agriculture and forestry resources are anticipated. The entire project is within an urbanized area.

## 1.3 Air Quality

| | Potentially Significant Impact | Less Than Significant with Mitigation Incorporated | Less Than Significant Impact | No Impact |
|---|---|---|---|---|
| **III. AIR QUALITY –** Where available, the significance criteria established by the applicable air quality management or air pollution control district may be relied upon to make the following determinations. Would the project: | | | | |
| a) Conflict with or obstruct implementation of the applicable air quality plan? | ☐ | ☐ | ☒ | ☐ |
| b) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard? | ☐ | ☐ | ☒ | ☐ |
| c) Expose sensitive receptors to substantial pollutant concentrations? | ☐ | ☐ | ☒ | ☐ |
| d) Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people? | ☐ | ☐ | ☒ | ☐ |

a-d) The construction of the project could result in temporary emissions that would result in less than significant impacts. Metro's Green Construction Policy will be adhered to, which will limit the construction related emissions. There is a potential for temporary dust generation as a result of construction activities. A dust control plan will be developed, detailing dust control measures and monitoring requirements. SCAQMD Rule 402 will be adhered to. There is no anticipated permanent impact to air quality, and no control measures will be needed after construction is complete.

## 1.4 Biological Resources

| | **Potentially Significant Impact** | **Less Than Significant with Mitigation Incorporated** | **Less Than Significant Impact** | **No Impact** |
|---|---|---|---|---|
| **IV. BIOLOGICAL RESOURCES –** Would the project: | | | | |
| a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service? | ☐ | ☐ | ☐ | ☒ |
| b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service? | ☐ | ☐ | ☐ | ☒ |
| c) Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means? | ☐ | ☐ | ☐ | ☒ |
| d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites? | ☐ | ☐ | ☐ | ☒ |
| e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance? | ☐ | ☐ | ☐ | ☒ |
| f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan? | ☐ | ☐ | ☐ | ☒ |

a-f) No impacts to biological resources are anticipated. No existing pervious areas or habitat areas are proposed to be disturbed; construction will take place exclusively in areas that are already fully urbanized.

## 1.5 Cultural Resources

| | Potentially Significant Impact | Less Than Significant with Mitigation Incorporated | Less Than Significant Impact | No Impact |
|---|---|---|---|---|
| **V. CULTURAL RESOURCES** – Would the project: | | | | |
| a) Cause a substantial adverse change in the significance of a historical resource as defined in §15064.5? | ☐ | ☐ | ☐ | ☒ |
| b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to § 15064.5? | ☐ | ☐ | ☒ | ☐ |
| c) Disturb any human remains, including those interred outside of formal cemeteries? | ☐ | ☐ | ☒ | ☐ |

a) There are no historical resources within the project area.

b-c) There is a low likelihood of buried cultural resources within the project area. If such resources are encountered, construction work within the vicinity on the unpatinated discovery will halt. A SOI qualified archaeologist will assess the discovery and provide recommendations on the significance and treatment.

## 1.6 Energy

| | Potentially Significant Impact | Less Than Significant with Mitigation Incorporated | Less Than Significant Impact | No Impact |
|---|---|---|---|---|
| **VI. ENERGY** - Would the project: | | | | |
| a) Result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation? | ☐ | ☐ | ☒ | ☐ |
| b) Conflict with or obstruct a state or local plan for renewable energy or energy efficiency? | ☐ | ☐ | ☐ | ☒ |

a) The project would have a less than significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources.

b) The project would not conflict with or obstruct a state or local plan for renewable energy or energy efficiency.

## 1.7 Geology and Soils

| | Potentially Significant Impact | Less Than Significant with Mitigation Incorporated | Less Than Significant Impact | No Impact |
|---|---|---|---|---|
| **VII. GEOLOGY AND SOILS** – Would the project: | | | | |
| a) Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving: | | | | |
| i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42. | ☐ | ☐ | ☐ | ☒ |
| ii) Strong seismic ground shaking? | ☐ | ☐ | ☐ | ☒ |
| iii) Seismic-related ground failure, including liquefaction? | ☐ | ☐ | ☐ | ☒ |
| iv) Landslides? | ☐ | ☐ | ☐ | ☒ |
| b) Result in substantial soil erosion or the loss of topsoil? | ☐ | ☐ | ☐ | ☒ |
| c) Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse? | ☐ | ☐ | ☒ | ☐ |
| d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property? | ☐ | ☐ | ☐ | ☒ |
| e) Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water? | ☐ | ☐ | ☐ | ☒ |
| f) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature? | ☐ | ☐ | ☐ | ☒ |

a,b,d,e,f) No impacts to geology and soils are anticipated. All proposed project elements will be constructed in areas that are already entirely paved. No above-ground structures or septic tanks are proposed.

c) According to the Earthquake Zones of Required Investigation Map by the California Geological Survey, the project is located in an area susceptible to liquefaction, The implementation of infiltrating BMPs (i.e., drywells) is not anticipated to increase the liquefaction risk since these BMPs are unlikely to significantly raise the groundwater table or cause groundwater mounding. Refer to the attached geotechnical report for more further discussion of geotechnical impacts.

## 1.8 Greenhouse Gas Emissions

| | **Potentially Significant Impact** | **Less Than Significant with Mitigation Incorporated** | **Less Than Significant Impact** | **No Impact** |
|---|---|---|---|---|
| **VIII. GREENHOUSE GAS EMISSIONS** – Would the project: | | | | |
| a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment? | ☐ | ☐ | ☐ | ☒ |
| b) Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases? | ☐ | ☐ | ☐ | ☒ |

a-b) No permanent impacts are anticipated related to greenhouse gas emissions. None of the proposed project components emit greenhouse gases. There is only temporary potential for generation of greenhouse gases during construction.

## 1.9 Hazards and Hazardous Materials

| | Potentially Significant Impact | Less Than Significant with Mitigation Incorporated | Less Than Significant Impact | No Impact |
|---|---|---|---|---|
| **IX. HAZARDS AND HAZARDOUS MATERIALS** – Would the project: | | | | |
| a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials? | ☐ | ☐ | ☒ | ☐ |
| b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment? | ☐ | ☐ | ☒ | ☐ |
| c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school? | ☐ | ☐ | ☒ | ☐ |
| d) Be located on a site that is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment? | ☐ | ☐ | ☐ | ☒ |
| e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard for people residing or working in the project area? | ☐ | ☐ | ☐ | ☒ |
| f) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan? | ☐ | ☐ | ☐ | ☒ |
| g) Expose people or structures to a significant risk of loss, injury or death involving wildland fires? | ☐ | ☐ | ☐ | ☒ |

a-c) There is currently no known site contamination. A site-specific waste management plan and soil management plan will be developed for the profiling, storage, handling, and disposal of any hazardous materials that may be encountered, which will make the impact less than significant.

e-g) No other impacts related to hazardous materials are anticipated.

## 1.10 Hydrology and Water Quality

| | Potentially Significant Impact | Less Than Significant with Mitigation Incorporated | Less Than Significant Impact | No Impact |
|---|---|---|---|---|
| **X. HYDROLOGY AND WATER QUALITY** – Would the project: | | | | |
| a) Violate any water quality standards or waste discharge requirements? | ☐ | ☐ | ☐ | ☒ |
| b) Substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin? | ☐ | ☐ | ☐ | ☒ |
| c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would: | ☐ | ☐ | ☐ | ☒ |
| i) result in a substantial erosion or siltation on- or off-site; | ☐ | ☐ | ☐ | ☒ |
| ii) substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or offsite; | ☐ | ☐ | ☐ | ☒ |
| iii) create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff; or | ☐ | ☐ | ☐ | ☒ |
| iv) impede or redirect flood flows? | ☐ | ☐ | ☐ | ☒ |
| d) In flood hazard, tsunami, or seiche zones, risk release of pollutants due to project inundation? | ☐ | ☐ | ☐ | ☒ |
| e) Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan? | ☐ | ☐ | ☐ | ☒ |

a-e) No impacts to hydrology and water quality are anticipated. The primary purpose of the project is to improve water supply and water quality through treatment and infiltration of stormwater runoff.

## 1.11 Land Use and Planning

| | Potentially Significant Impact | Less Than Significant with Mitigation Incorporated | Less Than Significant Impact | No Impact |
|---|---|---|---|---|
| **XI. LAND USE AND PLANNING** – Would the project: | | | | |
| a) Physically divide an established community? | ☐ | ☐ | ☐ | ☒ |
| b) Cause a significant environmental impact due to a conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect? | ☐ | ☐ | ☐ | ☒ |

a-b) No impacts to land use and planning are anticipated. The proposed project elements exist entirely within the existing Metro or City right-of-way.

## 1.12 Mineral Resources

| | Potentially Significant Impact | Less Than Significant with Mitigation Incorporated | Less Than Significant Impact | No Impact |
|---|---|---|---|---|
| **XII. MINERAL RESOURCES** – Would the project: | | | | |
| a) Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state? | ☐ | ☐ | ☐ | ☒ |
| b) Result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan, or other land use plan? | ☐ | ☐ | ☐ | ☒ |

a-b) No impacts to mineral resources are anticipated. The entire proposed project area is within an urbanized area.

## 1.13 Noise

| | Potentially Significant Impact | Less Than Significant with Mitigation Incorporated | Less Than Significant Impact | No Impact |
|---|---|---|---|---|
| **XIII. NOISE** – Would the project result in: | | | | |
| a) Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies? | ☐ | ☐ | ☒ | ☐ |
| b) Generation of excessive groundborne vibration or groundborne noise levels? | ☐ | ☐ | ☐ | ☒ |
| c) For a project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels? | ☐ | ☐ | ☐ | ☒ |

a-c) There is potential for temporary noise impacts during construction. A site-specific noise monitoring and control plan will be developed. There will be no permanent noise impacts resulting from the project.

## 1.14 Population and Housing

| | Potentially Significant Impact | Less Than Significant with Mitigation Incorporated | Less Than Significant Impact | No Impact |
|---|---|---|---|---|
| **XIV. POPULATION AND HOUSING** – Would the project: | | | | |
| a) Induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)? | ☐ | ☐ | ☐ | ☒ |
| b) Displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere? | ☐ | ☐ | ☐ | ☒ |

a-b) No impacts to population and housing are anticipated. The proposed project elements exist entirely within the existing Metro and City right-of-way.

## 1.15 Public Services

| | Potentially Significant Impact | Less Than Significant with Mitigation Incorporated | Less Than Significant Impact | No Impact |
|---|---|---|---|---|
| **XIV. PUBLIC SERVICES** | | | | |
| a) Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times, or other performance objectives for any of the public services: | | | | |
| i) Fire protection? | ☐ | ☐ | ☐ | ☒ |
| ii) Police protection? | ☐ | ☐ | ☐ | ☒ |
| iii) Schools? | ☐ | ☐ | ☐ | ☒ |
| iv) Parks? | ☐ | ☐ | ☐ | ☒ |
| v) Other public facilities? | ☐ | ☐ | ☐ | ☒ |

i-v) No impacts to public services are anticipated. The proposed project elements exist entirely within the existing Metro and City right-of-way.

## 1.16 Recreation

| | Potentially Significant Impact | Less Than Significant with Mitigation Incorporated | Less Than Significant Impact | No Impact |
|---|---|---|---|---|
| **XV. RECREATION –** Would the project: | | | | |
| a) Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated? | ☐ | ☐ | ☐ | ☒ |
| b) Does the project Include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment? | ☐ | ☐ | ☐ | ☒ |

a-b) No impacts to recreation are anticipated. The proposed project elements exist entirely within the existing Metro and City right-of-way.

## 1.17 Transportation/Traffic

| | **Potentially Significant Impact** | **Less Than Significant with Mitigation Incorporated** | **Less Than Significant Impact** | **No Impact** |
|---|---|---|---|---|
| **XVII. TRANSPORTATION/TRAFFIC** – Would the project: | | | | |
| a) Conflict with a program, plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities? | ☐ | ☐ | ☐ | ☒ |
| b) Conflict or be inconsistent with CEQA Guidelines § 15064.3, subdivision (b)? | ☐ | ☐ | ☐ | ☒ |
| c) Substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)? | ☐ | ☐ | ☐ | ☒ |
| d) Result in inadequate emergency access? | ☐ | ☐ | ☐ | ☒ |

a-d) No impacts to transportation/traffic are anticipated. The proposed project elements exist entirely within the existing Metro and City right-of-way.

## 1.18 Tribal Cultural Resources

| | **Potentially Significant Impact** | **Less Than Significant with Mitigation Incorporated** | **Less Than Significant Impact** | **No Impact** |
|---|---|---|---|---|
| **XVII. CULTURAL RESOURCES** – Would the project: | | | | |
| a) Would the project cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code § 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is: | ☐ | ☐ | ☐ | ☒ |
| i) Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code section 5020.1(k), or | ☐ | ☐ | ☐ | ☒ |
| ii) A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code § 5024.1. In applying the criteria set forth in subdivision (c) of Public Resource Code § 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe. | ☐ | ☐ | ☐ | ☒ |

a) There are no known tribal cultural resources with the project area.

## 1.19 Utilities and Service Systems

| | **Potentially Significant Impact** | **Less Than Significant with Mitigation Incorporated** | **Less Than Significant Impact** | **No Impact** |
|---|---|---|---|---|
| **XIX. UTILITIES AND SERVICE SYSTEMS** – Would the project: | | | | |
| a) Require or result in the relocation or construction of new or expanded water, wastewater treatment or storm water drainage, electric power, natural gas, or telecommunications facilities, the construction or relocation of which could cause significant environmental effects? | ☐ | ☐ | ☒ | ☐ |
| b) Have sufficient water supplies available to serve the project and reasonably foreseeable future development during normal, dry and multiple dry years? | ☐ | ☐ | ☐ | ☒ |
| c) Result in a determination by the wastewater treatment provider, which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments? | ☐ | ☐ | ☐ | ☒ |
| d) Generate solid waste in excess of state or local standards, or in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals? | ☐ | ☐ | ☐ | ☒ |
| e) Comply with federal, state, and local management and reduction statutes and regulations related to solid waste? | ☐ | ☐ | ☐ | ☒ |

a) New storm water drainage facilities will be constructed, and existing facilities expanded. However, no significant environmental effects are anticipated. The infiltrative nature of the proposed project elements will reduce, not expand, the amount of storm water conveyed in existing drainage facilities.

b-e) No other impacts to utilities and service systems are anticipated. The proposed project elements do not produce wastewater or solid waste.

## 1.20 Wildfire

| | Potentially Significant Impact | Less Than Significant with Mitigation Incorporated | Less Than Significant Impact | No Impact |
|---|---|---|---|---|
| **XX. WILDFIRE** – Would the project: | | | | |
| a) Substantially impair an adopted emergency response plan or emergency evacuation plan? | ☐ | ☐ | ☐ | ☒ |
| b) Due to slope, prevailing winds, and other factors, exacerbate wildfire risks, and thereby expose project occupants to pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire? | ☐ | ☐ | ☐ | ☒ |
| c) Require the installation or maintenance of associated infrastructure (such as roads, fuel breaks, emergency water sources, power lines or other utilities) that may exacerbate fire risk or that may result in temporary or ongoing impacts to the environment? | ☐ | ☐ | ☐ | ☒ |
| d) Expose people or structures to significant risks, including downslope or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes? | ☐ | ☐ | ☐ | ☒ |

a-d) The project will not have a significant impact on wildfire.

## 1.21 Mandatory Findings of Significance

| | Potentially Significant Impact | Less Than Significant with Mitigation Incorporated | Less Than Significant Impact | No Impact |
|---|---|---|---|---|
| **XXI. MANDATORY FINDINGS OF SIGNIFICANCE** | | | | |
| a) Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory? | ☐ | ☐ | ☐ | ☒ |
| b) Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects)? | ☐ | ☐ | ☐ | ☒ |
| c) Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly? | ☐ | ☐ | ☐ | ☒ |

a-c) No impacts are anticipated. The primary purpose of the proposed project is to improve the quality of the environment through treating and infiltrating stormwater runoff.

# APPENDIX A
## CEQA Permitting Process Overview

# Measure W

# Orange Line and East San Fernando Valley Transit Corridor Water Infiltration and Quality Project

## Geosyntec Consultants

6167 Bristol Parkway, Suite 390
Culver City, CA  90230

**Prepared by:**

**MugenKioku Corporation**
703 Pier Avenue
Suite B306
Hermosa Beach, CA  90254

**September 2020**
**MugenKioku Project No. 20001**

# TABLE OF CONTENTS

## LIST OF ATTACHMENTS

Attachment A – Initial Study Checklist

Attachment B – Notice of Exemption Form

Attachment C – Notice of Determination Form

Attachment D – City of Los Angeles CEQA Flow Chart

## SOURCES

*CEQA Document Types*. (n.d.). California Department of Transportation | Caltrans. https://dot.ca.gov/-/media/dot-media/programs/environmental-analysis/documents/ser/fs-ceqa-document-types-a11y.pdf

*CEQA Flow Chart*. (n.d.). Los Angeles City Planning. https://planning.lacity.org/odocument/e524a6c4-8de9-449a-87e5-b5093d65c4c2/CEQA_flow_chart.pdf

*Environmental Frequently Asked Questions*. (n.d.). Sacramento County Planning & Environmental Review. https://planning.saccounty.net/applicants/Pages/FAQ_ER.aspx#Q12

# SECTION 1
## Introduction

### 1.1 Scope

MugenKioku Corporation (MugenKioku) was tasked by Geosyntec Consultants (Geosyntec) to provide information regarding the California Environmental Quality Act (CEQA) permitting process for a proposed Los Angeles County Metropolitan Transportation Authority (Metro) feasibility study in consideration for grant approval under Measure W. The study requires the selection of stormwater infiltration drywell sites along with associated stormwater treatment and capture structures for which the CEQA permitting process may apply.

### 1.2 Project Location

The project is currently proposed for seven locations along the Metro Orange Line and five locations along the East San Fernando Valley Transit Corridor.

### 1.3 Defining a California Environmental Quality Act (CEQA) Project

The purpose of CEQA is to disclose significant environmental effects of a proposed project to the public through either an Initial Study, Negative Declaration, or Environmental Impact Report (EIR). CEQA is intended to enhance public participation in the environmental review process and minimize damage to the environment via mitigation measures and project alternatives.

The California Code of Regulations (CCR), Title 14, Division 6, Chapter 3 contains the guidelines to be followed for CEQA. 14 CCR §15378 considers a “project” to be an action that has the potential to result in direct physical change to the environment or foreseeable indirect change to the environment.

When determining CEQA applicability, the project must first be categorized as discretionary or ministerial. A discretionary project requires deliberation by a public agency (e.g. for approval or permitting). Conversely, a ministerial project only requires conformance with a fixed standard and limited judgement by a public official (e.g. landscaping changes, roof replacements). CEQA applies only to discretionary projects, not to ministerial projects. A project that requires ministerial approval only involves comparison with specific standards for compliance. *In summary, the first step in determining the applicability of CEQA to this feasibility study is to distinguish whether the project is discretionary or ministerial.*

## 1.4 Lead Agency/Responsible Agency

The lead agency and the responsible agency (or agencies) must be established for a project that requires CEQA approval .

The lead agency as defined in 14 CCR §15367 is the public agency that has the principal responsibility for carrying out or approving a project under CEQA. The lead agency also decides whether a negative declaration or an EIR is required. For this feasibility study, Metro is the lead agency.

The responsible agencies as defined in 14 CCR §15381 are all public agencies other than the lead agency which have discretionary approval power over the project. These are the agencies for which the lead agency prepared the EIR or negative declaration. For this project, the responsible agencies are the City of Los Angeles and the County of Los Angeles.

# SECTION 2
# CEQA PROCESS SUMMARY

## 2.1 **Introduction**

If the feasibility study is determined to be a discretionary project, the next step in the CEQA process is to determine whether the project qualifies for a statutory or categorical exemption. If neither exemption applies, then an initial study is required, as explained in Section 2.4. below.

## 2.2 **Statutory Exemption**

Statutory exemptions are defined in 14 CCR §15260-15285. Projects deemed to meet the applicable criteria of a statutory exemption are exempt from CEQA review. Per 14 CCR Section 15262, *Feasibility and Planning Studies*, "A project involving only feasibility or planning studies for possible future actions which the agency, board, or commission has not approved, adopted, or funded does not require the preparation of an EIR or negative declaration but does require consideration of environmental factors. This section does not apply to the adoption of a plan that will have a legally binding effect on later activities." *If a public agency is funding the feasibility study, however, it may not qualify for this exemption. Therefore, the entity funding the feasibility study must be considered when determining exemption applicability.*

The City of Los Angeles CEQA Guidelines similarly state, in Article II 2(d), that an exemption can apply for "Feasibility and planning studies for possible future action, although such studies shall include consideration of environmental factors."

The City of Los Angeles has provided a flow diagram of the CEQA process (provided in Attachment D). The steps pertaining to the Statutory Exemption applicability determination and approval process are summarized below:

1. Prepare a Notice of Exemption (NOE).
2. Determine whether the project is exempt from CEQA.
3. Notice of Exemption is filed with the County Clerk.

## 2.3 **Categorical Exemption**

Categorical exemptions apply to 33 classes as defined in 14 CCR § 15300-15333. However, there are instances (Classes 3, 4, 5, 6, or 11) where the project may not qualify for the exemption, even though the project fits into one of the categories. These classes will not apply where the project may impact an area of special significance that has been designated, precisely mapped, and officially adopted pursuant to law by federal, state, or local agencies.

The flow diagram in Attachment D provides guidance pertaining to the Categorical Exemption determination and approval process, summarized below:

1. If an exception applies, prepare an Initial Study to determine appropriate levels of review.

2. If an exception does not apply:
    a. Prepare a Notice of Exemption (NOE).
    b. Determine whether the project is exempt from CEQA.
    c. Notice of Exemption is filed with the County Clerk.

### 2.4 **Initial Study**

If the project does not qualify for one of the aforementioned exemptions, an initial study is required. The initial study is considered a preliminary analysis of the project and is conducted to assess the potential impact of the project to the environment. Additionally, the initial study provides a summary on if subsequent mitigation measures are needed to reduce environmental impacts. The initial study checklist is included within this report as Attachment A. The following environmental categories are reviewed during the study:

- Aesthetics
- Agriculture and Forestry
- Air Quality
- Biological Resources
- Cultural Resources
- Energy
- Geology/Soils
- Greenhouse Gas Emissions
- Hazards and Hazardous Materials
- Hydrology/Water Quality
- Land Use/Planning
- Mineral Resources
- Noise
- Population/Housing
- Public Services
- Recreation
- Transportation/Traffic
- Tribal Cultural Resources
- Utilities/Service Systems
- Wildfire
- Mandatory Findings of Significance

## 2.5 Negative Declaration/Mitigated Negative Declaration

If the initial study concludes that none of the impacts are significant, a Negative Declaration can be prepared for the project. Otherwise, if the initial study determines that the environmental impacts can be mitigated to less than significant levels, a Mitigated Negative Declaration can be prepared. Per CEQA guidelines, the initial study with the associated Negative Declaration or Mitigated Negative Declaration must be made available to the public for a 30-day review period.

The City of Los Angeles has provided the following guidance for completing a Negative Declaration or Mitigated Negative Declaration.

**Negative Declaration:**

1. Prepare an Initial Study. If the project does not have any potential significant impacts to the environment, then prepare a Negative Declaration.
2. Prepare a Negative Declaration.
3. Publish Notice of Intent to adopt for public review (20 or 30 days).
4. If project is approved, adopt the Negative Declaration.
5. File Notice of Determination with the Los Angeles County Clerk.

**Mitigated Negative Declaration:**

1. Prepare an Initial Study. If the project does have potential significant impacts to the environment, determine whether all significant impacts can be mitigated to less than significant levels.
2. If significant impacts can be mitigated to less than significant levels, prepare a Mitigated Negative Declaration.
3. Publish Notice of Intent to adopt for public review (20 or 30 days).
4. Adopt the Mitigated Negative Declaration.
5. File a Notice of Determination with the Los Angeles County Clerk.

## 2.6 Environmental Impact Report

The Environmental Impact Report (EIR) is developed when the project will or may have significant impacts to any environmental category that cannot be mitigated to less than significant levels. The EIR contains a thorough and complete environmental synopsis of the project that showcases the overall environmental impact analysis that the project has on its surrounding areas.

The City of Los Angeles has provided the following guidance for completing an EIR:

1. If the project does not qualify for an exemption, prepare an Initial Study.

2. If the project is determined to have potential significant impacts to the environment, and these impacts cannot be mitigated to less than significant levels, issue a Notice of Preparation of EIR.
3. Conduct scoping meeting (if required) and initiate 30-day public scoping period.
4. Prepare and release the draft EIR, file the Notice of Completion, and issue the Notice of Availability for public comment (30 to 60 days).
5. Respond to comments, make any edits, and prepare the final EIR.
6. Issue the final EIR and release the EIR for public inspection.
7. If the project is approved, certify the EIR.
8. File Notice of Determination with the Los Angeles County Clerk.

# SECTION 3
# ADDITIONAL COMPLIANCE MEASURES

When construction commences along the Orange Line and East San Fernando Transit locations the following permits and/or environmental concerns may need to be addressed:

1. Grading and construction permits will need to be attained from the City of Los Angeles, as a majority of the proposed locations are within City's limits.[1]
    - Per the Los Angeles City Building Permit Handbook, CEQA Clearance is required for proposed grading when work in excess of 20,000 cubic yards of either cutting or filling is done on slopes steeper than 1 vertical in 10 horizontal.

2. Encroachment permits must be filed with the City of Los Angeles Bureau of Engineering, since most of the locations are near/within the public right of way.

3. Bureau of Sanitation (BOS) Stormwater Low Impact Development (LID) ordinance clearance is required for:

    - Projects which increase or replace impervious areas of 500 square feet or more due to any land disturbance (foundation, grading, etc.);
    - New construction;
    - Additions (> 500 square feet of impervious area);
    - Re-grading of parking lots >500 square feet; and
    - Impervious pads >500 square feet (i.e. equipment pads).

4. If one or more acres of soil will be disturbed, a State Water Resources Control Board Construction Permit is required.

5. During the construction phase of the project, the project must maintain compliance with SCAQMD Rule 403 (preventing, reducing, or mitigating fugitive dust emissions from constructions activities as required).

---

[1] If locations of construction are not located within the City of Los Angeles, obtain appropriate guidance and permitting requirements from the affected city.

# ATTACHMENT A

## Initial Study Checklist

# CITY OF LOS ANGELES

OFFICE OF THE CITY CLERK
ROOM 360, CITY HALL
LOS ANGELES, CALIFORNIA 90012

## CALIFORNIA ENVIRONMENTAL QUALITY ACT

# INITIAL STUDY
# AND CHECKLIST

| LEAD CITY AGENCY | COUNCIL DISTRICT | DATE |
|---|---|---|
| City of Los Angeles Department of City Planning | | |

**RESPONSIBLE AGENCIES**

| PROJECT TITLE/NO. | CASE NO. |
|---|---|
| | |

| PREVIOUS ACTIONS CASE NO. | |
|---|---|
| | ☐ **DOES have significant changes from previous actions.**<br>☐ **DOES NOT have significant changes from previous actions.** |

**PROJECT DESCRIPTION:**

**ENVIRONMENTAL SETTING:**

**PROJECT LOCATION**

| PLANNING DISTRICT | STATUS: |
|---|---|
| | ☐ **PRELIMINARY**<br>☐ **PROPOSED** ______ ____________<br>☐ **ADOPTED** |

| | | |
|---|---|---|
| **EXISTING ZONING** | **MAX. DENSITY ZONING** | ☐ **DOES CONFORM TO PLAN** |
| **PLANNED LAND USE & ZONE** | **MAX. DENSITY PLAN** | ☐ **DOES NOT CONFORM TO PLAN** |
| **SURROUNDING LAND USES** | **PROJECT DENSITY** | ☐ **NO DISTRICT PLAN** |

☞ ☐ **DETERMINATION (To be completed by Lead Agency)**

**On the basis of this initial evaluation:**

☐ I find that the proposed project COULD NOT have a significant effect on the environment, and a NEGATIVE DECLARATION will be prepared.

☐ I find that although the proposed project could have a significant effect on the environment, there will not be a significant effect in this case because revisions on the project have been made by or agreed to by the project proponent. A MITIGATED NEGATIVE DECLARATION will be prepared.

☐ I find the proposed project MAY have a significant effect on the environment, and an ENVIRONMENTAL IMPACT REPORT is required.

☐ I find the proposed project MAY have a "potentially significant impact" or "potentially significant unless mitigated" impact on the environment, but at least one effect 1) has been adequately analyzed in an earlier document pursuant to applicable legal standards, and 2) has been addressed by mitigation measures based on earlier analysis as described on attached sheets. An ENVIRONMENTAL IMPACT REPORT is required, but it must analyze only the effects that remain to be addressed.

☐ I find that although the proposed project could have a significant effect on the environment, because all potentially significant effects (a) have been analyzed adequately in an earlier EIR or NEGATIVE DECLARATION pursuant to applicable standards, and (b) have been avoided or mitigated pursuant to that earlier EIR or NEGATIVE DECLARATION, including revisions or mitigation measures that are imposed upon the proposed project, nothing further is required.

| | |
|---|---|
| ______________________________ | ______________________________ |
| **SIGNATURE** | **TITLE** |

## EVALUATION OF ENVIRONMENTAL IMPACTS:

1) A brief explanation is required for all answers except "No Impact" answers that are adequately supported by the information sources a lead agency cites in the parentheses following each question. A "No Impact" answer is adequately supported if the referenced information sources show that the impact simply does not apply to projects like the one involved (e.g., the project falls outside a fault rupture zone). A "No Impact" answer should be explained where it is based on project-specific factors as well as general standards (e.g., the project will not expose sensitive receptors to pollutants based on a project-specific screening analysis).

2) All answers must take account of the whole action involved, including off-site as well as on-site, cumulative as well as project-level, indirect as well as direct, and construction as well as operational impacts.

3) Once the lead agency has determined that a particular physical impact may occur, then the checklist answers must indicate whether the impact is potentially significant, less that significant with mitigation, or less than significant. "Potentially Significant Impact" is appropriate if there is substantial evidence that an effect may be significant. If there are one or more "Potentially Significant Impact" entries when the determination is made, an EIR is required.

4) "Negative Declaration: Less Than Significant With Mitigation Incorporated" applies where the incorporation of a mitigation measure has reduced an effect from "Potentially Significant Impact" to "Less Than Significant Impact." The lead agency must describe the mitigation measures, and briefly explain how they reduce the effect to a less than significant level (mitigation measures from Section XVII, "Earlier Analysis," cross referenced).

5) Earlier analysis must be used where, pursuant to the tiering, program EIR, or other CEQA process, an effect has been adequately analyzed in an earlier EIR, or negative declaration. Section 15063 (c)(3)(D). In this case, a brief discussion should identify the following:
    a) Earlier Analysis Used. Identify and state where they are available for review.
    b) Impacts Adequately Addressed. Identify which effects from the above checklist were within the scope of and adequately analyzed in an earlier document pursuant to applicable legal standards, and state whether such effects were addressed by mitigation measures based on the earlier analysis.
    c) Mitigation Measures. For effects that are "Less Than Significant With Mitigation Measures Incorporated," describe the mitigation measures which were incorporated or refined from the earlier document and the extent to which they address site-specific conditions for the project.

6) Lead agencies are encouraged to incorporate into the checklist references to information sources for potential impacts (e.g., general plans, zoning ordinances). Reference to a previously prepared or outside document should, where appropriate, include a reference to the page or pages where the statement is substantiated

7) Supporting Information Sources: A sources list should be attached, and other sources used or individuals contacted should be cited in the discussion.

8) This is only a suggested form, and lead agencies are free to use different formats; however, lead agencies should normally address the questions from this checklist that are relevant to a project's environmental effects in whichever format is selected.

9) The explanation of each issue should identify:
    a. The significance criteria or threshold, if any, used to evaluate each question; and
    b. The mitigation measure identified, if any, to reduce the impact to less than significance.

## ENVIRONMENTAL FACTORS POTENTIALLY AFFECTED:

The environmental factors checked below would be potentially affected by this project, involving at least one impact that is a “Potentially Significant Impact” as indicated by the checklist on the following pages.

- ☐ Aesthetics
- ☐ Biological Resources
- ☐ Geology/Soils
- ☐ Hydrology/Water Quality
- ☐ Noise
- ☐ Recreation
- ☐ Utilities/Service Systems
- ☐ Agricultural and Forestry Resources
- ☐ Cultural Resources
- ☐ Greenhouse Gas Emissions
- ☐ Land Use/Planning
- ☐ Population/Housing
- ☐ Transportation/Traffic
- ☐ Wildfire
- ☐ Air Quality
- ☐ Energy
- ☐ Hazards & Hazardous Materials
- ☐ Mineral Resources
- ☐ Public Services
- ☐ Tribal Cultural Resources
- ☐ Mandatory Findings of Significance

---

## INITIAL STUDY CHECKLIST (To be completed by the Lead City Agency)

### ☞ ☐ BACKGROUND

**PROPONENT NAME**

**PHONE NUMBER**

**PROPONENT ADDRESS**

**AGENCY REQUIRING CHECKLIST**

**DATE SUBMITTED**

**PROPOSAL NAME (If Applicable)**

## ☞ ☐ ENVIRONMENTAL IMPACTS

(Explanations of all potentially and less than significant impacts are required to be attached on separate sheets)

| | Potentially Significant Impact | Less Than Significant with Mitigation Incorporated | Less Than Significant Impact | No Impact |
|---|---|---|---|---|
| **I. AESTHETICS.** Except as provided in Public Resources Code Section 21099, would the project: | | | | |
| a. Have a substantial adverse effect on a scenic vista? | ☐ | ☐ | ☐ | ☐ |
| b. Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway? | ☐ | ☐ | ☐ | ☐ |
| c. In non-urbanized areas, substantially degrade the existing visual character or quality of public views of the site and its surroundings? If the project is in an urbanized area, would the project conflict with applicable zoning and other regulations governing scenic quality? | ☐ | ☐ | ☐ | ☐ |
| d. Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area? | ☐ | ☐ | ☐ | ☐ |
| **II. AGRICULTURE AND FOREST RESOURCES.** In determining whether impacts to agricultural resources are significant environmental effects, lead agencies may refer to the California Agricultural Land Evaluation and Site Assessment Model (1997) prepared by the California Department of Conservation as an optional model to use in assessing impacts on agriculture and farmland. In determining whether impacts to forest resources, including timberland, are significant environmental effects, lead agencies may refer to information compiled by the California Department of Forestry and Fire Protection regarding the state's inventory of forest land, including the Forest and Range Assessment Project and the Forest Legacy Assessment project; and forest carbon measurement methodology provided in Forest Protocols adopted by the California Air Resources Board. Would the project: | | | | |
| a. Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use? | ☐ | ☐ | ☐ | ☐ |
| b. Conflict with existing zoning for agricultural use, or a Williamson Act contract? | ☐ | ☐ | ☐ | ☐ |
| c. Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220(g)), timberland (as defined by Public Resources Code section 4526), or timberland zoned Timberland Production (as defined by Government Code section 51104(g))? | ☐ | ☐ | ☐ | ☐ |

|  | Potentially Significant Impact | Less Than Significant with Mitigation Incorporated | Less Than Significant Impact | No Impact |
|---|---|---|---|---|
| d. Result in the loss of forest land or conversion of forest land to non-forest use? | ☐ | ☐ | ☐ | ☐ |
| e. Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use or conversion of forest land to non-forest use? | ☐ | ☐ | ☐ | ☐ |
| **III. AIR QUALITY.** Where available, the significance criteria established by the applicable air quality management or air pollution control district may be relied upon to make the following determinations. Would the project: |  |  |  |  |
| a. Conflict with or obstruct implementation of the applicable air quality plan? | ☐ | ☐ | ☐ | ☐ |
| b. Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard? | ☐ | ☐ | ☐ | ☐ |
| c. Expose sensitive receptors to substantial pollutant concentrations? | ☐ | ☐ | ☐ | ☐ |
| d. Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people? | ☐ | ☐ | ☐ | ☐ |
| **IV. BIOLOGICAL RESOURCES.** Would the project: |  |  |  |  |
| a. Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service? | ☐ | ☐ | ☐ | ☐ |
| b. Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, or regulations, by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service? | ☐ | ☐ | ☐ | ☐ |
| c. Have a substantial adverse effect on state or federally protected wetlands (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means? | ☐ | ☐ | ☐ | ☐ |
| d. Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites? | ☐ | ☐ | ☐ | ☐ |

| | Potentially Significant Impact | Less Than Significant with Mitigation Incorporated | Less Than Significant Impact | No Impact |
|---|---|---|---|---|
| e. Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance? | ☐ | ☐ | ☐ | ☐ |
| f. Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan? | ☐ | ☐ | ☐ | ☐ |
| **V. CULTURAL RESOURCES.** Would the project: | | | | |
| a. Cause a substantial adverse change in the significance of a historical resource as defined in §15064.5? | ☐ | ☐ | ☐ | ☐ |
| b. Cause a substantial adverse change in the significance of an archaeological resource pursuant to §15064.5? | ☐ | ☐ | ☐ | ☐ |
| c. Disturb any human remains, including those interred outside of dedicated cemeteries (see Public Resources Code, Ch. 1.75, §5097.98, and Health and Safety Code §7050.5(b))? | ☐ | ☐ | ☐ | ☐ |
| **VI. ENERGY.** Would the project: | | | | |
| a. Result in a potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation? | ☐ | ☐ | ☐ | ☐ |
| b. Conflict with or obstruct a state or local plan for renewable energy or energy efficiency? | ☐ | ☐ | ☐ | ☐ |
| **VII. GEOLOGY AND SOILS.** Would the project: | | | | |
| a. Directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury or death involving: | | | | |
| i. Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42. | ☐ | ☐ | ☐ | ☐ |
| ii. Strong seismic ground shaking? | ☐ | ☐ | ☐ | ☐ |
| iii. Seismic-related ground failure, including liquefaction? | ☐ | ☐ | ☐ | ☐ |
| iv. Landslides? | ☐ | ☐ | ☐ | ☐ |
| b. Result in substantial soil erosion or the loss of topsoil? | ☐ | ☐ | ☐ | ☐ |
| c. Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse? | ☐ | ☐ | ☐ | ☐ |

| | Potentially Significant Impact | Less Than Significant with Mitigation Incorporated | Less Than Significant Impact | No Impact |
|---|---|---|---|---|
| d. Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property? | ☐ | ☐ | ☐ | ☐ |
| e. Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water? | ☐ | ☐ | ☐ | ☐ |
| f. Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature? | ☐ | ☐ | ☐ | ☐ |
| **VIII. GREENHOUSE GAS EMISSIONS.** Would the project: | | | | |
| a. Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment? | ☐ | ☐ | ☐ | ☐ |
| b. Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases? | ☐ | ☐ | ☐ | ☐ |
| **IX. HAZARDS AND HAZARDOUS MATERIALS.** Would the project: | | | | |
| a. Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials? | ☐ | ☐ | ☐ | ☐ |
| b. Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment? | ☐ | ☐ | ☐ | ☐ |
| c. Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school? | ☐ | ☐ | ☐ | ☐ |
| d. Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment? | ☐ | ☐ | ☐ | ☐ |
| e. For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard or excessive noise for people residing or working in the project area? | ☐ | ☐ | ☐ | ☐ |
| f. Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan? | ☐ | ☐ | ☐ | ☐ |
| g. Expose people or structures, either directly or indirectly, to a significant risk of loss, injury or death involving wildland fires? | ☐ | ☐ | ☐ | ☐ |

| | Potentially Significant Impact | Less Than Significant with Mitigation Incorporated | Less Than Significant Impact | No Impact |
|---|---|---|---|---|
| **X. HYDROLOGY AND WATER QUALITY.** Would the project: | | | | |
| a. Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or groundwater quality? | ☐ | ☐ | ☐ | ☐ |
| b. Substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin? | ☐ | ☐ | ☐ | ☐ |
| c. Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would: | ☐ | ☐ | ☐ | ☐ |
| i. Result in substantial erosion or siltation on- or off-site; | | | | |
| ii. Substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site; | | | | |
| iii. Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff; or | | | | |
| iv. Impede or redirect flood flows? | | | | |
| d. In flood hazard, tsunami, or seiche zones, risk release of pollutants due to project inundation? | ☐ | ☐ | ☐ | ☐ |
| e. Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan? | ☐ | ☐ | ☐ | ☐ |
| **XI. LAND USE AND PLANNING.** Would the project: | | | | |
| a. Physically divide an established community? | ☐ | ☐ | ☐ | ☐ |
| b. Cause a significant environmental impact due to a conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect? | ☐ | ☐ | ☐ | ☐ |
| **XII. MINERAL RESOURCES.** Would the project: | | | | |
| a. Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state? | ☐ | ☐ | ☐ | ☐ |
| b. Result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan? | ☐ | ☐ | ☐ | ☐ |

| | Potentially Significant Impact | Less Than Significant with Mitigation Incorporated | Less Than Significant Impact | No Impact |
|---|---|---|---|---|
| **XIII. NOISE.** | | | | |
| a. Would the project result in generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies? | ☐ | ☐ | ☐ | ☐ |
| b. Would the project result in generation of excessive groundborne vibration or groundborne noise levels? | ☐ | ☐ | ☐ | ☐ |
| c. For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels? | ☐ | ☐ | ☐ | ☐ |
| **XIV. POPULATION AND HOUSING.** Would the project: | | | | |
| a. Induce substantial unplanned population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)? | ☐ | ☐ | ☐ | ☐ |
| b. Displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere? | ☐ | ☐ | ☐ | ☐ |
| **XV. PUBLIC SERVICES.** Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services: | | | | |
| a. Fire protection? | ☐ | ☐ | ☐ | ☐ |
| b. Police protection? | ☐ | ☐ | ☐ | ☐ |
| c. Schools? | ☐ | ☐ | ☐ | ☐ |
| d. Parks? | ☐ | ☐ | ☐ | ☐ |
| e. Other public facilities? | ☐ | ☐ | ☐ | ☐ |
| **XVI. RECREATION.** | | | | |
| a. Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated? | ☐ | ☐ | ☐ | ☐ |

| | Potentially Significant Impact | Less Than Significant with Mitigation Incorporated | Less Than Significant Impact | No Impact |
|---|---|---|---|---|
| b. Does the project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment? | ☐ | ☐ | ☐ | ☐ |
| c. Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered park facilities, need for new or physically altered park facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, or other performance objectives for parks | ☐ | ☐ | ☐ | ☐ |
| **XVII. TRANSPORTATION/TRAFFIC.** Would the project: | | | | |
| a. Conflict with a program, plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities? | ☐ | ☐ | ☐ | ☐ |
| b. Conflict or be inconsistent with CEQA Guidelines Section 15064.3, subdivision (b)? | ☐ | ☐ | ☐ | ☐ |
| c. Substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)? | ☐ | ☐ | ☐ | ☐ |
| d. Result in inadequate emergency access? | ☐ | ☐ | ☐ | ☐ |
| **XVIII. TRIBAL CULTURAL RESOURCES.** Would the project: | | | | |
| a. Cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code Section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is:<br>i. Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code Section 5020.1(k), or<br>ii. A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code Section 5024.1? In applying the criteria set forth in subdivision (c) of Public Resources Code Section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe. | ☐ | ☐ | ☐ | ☐ |

|  | Potentially Significant Impact | Less Than Significant with Mitigation Incorporated | Less Than Significant Impact | No Impact |
|---|---|---|---|---|
| **XIX. UTILITIES AND SERVICE SYSTEMS.** Would the project: |  |  |  |  |
| a. Have sufficient water supplies available to serve the project and reasonable foreseeable future development during normal, dry and multiple dry years? | ☐ | ☐ | ☐ | ☐ |
| b. Result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments? | ☐ | ☐ | ☐ | ☐ |
| c. Generate solid waste in excess of State or local standards, or in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals? | ☐ | ☐ | ☐ | ☐ |
| d. Comply with federal, state, and local management and reduction statutes and regulations related to solid waste? | ☐ | ☐ | ☐ | ☐ |
| **XX. WILDFIRE.** If located in or near state responsibility areas or lands classified as very high fire hazard severity zones, would the project: |  |  |  |  |
| a. Substantially impair an adopted emergency response plan or emergency evacuation plan? | ☐ | ☐ | ☐ | ☐ |
| b. Due to slope, prevailing winds, and other factors, exacerbate wildfire risks, and thereby expose project occupants to, pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire? | ☐ | ☐ | ☐ | ☐ |
| c. Require the installation or maintenance of associated infrastructure (such as roads, fuel breaks, emergency water sources, power lines or other utilities) that may exacerbate fire risk or that may result in temporary or ongoing impacts to the environment? | ☐ | ☐ | ☐ | ☐ |
| d. Expose people or structures to significant risks, including downslope or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes? | ☐ | ☐ | ☐ | ☐ |
| **XXI. MANDATORY FINDINGS OF SIGNIFICANCE.** |  |  |  |  |
| a. Does the project have the potential to substantially degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, substantially reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory? | ☐ | ☐ | ☐ | ☐ |

| | Potentially Significant Impact | Less Than Significant with Mitigation Incorporated | Less Than Significant Impact | No Impact |
|---|---|---|---|---|
| b. Does the project have impacts that are individually limited, but cumulatively considerable? (“Cumulatively considerable” means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects). | ☐ | ☐ | ☐ | ☐ |
| c. Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly? | ☐ | ☐ | ☐ | ☐ |

☞ ☐ **DISCUSSION OF THE ENVIRONMENTAL EVALUATION** **(Attach additional sheets if necessary)**

| **PREPARED BY** | **TITLE** | **TELEPHONE #** | **DATE** |
|---|---|---|---|
| | | | |

# ATTACHMENT B

Notice of Exemption Form

Print Form

# Notice of Exemption

**Appendix E**

**To:** Office of Planning and Research
P.O. Box 3044, Room 113
Sacramento, CA 95812-3044

County Clerk
County of: ____________________
______________________________
______________________________

**From:** (Public Agency): ______________________________
____________________________________________________
____________________________________________________
(Address)

Project Title: ____________________________________________________________

Project Applicant: ____________________________________________________________

Project Location - Specific:

Project Location - City: ______________________ Project Location - County: ______________________

Description of Nature, Purpose and Beneficiaries of Project:

Name of Public Agency Approving Project: ______________________________________________

Name of Person or Agency Carrying Out Project: ______________________________________________

Exempt Status: **(check one):**

- ☐ Ministerial (Sec. 21080(b)(1); 15268);
- ☐ Declared Emergency (Sec. 21080(b)(3); 15269(a));
- ☐ Emergency Project (Sec. 21080(b)(4); 15269(b)(c));
- ☐ Categorical Exemption. State type and section number: ______________________________
- ☐ Statutory Exemptions. State code number: ______________________________

Reasons why project is exempt:

Lead Agency
Contact Person: ______________________________ Area Code/Telephone/Extension: ________________

**If filed by applicant:**

1. Attach certified document of exemption finding.
2. Has a Notice of Exemption been filed by the public agency approving the project? ☐ Yes ☐ No

Signature: ______________________________ Date: ______________ Title: ________________________

☐ Signed by Lead Agency ☐ Signed by Applicant

Authority cited: Sections 21083 and 21110, Public Resources Code.
Reference: Sections 21108, 21152, and 21152.1, Public Resources Code.

Date Received for filing at OPR: _______________

Revised 2011

# ATTACHMENT C

Notice of Determination Form

Print Form

# Notice of Determination

**Appendix D**

**To:**
☐ Office of Planning and Research

| | |
|---|---|
| *U.S. Mail:* | *Street Address:* |
| P.O. Box 3044 | 1400 Tenth St., Rm 113 |
| Sacramento, CA 95812-3044 | Sacramento, CA 95814 |

☐ County Clerk
County of: ______________________
Address: ______________________
______________________

**From:**
Public Agency: ______________________
Address: ______________________
______________________
Contact: ______________________
Phone: ______________________

Lead Agency (if different from above):
______________________
Address: ______________________
______________________
Contact: ______________________
Phone: ______________________

***SUBJECT: Filing of Notice of Determination in compliance with Section 21108 or 21152 of the Public Resources Code.***

State Clearinghouse Number (if submitted to State Clearinghouse): ______________________

Project Title: ______________________

Project Applicant: ______________________

Project Location (include county): ______________________

Project Description:

This is to advise that the ______________________ has approved the above
(☐ Lead Agency or ☐ Responsible Agency)

described project on ____________ and has made the following determinations regarding the above
(date)
described project.

1. The project [☐ will ☐ will not] have a significant effect on the environment.
2. ☐ An Environmental Impact Report was prepared for this project pursuant to the provisions of CEQA.
   ☐ A Negative Declaration was prepared for this project pursuant to the provisions of CEQA.
3. Mitigation measures [☐ were ☐ were not] made a condition of the approval of the project.
4. A mitigation reporting or monitoring plan [☐ was ☐ was not] adopted for this project.
5. A statement of Overriding Considerations [☐ was ☐ was not] adopted for this project.
6. Findings [☐ were ☐ were not] made pursuant to the provisions of CEQA.

This is to certify that the final EIR with comments and responses and record of project approval, or the negative Declaration, is available to the General Public at:

______________________

Signature (Public Agency): ______________________ Title: ______________________

Date: ______________________ Date Received for filing at OPR: ______________________

Authority cited: Sections 21083, Public Resources Code.
Reference Section 21000-21174, Public Resources Code.

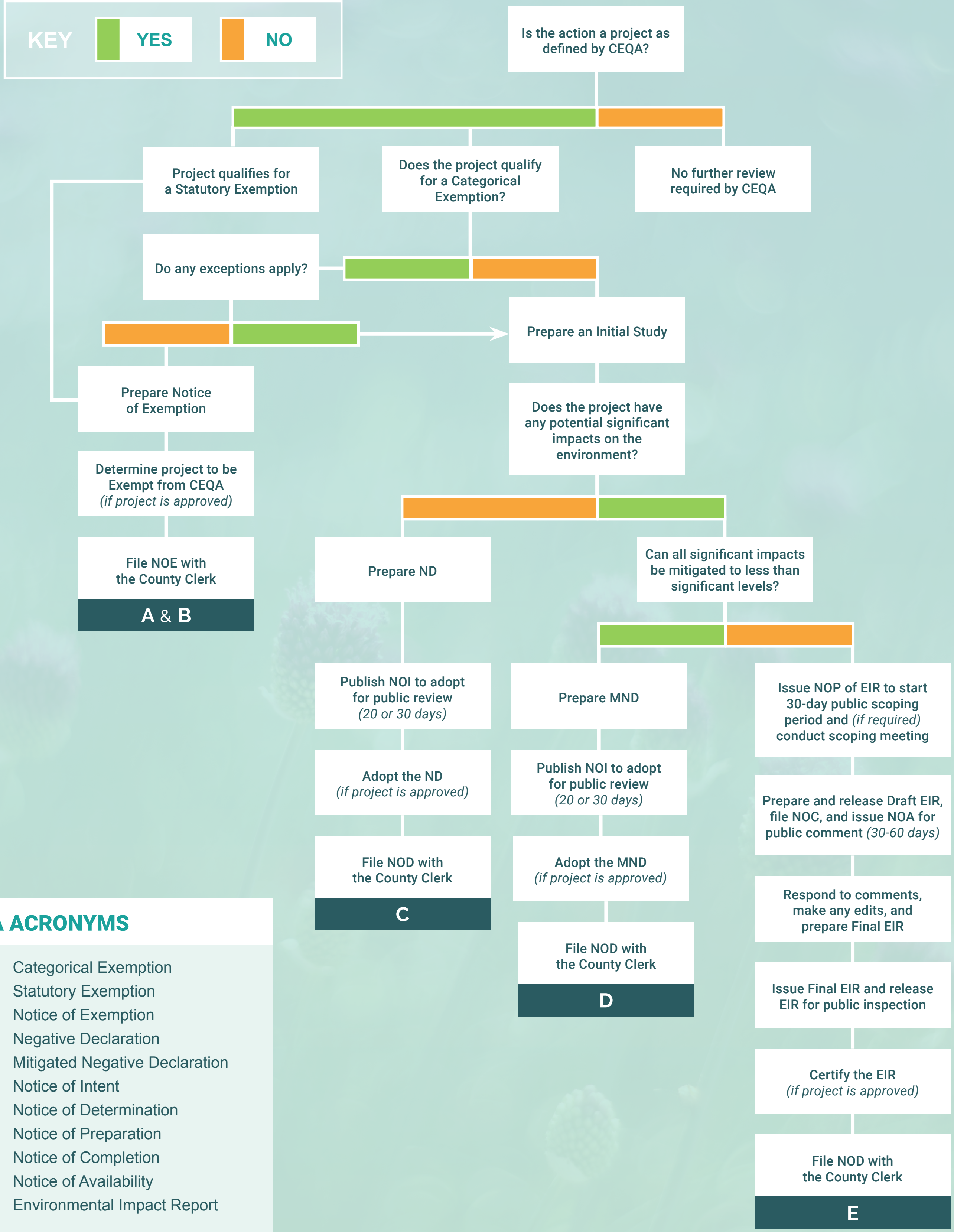
Revised 2011

# ATTACHMENT D

## City of Los Angeles CEQA Flow Chart

PLANNING
**101**

# CALIFORNIA ENVIRONMENTAL QUALITY ACT
## FLOW CHART



**KEY** 🟩 **YES** 🟧 **NO**

Is the action a project as defined by CEQA?

Project qualifies for a Statutory Exemption

Does the project qualify for a Categorical Exemption?

No further review required by CEQA

Do any exceptions apply?

Prepare an Initial Study

Prepare Notice of Exemption

Does the project have any potential significant impacts on the environment?

Determine project to be Exempt from CEQA *(if project is approved)*

File NOE with the County Clerk

**A & B**

Prepare ND

Can all significant impacts be mitigated to less than significant levels?

Publish NOI to adopt for public review *(20 or 30 days)*

Adopt the ND *(if project is approved)*

File NOD with the County Clerk

**C**

Prepare MND

Publish NOI to adopt for public review *(20 or 30 days)*

Adopt the MND *(if project is approved)*

File NOD with the County Clerk

**D**

Issue NOP of EIR to start 30-day public scoping period and *(if required)* conduct scoping meeting

Prepare and release Draft EIR, file NOC, and issue NOA for public comment *(30-60 days)*

Respond to comments, make any edits, and prepare Final EIR

Issue Final EIR and release EIR for public inspection

Certify the EIR *(if project is approved)*

File NOD with the County Clerk

**E**

## CEQA ACRONYMS

| | |
|---|---|
| **CE** | Categorical Exemption |
| **SE** | Statutory Exemption |
| **NOE** | Notice of Exemption |
| **ND** | Negative Declaration |
| **MND** | Mitigated Negative Declaration |
| **NOI** | Notice of Intent |
| **NOD** | Notice of Determination |
| **NOP** | Notice of Preparation |
| **NOC** | Notice of Completion |
| **NOA** | Notice of Availability |
| **EIR** | Environmental Impact Report |

*This flowchart provides a general overview of the CEQA process and is intended to be used for informational purposes only. This flowchart does not address new streamlining tools for projects located within Transit Priority Areas or involve affordable housing.*

# ATTACHMENTS FOR SECTION 8.2:

## VECTOR MINIMIZATION

Geosyntec consultants

engineers | scientists | innovators

Metro

# Vector Minimization Plan

## Metro Orange Line Water Infiltration and Quality Project

# 1. INTRODUCTION

The Metro Orange Line Water Infiltration and Quality Project (Project) proposes to design and implement distributed low impact development (LID) infiltration best management practices (BMPs) within LA Metro parcels and right-of-way (ROW) in the East San Fernando Valley. The Project will coincide with the Metro Orange Line Bus Rail Transit (MOL BRT) Improvement Project, one of Metro's self-funded capital improvement projects. The purpose and need of the Project is to capture and infiltrate stormwater runoff, to improve downstream water quality, help recharge the groundwater basin, and mitigate localized nuisance flooding in disadvantaged communities and neighborhoods with significant unmet needs within the neighboring geographical area. This will be accomplished through the installation of 168 drywells, as well as underground pretreatment facilities, separated into seven geographic clusters.

# 2. VECTOR CONTROL PROCEDURES

Control of mosquitos and other vectors in stormwater management Best Management Practices (BMPs) is critical for protecting public health. The State of California Health and Human Services Agency's Checklist for Minimizing Vector Production in Stormwater Management Structures (Checklist)[1] was used to evaluate opportunities to minimize the proliferation of vectors. The BMPs included in the Project are all categorized as dry systems by the Checklist. The BMPs are designed to drain completely following capture and/or treatment of runoff and they are installed below-grade. In order for the BMPs to function properly, proper operations and maintenance (O&M) of the BMPs will be regularly conducted.

## 2.1 Dry System Checklist

- *Is the structure designed to discharge all captured water in 4 days or less?*
    - Yes, all BMPs are designed to drain fully in 48 hours with proper O&M Plan implementation.
- *Has every effort been made to trace and eliminate persistent non-stormwater flows (e.g. irrigation runoff) that may enter the system and jeopardize non-chemical vector control efforts?*
    - Yes, non-stormwater flows will be identified and investigated during BMP O&M inspections.

---

[1] https://www.cdph.ca.gov/Programs/CID/DCDC/CDPH%20Document%20Library/ChecklistforVectorPreventioninBMPs.pdf

- *Has groundwater depth been carefully evaluated to ensure that the structure will not be permanently or seasonally flooded (i.e. is the base of the basin higher than the local groundwater table)?*
  - Yes, groundwater depths in the Project area are sufficiently deep to prevent permanent or seasonal flooding.
- *Does the design provide an adequate slope between the inlets and outlets, with special attention given to ensure corners are above grade?*
  - Yes, upon final design, flow between from the diversion structure and the BMPs will be designed to provide adequate slope.
- *Has soil been compacted adequately during grading to minimize subsidence, which can result in pools of standing water?*
  - Yes, final grading over the below-grade BMPs will be completed in a manner to prevent ponding at the surface.
- *Does the design slope take into consideration the inevitable accumulation of sediment and debris between maintenance periods that can result in standing water, especially in and around the inlet?*
  - N/A
- *Does the design minimize the use of features that increase the potential for standing water, such as loose riprap and concrete curbs?*
  - Yes, these features are not included in Project BMPs
- *Does the structure include a concrete or earthen low-flow channel to concentrate (i.e. minimize available surface area) and direct non-stormwater flows to the outlet?*
  - N/A, all BMPs are infiltration BMPs, and do not have a surface outlet.
- *Is the distribution piping sloped adequately and smooth (not corrugated) on the inside to prevent standing water?*
  - Yes, final design of piping between BMPs will be smooth to prevent standing water.
- *Are the inlet structures and energy dissipaters designed and sloped sufficiently to prevent scour depressions?*
  - N/A

- *Are the outlets designed with debris screens or other features that reduce the potential for clogging?*
    - N/A, all BMPs are infiltration BMPs, and do not have a surface outlet.
- *Is the structure designed with safe and sufficient access for inspection, maintenance, and/or vector control activities when neede*d?
    - Yes, all BMPs will have maintenance access structures.
- *Does the operation and maintenance plan include a minimum of quarterly inspections to ensure that vegetation overgrowth, sediment accumulation, or other factors have not created areas of standing water?*
    - Yes, the operation and maintenance plan does include quarterly inspections to evaluate BMP condition, including sediment accumulation.
- *Does the operation and maintenance plan include a minimum annual maintenance to remove vegetation overgrowth, remove sediment and debris accumulation, and otherwise return the structure to "as-designed" conditions?*
    - Yes, annual maintenance as detailed in the Project O&M Plan will be conducted to maintain pump stations and pretreatment facilities where most sediment buildup is expected. With proper operation and maintenance conducted at the pretreatment facilities, the drywells will require less frequent O&M (once every five years).
- *Is signage provided and clearly visible with minimum information indicating the type of structure (e.g. extended detention basin), ownership, and contact information?*
    - Yes, visible signature will be constructed to indicate stormwater BMP type (drywells), ownership and contact information

## 3. SUMMARY

The below-grade design  of the BMPs and rapid drawdown rate of two days are expected to mitigate many of the risks for vector proliferation. Additionally,  scheduled maintenance of the BMPs as detailed in the Operation and Maintenance Plan will ensure the BMPs continue to function as designed.

# ATTACHMENTS FOR SECTION 8.6:

## TECHNICAL REPORTS

# ATTACHMENTS FOR SECTION 8.7:

## OTHER

# Drought Tolerant Shrub Palette


Baja Fairy Duster (CA Native)


Ceanothus Joyce Coulter Fairly


Chaparosa (CA Native)


Cistus Sunset


Coffee Berry (CA Native)


Common Buckwheat (CA Native)


Common Yarrow


Dalea Greggii Willow

# Drought Tolerant Shrub Palette


Encelia californica (CA Native)


Evergreen Currant (CA Native)


Flannel Bush (CA Native)


Foothill Penstemon (CA Native)


Honeysuckle (CA Native)


Lantana

(Drought Tolerant when Established)


Lavender

Leucophyllum frutescense

"Compactum"

# Drought Tolerant Shrub Palette

Lobeilia laxiflora
(Fairly Drought Tolerant)

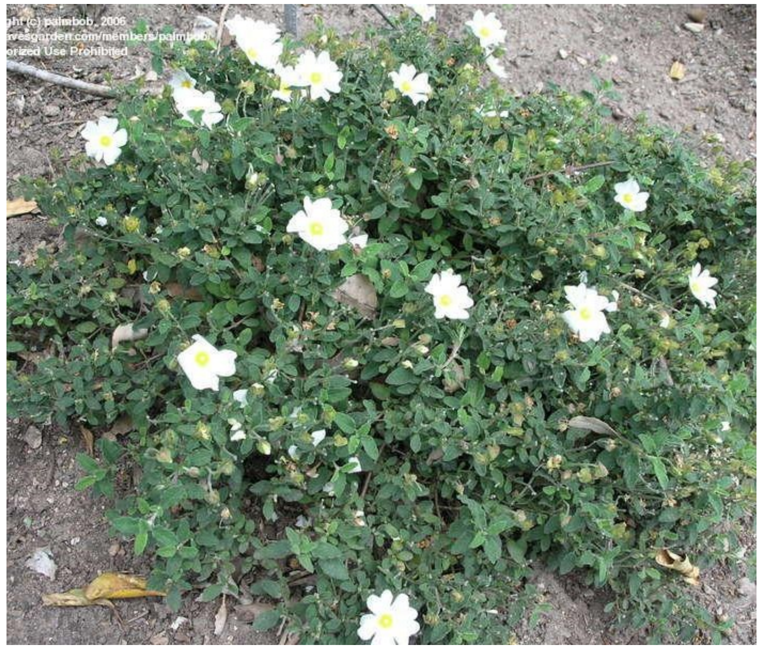
Low Fast Dammeria

Mexican Evening Primrose

Point Sal (CA Native)

Red Yucca

Rosemary



Sageleaf Rockrose

Santolina chamaecyparrissu
(Fairly Drought Tolerant)

# Drought Tolerant Shrub Palette


Sea Lavender (CA Native)


Sugar Bush (CA Native)
(Drought Tolerant when Established)


Toyon (CA Native)
(Drought Tolerant when Established)


Twin Peaks (CA Native)
(Fairly Drought Tolerant)


Verbena (CA Native)
(Fairly Drought Tolerant)


Verbena Peruviana


Woollyleaf Ceanothus (CA Native)


Yankee Point (CA Native)

# Drought Tolerant Tree Palette


African Sumac

Allepo Pine


Blue Elder Berry


Blue Palo Verde (CA Native)

California Bayberry (CA Native)

California Walnut (CA Native)


Coast Live Oak (CA Native)


Desert Willow (CA Native)

# Drought Tolerant Tree Palette

Mexican Palo Verde (CA Native)

Silk Tree

Strawberry Tree

Torrey Pine (CA Native)

Valley Oak (CA Native)

Western Cottonwood (CA Native)

Western Redbud (CA Native)

Western Sycamore (CA Native)
(Drought Tolerant when Established)