

**Appendix G:
Technical Studies Peer Review**

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Technical Studies Peer Review 440 Fair Drive Project City of Costa Mesa, Orange County, California

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Date: September 23, 2016

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SECTION 1: INTRODUCTION

1.1 - Introduction

This report compiles the peer review conducted by FirstCarbon Solutions of the technical studies prepared for the proposed 440 Fair Drive Project in the City of Costa Mesa.

Table 1 contains the comments pertaining to the following technical studies:

- June 3, 2016 Air Quality and Greenhouse Gas Emissions Impact Analysis Carnegie Avenue Residential Project, prepared by Vista Environmental
- September 10, 2015 Phase I Environmental Site Assessment, prepared by AEI Consultants
- September 1, 2016 Preliminary Hydrology Report TTM No. 18064, prepared by IDS Group
- June 26, 2016 Water Quality Management Plan TTM No. 18064, prepared by IDS Civil Engineers
- June 7, 2016 Noise Impact Analysis Carnegie Avenue Residential Project, prepared by Vista Environmental
- June 27, 2016 Traffic Impact Analysis Carnegie Avenue Homes, prepared by Infrastructure Group, Inc.

Table 2 contains new comments pertaining to the revised Hydrology Report and Water Quality Management Plan prepared by IDS Civil Engineers dated September 21, 2016.

Appendix A of this document contains the Hydrology Report with redlines. Appendix B of this document contains the Water Quality Management Plan with redlines.

Table 1: Technical Studies Comments

Comment No.	Section/Page No.	Comment	Response	Adequate Response?
June 3, 2016 Air Quality and Greenhouse Gas Emissions Impact Analysis Carnegie Avenue Residential Project, prepared by Vista Environmental				
1	Page 1	Section 1.4, SCAQMD Rules: Mention should be made that the project must comply with SCAQMD Rule 1403 that deals with asbestos removal.	A summary of Rule 1403 was added to page 3 of the Air Report.	No, AQ edits still contain errors that need to be corrected. While a summary of Rule 1403 was added, the text on this summary incorrectly references Rule 1143 and not Rule 1403. This needs to be revised.
2	Page 44	Operations-Related TAC Impacts: The report refers to the recent Supreme Court decision on <i>California Building Industry Association vs. BAAQMD</i> , which basically states that CEQA does not provide a “general requirement that an agency analyze existing environmental conditions whenever they pose a risk to the future residents or users of a project. The State has adopted specific statutes that provide an exemption to this rule such as for schools and homes near airports, however as to date there are no exemptions to this rule for TAC emission sources.” The report mentions that the project would be located adjacent to an existing gasoline service station that represents a source of TAC emissions from the operation of the service station. Despite the Court decision, the SCAQMD in its role as a commenting agency continues to provide comments regarding the siting of sensitive receptors near existing sources of TAC emissions—in this case, the gasoline service station and its potential health risks on the future residents of the project. The City will have to respond to this comment, if asked by the SCAQMD as to why a health risk assessment was not performed to quantify the potential health risks from the gas service station on the project’s future residents.	The analysis on page 44 was revised to include an analysis of the gas station TAC cancer risks to the proposed homes.	Yes

Table 1 (cont.): Technical Studies Comments

Comment No.	Section/Page No.	Comment	Response	Adequate Response?
September 10, 2015 Phase I Environmental Site Assessment, prepared by AEI Consultants				
1	Pages 16–17	Concerning the leaking underground storage tank (LUST) site associated with the adjoining active gasoline station property at 2502 Harbor Boulevard—although the regulatory case is listed as Case Closed by the local oversight agency, FCS believes it would have been prudent for the Phase I to discuss the location and distance of underground storage tanks and groundwater monitoring wells at this site in relation to the Subject Property’s property line. In addition, the location and distance of the car wash clarifier associated with 2502 Harbor Boulevard should also have been mentioned. This critique does not represent a recognized environmental condition for the Subject Property.	<ul style="list-style-type: none"> • The USTs are located approximately 80 to 90 feet from the subject property boundary • The clarifier appears to be located approximately 10 to 15 feet from the subject property boundary • The distance to the closest groundwater monitoring well was indeed discussed in the report: <p>“According to groundwater samples collected in the immediate vicinity of the subject property (MW-12; located approximately 5-30 feet to the west of the subject property building.”</p>	Yes
2	Page 26	Concerning the oily sheen observed inside the pan below the elevator equipment in the small elevator equipment room—although the service log was affixed to the equipment and AEI reported no staining observed on the concrete floor next to the equipment, FCS believes it would have been prudent for the elevator equipment servicer, Elevator Superior Alliance, to be contacted to discuss on-site elevator operations, including finding out whether or not the elevator equipment oils contain PCBs.	Noted. However, no evidence of staining or a release was noted.	Yes
3	Page 26	Concerning the on-site auto rental/sales company—“AA Auto rental And Sales uses two metal containers located immediately to the north of the building to conduct its business. [Property representative] Mr. D’Alessio indicated that the company has performed occasional light repair of vehicles in the parking area in the vicinity of these containers.” FCS believes it would have been prudent for the Phase I to provide further details regarding the nature of light repairs conducted at the Subject Property.	<p>Noted. However, no features of concern were noted and operations appeared to be small-scale. No significant quantities of hazardous materials were observed.</p> <p>Based on the small size, lack of any observed conduits to the subsurface and lack of any significant staining, these features are not expected to represent a significant environmental concern. Additionally, this use is no longer on site.</p>	Yes

Table 1 (cont.): Technical Studies Comments

Comment No.	Section/Page No.	Comment	Response	Adequate Response?
4	—	Concerning the Appendices—the “Approximate Property Boundary” on Figures 2, 3, and the Historical Aerial Photos appears to accurately depict the Subject Property’s boundaries; however, the approximate property boundary found on Figure 1 does not match Figures 2, 3, or the Historical Aerial Photos. In addition, the approximate property boundary within the ERIS Database Report does not include the entire Subject Property parking lot area to the east and north-northeast of the on-site buildings; therefore, distances for ERIS Database Report findings located to the north and east of the Subject Property may be less accurate than actual distances. In addition, the approximate property boundary shown on the historical topographic maps appears to include the gasoline service station/car wash property located directly adjacent to Harbor Boulevard.	Figure 1 has been updated Topographic maps have been updated. ERIS report distances were double checked manually by AEI. The property boundary was entirely eliminated from the figures provided. Add the correct property boundary to the set.	Yes
September 1, 2016 Preliminary Hydrology Report TTM No. 18064, prepared by IDS Group				
1	—	In general: Please use the Orange County Hydrology Manual (also addendum 1) for the following: a. Hydrologic Protect Levels (10-year, 25-year, and 100-year storm events, as noted in section A2. b. Precipitations c. For initial area, maximum distance is limited to 100 meters (330 feet) d. Refer to Orange County Hydrology Workbook for sample calculations. Website: http://ocflood.com/docs/manuals http://ocflood.com/civicax/filebank/blobdload.aspx?BlobID=8338 .	a) now provided b) we did this correctly by using the intensity formulas published in the manual. c) per our phone conference it was determined to leave this as is since it’s not significant d) our calcs do conform	See Table 2
2	—	Existing Condition Hydrology Map: Please verify if entire building and site drains towards Carnegie Avenue. It appears that portions of the roof and site along Fair Drive drain to Fair Drive.	roof drainage predominantly flows to parking lot	See Table 2
3	—	Proposed Condition Hydrology Map: a. Cross Lot Drainage. Is there an easement for the proposed 8-inch storm drain that picks up area drains in the back yard? Lots (Condo unit yards) should drain toward the front of the lot into common driveway. b. How will stormwater enter the underground (U.G.) Chamber System for different storm events (85 th percentile or first flush, 10-yr, 25-yr, and 100-	a) it’s a one lot subdivision & everything on the outside to be HOA maintained and is addressed in the summary of the report, b) see the conceptual grading & drainage plan. typically not shown on hydrology maps.	See Table 2

Table 1 (cont.): Technical Studies Comments

Comment No.	Section/Page No.	Comment	Response	Adequate Response?
		yr storm events)? Is there a diversion structure that only the 85 th percentile or first flush storm enters the U.G. storm chamber? c. Demonstrate that the proposed drainage system meets the required hydrologic Protect Levels (10 yr, 25 yr, and 100 yr storm events per section A2). d. Demonstrate secondary overflow from the U.G. Chamber System.	c) not in a 100 year flood one and pads are elevated 1' above curb this is now in the summary. d) see conceptual grading and drainage plan – the secondary overflow is via surface flow to carniege	
4	—	See redline comments throughout Appendix A of this document.		
June 26, 2016 Water Quality Management Plan TTM No. 18064, prepared by IDS Civil Engineers				
1	Page 7	Section II.3 Hydrologic Conditions of Concern: Please follow Technical Guidance Document (TGD) Section IV to determine flow rates for 2-year, 24-hour storm event pre- and post- development condition to address hydrologic conditions of concern (HCOC). (Note: 85 th percent 24-hour storm event is not the same as 2-year, 24-hour storm event.)	not applicable – we do not have to address HCOC since post development runoff is less than pre runoff conditions.	See Table 2
2	Page 12	Section III.3 Watershed Description: a. Please follow the Orange County Water Quality Management Plan (WQMP) Manual and the latest 303(d) Listed Impairments (Toxicity and Other Organics are listed on the table). b. Please follow Orange County WQMP manual and Water Board summary of statutes of TMDLs for Water bodies in Regions 8 and 9 (Metals and Pesticides are listed on the table).	a) 303 (d) table is not provide in the preliminary WQMP b) applicable TMDLs are listed in the report.	See Table 2
3	—	Preliminary WQMP Site Plan—Please provide the following: a. North arrow with scale. b. Identify and label Catch Basin Inserts location on the site plan. c. Provide details of the CMP Infiltration Chamber (how stormwater enter the system, overflow, diversion if only accepting Vbmp, Impermeable Membrane and set back from building structure according to the soils report, etc.) d. Show flow arrows.	a) now provided b) added to the exhibit c) details for the BMP typically not shown on this exhibit – we reference it on the conceptual grading plan. final details for these times will be provided on final plans. d) done	See Table 2

Table 1 (cont.): Technical Studies Comments

Comment No.	Section/Page No.	Comment	Response	Adequate Response?
4	Attachment B	303(d) List: Please use the latest 303(d) list (2010) from the California State Water Board Website.	provided	See Table 2
5	Attachment C	Please follow Orange County TGD’s appendix IV for supporting calculations. Note: 2-year 24-hour storm event precipitation is not the same as 85 th percentile rainfall depth.	acknowledged –this was a typo in the report that was corrected – calcs remain the same	See Table 2
6	Attachment E	Complete step 3 of the worksheet, since infiltration U.G. Chamber System is proposed. Provide draw-down calculation based on percolation rate determined by the soils report (7 inches/hour with appropriate factor of safety, consistent with the Orange County WQMP Manual).	draw down calcs no provided	See Table 2
7	—	Please include Tentative Tract Map No. 18064 drawings in the report for reference use.		See Table 2
8		See redline comments throughout Appendix B of this document.		
June 7, 2016 Noise Impact Analysis Carnegie Avenue Residential Project, prepared by Vista Environmental				
1	—	The implementation of the soundwall, as described in Mitigation Measure 1 would not sufficiently reduce traffic noise levels as assumed in the analysis. For a soundwall to provide effective protection from a noise source, the sound path must be blocked from the source to the receptor. The description of the location of the soundwall in Mitigation Measure 1 would not fully achieve this. The backyard area for Unit 9 adjacent to the entrance to the project site from Fair Drive, and the backyard area for Unit 8 at the corner of Fair Drive and Carnegie Avenue would need the wall to wrap around their east sides to provide shielding that would effectively block the sound path for traffic traveling along Fair Drive. Therefore, Mitigation Measure 1 should be modified to include the following: “In addition, this soundwall should wrap round the east side of the backyard area of Unit 9, and either connect to the façade of this unit or extend a minimum of 5 feet north of the southeast corner of this unit. To adequately protect the backyard area of Unit 8, this soundwall should either connect to the southeast corner of the façade of this unit or extend a minimum of 10 feet west of the southeast corner of this unit. For the Unit 8 lot, the soundwall should also wrap around the east side of the	Mitigation Measure 1 was revised to detail that the sound wall shall wrap around the east side of the backyard for Unit 9. For Unit 8 the text was revised to detail that the sound wall should run from the façade to the southeast corner of the backyard. It should be noted that for design reasons, the southeast corner of Unit 8 will be exposed to the road and not be a part of the Unit’s backyard. The City only requires that private backyard areas to meet the 65 dBA CNEL exterior noise standard, so the wall was placed adjacent to the edge of the backyard. In order to provide clarification of wall placement, Figure 3 was added to the noise report.	Yes

Table 1 (cont.): Technical Studies Comments

Comment No.	Section/Page No.	Comment	Response	Adequate Response?
		backyard area, along the property line bordering Carnegie Avenue, and extend a minimum of 5 feet north of the northeast corner of the backyard area of this unit.”		
2	—	For a soundwall to provide effective protection from a noise source, the sound path must be blocked from the source to the receptor. Thus, the soundwall along the backyard of Unit 13 must connect with the soundwall proposed in Mitigation Measure 3. Therefore, Mitigation Measure 3 should be modified to include the following: “This soundwall should connect to the soundwall described in Mitigation Measure 1, with no openings or gaps permitted along Fair Drive.”	The requested text was added to Mitigation Measure 3. In order to provide clarification of wall placement, Figure 3 was added to the noise report.	Yes
3	Page 17	The site description for Site A, in Table D, should include the word “east” after “200 feet.”	The requested text was added to Table D.	Yes
June 27, 2016 Traffic Impact Analysis Carnegie Avenue Homes, prepared by Infrastructure Group, Inc.				
1	Table of Contents	List of Exhibits: The figure titles shown in the List of Exhibits are inconsistent with titles shown on the actual figures.	Noted, fixed	Yes
2	Page 2 & 3	Figure 1 and Figure 2: These figures are switched, based on the descriptions provided on page 1.	Noted, fixed	Yes
3	Page 4	Existing Traffic Volumes: This section should clarify that local schools, specifically Orange Coast College, were in session at the time the traffic counts were collected. Traffic count worksheets for the Average Daily Traffic (ADT) volumes shown on Figure 4 should be included in Appendix A, or another source should be referenced in this paragraph.	Noted, fixed	Source of ADTs not identified. However, ADT volumes are not required to be shown and have no relevance to the evaluation of project traffic impacts. Therefore, no further action is required.

Table 1 (cont.): Technical Studies Comments

Comment No.	Section/Page No.	Comment	Response	Adequate Response?
4	Page 5	Figure 3: The Carnegie Avenue/Fair Drive southbound approach is missing the stop sign traffic control, and the southbound right-turn lane should be denoted as a <i>de facto</i> turn lane.	Noted, fixed	Yes
5	Page 6	Figure 4: The AM/PM peak-hour volumes for the northbound right-turn movement at the intersection of Carnegie Avenue/Fair Drive are switched.	Noted, fixed	Yes
6	Page 8	Table C: The ICU column heading should remove “/LOS” since the LOS is shown in a separate column.	Noted, fixed	Yes
7	Page 9	Table D: The table should show the ITE trip generation rates used to determine the proposed project trips generated and should identify the corresponding land use code(s). Based on the proposed 28 dwelling units, it does not appear that trip generation rates for the applicable condominium/townhome land use (ITE 230) were used. Additionally, “counts” is misspelled in the second footnote.	ITE trip gen 230 was utilized, an expanded discussion was added to the text	Yes
8	Page 12	Figure 6: It does not appear that existing site trips are based on the same project trip distribution percentages shown on Figure 5. The report should clarify how the existing site trip assignment was determined.	Noted, fixed	Yes
9	Page 16	Figure 9: The AM/PM peak-hour volumes for the northbound right-turn movement at the intersection of Carnegie Avenue/Fair Drive are switched.	Noted, fixed	Yes
10	Appendix B	The Level of Service worksheets for Harbor Boulevard/Fair Drive show only two northbound through lanes instead of three. The Level of Service worksheets for Carnegie Avenue/Fair Drive do not include the southbound <i>de facto</i> right-turn lane as shown on Figure 3.	Noted, fixed	Yes

Table 2: New Technical Studies Comments

Comment No.	Section/Page No.	Comment
September 21, 2016 Preliminary Hydrology Report and Water Quality Management Plan TTM. 18064 prepared by IDS Group		
1	—	Proposed condition drainage concept shall be confirmed with City Engineer prior to the preparation of final plans and reports.
2	—	They have provided some discussion on flood protection and protection to downstream properties. Further details shall be provided in final plans and reports.
3	—	Reports are acceptable to support conceptual design and IS preparation.

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**Appendix A:
Preliminary Hydrology Report**

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16C004.00 Costa Mesa Subdivision
Tentative Tract 18064
Preliminary Hydrology



Preliminary Hydrology Report

TENTATIVE TRACT MAP NO. 18064

Project Name:

COSTA MESA RESIDENTIAL DEVELOPMENT

440 Fair Drive, Costa Mesa, CA

Prepared for:



Prepared By:



Integrated Design Services

1 Peters Canyon Road, Ste. 130

Irvine, Ca 92606

Phone: 949- 387-8500

Prepared on:

September 1, 2016

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Attachments

APPENDIX A: FEMA MAP

APPENDIX B: SOIL INDEX MAP

APPENDIX C: TIME OF CONCENTRATION NOMOGRAPH

APPENDIX D: RATIONAL METHOD STUDY FORM

APPENDIX E: HYDROLOGY MAP

I. INTRODUCTION

PURPOSE

The purpose of this hydrology report is to evaluate the impact of the 2-year, 5-year and 10-year storm runoff flow from the watershed tributary to the boundaries of the proposed project site. This study also evaluates the pre & post-development hydrological conditions of the site and helps in implementing development mitigation requirements and providing storm drain systems for flood protection of the proposed structures.

PROJECT LOCATION

The site is located at 440 Fair Drive within the city of Costa Mesa, California. The property is bordered by Automotive Facilities to the north and northwest, a gas station to the southwest, Fair Drive to the south, and Carnegie Avenue to the east. The site in relation to the surrounding area is shown on Vicinity Map.

EXISTING CONDITION

The site is currently developed with a two-story commercial building (mini-mall) and a large, asphalt paved parking lot. Associated improvements include some concrete flatwork, underground utilities and a masonry block screen wall along the east margin of the site. Chain-link fencing also bounds the property on the north and west property lines.

Vegetation on site consists of some mature trees along the east property line with some small landscape islands and planters around the building area. Based on Google Earth, topography on site is relatively level at approximately 70 feet above mean sea level. Drainage is generally directed as sheet flow to the north east towards Carnegie.

The site is relatively flat and the elevation of the site ranges from about 73 feet above mean sea level (MSL) within the southern portion of the site to about 70 feet above MSL in the northern portion of the site.

Please provide 10, 25, and 100 year storm events rational method analysis. Refer to Section A.2. of Orange County Hydrology Manual.

DRAINAGE AREA	AREA (ACRE)	2 YEAR	5 YEAR	10 YEAR
		(CFS)	(CFS)	(CFS)
Existing Area	1.67	2.10	3.0	3.79

FLOODING HARZARDS

Based on the Flood Insurance Rate Map prepared by The Federal Emergency Management Agency (FEMA), the site is not located within a flood hazard zone for the 500 Year Flood events. See attached map in Appendix A.

PROPOSED DEVELOPMENT

The proposed site is located at 440 Fair Drive within the city of Costa Mesa, California. The proposed site consists of 8 two-story detached homes and 20 three-story duplex units with a total of 28 homes. The site includes interior driveways, decorative hardscape, parking areas, perimeter walls, fences, underground utilities and a shallow infiltration system (CMP detention System). Refer to "Post-Development Hydrology Map" in Appendix F for a graphical presentation of this information. The storm water runoff generated from the proposed site will be treated to minimize the storm water pollution prior to discharging into the street. A Water Quality Management Plan (WQMP) Report is prepared for this project to implement the best management practices.

The pre and post drainage patterns will remain the same, except the site will have BMP system that will treat and retain the stormwater runoff and infiltrate the runoff with CMP detention System. All the Units front area and the Private Street sheet flows to gutter. The flow collected in the gutter is intercepted by a catch basin located at the entrance of the site. The landscape areas runoff will be collected by area drains. An 8" pipe will then carry the flow from the area drain (located at various location) to the catch basin. The catchbasin includes the triton filters (TR filters) that act as primary treatment. TR Filter is a multipurpose catch basin insert designed to capture sediment, trash, debris, suspended solids, oils & grease and other storm water pollutants. A 12" pipe will then carry the flow from the catchbasin to 96" stormdrain detention system that will retain and infiltrate the 100% Design Captured Volume runoff. The 85th percentile 24-hr storm event runoff volume will be fully captured and infiltrated by the above system. For Q₁₀ 24-hr storm event, the runoff will sheet flows easterly to the Carnegie Avenue.

There are no existing storm drain systems near property and therefore, the runoff will be collected at the nearest (intersection of Princeton Dr. and Carnegie Ave) catch basin. From there, runoff will be carried out by an existing storm drain system to Paularino Channel to Santa Ana Delhi Channel that eventually will carry out the discharge to the Newport Bay.

Please provide 10, 25, and 100 year storm events rational method analysis. Refer to Section A.2. of Orange County Hydrology Manual.

DRAINAGE AREA	AREA (ACRE)	2 YEAR	5 YEAR	10 YEAR
		(CFS)	(CFS)	(CFS)
Proposed area	1.67	1.91	2.74	3.40

Please use Orange County Hydrology Manual for the following:
 1. Hydrologic Protect Levels
 2. Precipitations
 3. For Initial area, maximum distance is limited to 100m (330').

METHODOLOGY

The County of Orange Hydrology Manual, Rational Method was used to determine the flow rate for the 2-year, 5-year and 10-year storm event. Information pertinent to Soil Type (Appendix B) as published in the manual were used. The nomograph (Appendix C) published in the manual was used to compute time of concentration for each of the subareas in accordance with the Hydrology Manual. The Tc of longest path of travel was used to determine each overall area flowrate. The non-mountainous formulas were used to develop the intensities for this study. The maximum loss rate (Fm) due to infiltration which is a function of the soil type and impervious fraction were computed for each subarea using the watershed data and the formulas from the Hydrology Manual. See Appendix D for calculations. In the proposed condition, the project site consists of overall site drainage areas which are shown in the attached "Post-development Hydrology Map" and can be described as follows:

1. Area I consists of Units 1 though 28, Private Street, parking lots.

RESULTS

Based on the NRCS Hydrologic Soil Groups Figure XVI-2a, the soil type was determined to be in Group D.

The calculated flow rate at:

DRAINAGE AREA	AREA (ACRE)	2 YEAR	5 YEAR	10 YEAR
		(CFS)	(CFS)	(CFS)
Existing Area	1.67	2.10	3.0	3.79
Proposed area	1.67	1.91	2.74	3.40

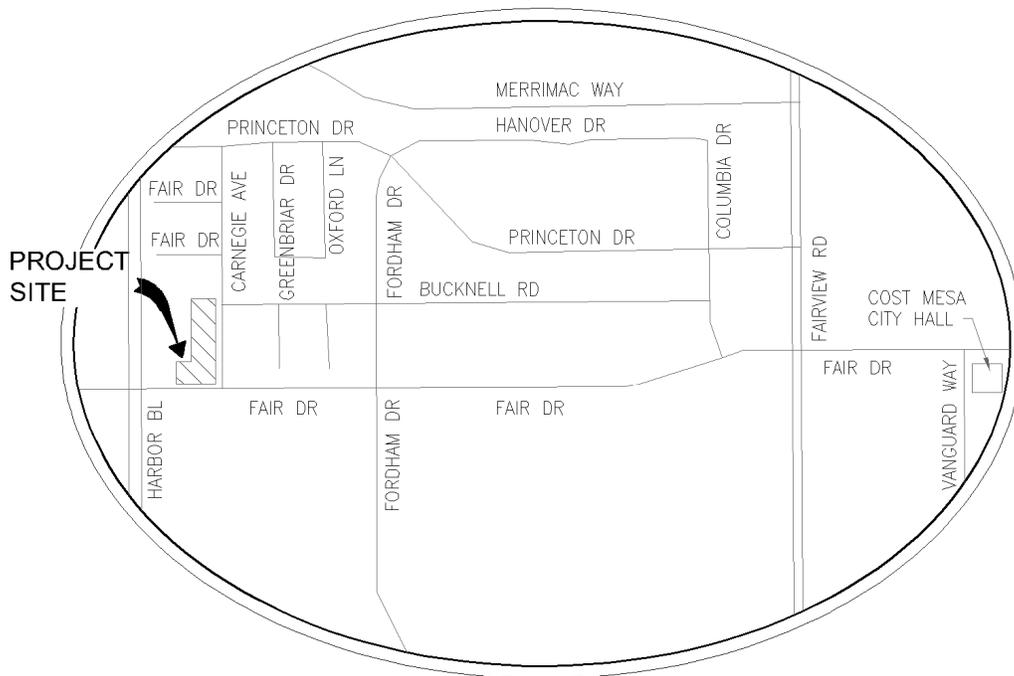
Please provide 10, 25, and 100 year storm events rational method analysis. Refer to Section A.2. of Orange County Hydrology Manual.

CONCLUSION

The proposed development will slightly decrease the runoff from the site for the 2-yr, 5-yr and 10-yr 24-hr storm event due to longer time of concentration and increase in pervious area. The existing site consists of commercial building and parking structure while the proposed site includes residential single family homes and townhome and therefore impervious cover value decreases and the time of concentration increases for the proposed site.

The proposed condition will not increase the peak discharge (runoff) due to increase in pervious area for new development and therefore mitigation of peak runoff is not require for this project.

II. VICINITY MAP



VICINITY MAP 
NTS

APPENDIX A: FEMA MAP

NOTES TO USERS

This map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. The community map repository should be consulted for possible updates or additional flood hazard information.

To obtain more detailed information in areas where Base Flood Elevations (BFEs) and/or Floodways have been determined, users are encouraged to consult the Flood Profiles and Floodway Data and/or Summary of Stillwater Elevations files contained within the Flood Insurance Study (FIS) report that accompanies this FIRM. Users should be aware that BFEs shown on the FIRM represent rounded whole-foot elevations. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation data presented in the FIS report should be utilized in conjunction with the FIRM for purposes of construction and/or floodplain management.

Coastal Base Flood Elevations shown on this map apply only to landward of 0.0 North American Vertical Datum of 1988 (NAVD 88). Users of this FIRM should be aware that coastal flood elevations are also provided in the Summary of Stillwater Elevations tables in the Flood Insurance Study report for this jurisdiction. Elevations shown in the Summary of Stillwater Elevations tables should be used for construction and/or floodplain management purposes when they are higher than the elevations shown on this FIRM.

Boundaries of the floodways were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway width and other pertinent floodway data are provided in the Flood Insurance Study report for this jurisdiction.

Certain areas not in Special Flood Hazard Areas may be protected by flood control structures. Refer to Section 4 "Flood Protection Measures" of the Flood Insurance Study report for information on flood control structures for this jurisdiction.

The projection used in the preparation of this map was Universal Transverse Mercator (UTM) Zone 11. The horizontal datum was NAD 83. GRS80 spheroid. Distortions, if any, are negligible. Projections of UTM areas used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of this FIRM.

Flood elevations on this map are referenced to the North American Vertical Datum of 1988. These flood elevations must be compared to structure and ground elevations referenced to the same vertical datum. For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at <http://www.ngs.noaa.gov> or contact the National Geodetic Survey at the following address:

NCS Information Services
NOAA NINE312
National Geodetic Survey
SPAC-3 #9020
1315 East-West Highway
Silver Spring, Maryland 20910-3282
(301) 713-3242

To obtain current elevation, description, and/or location information for bench marks shown on this map, please contact the Information Services Branch of the National Geodetic Survey at (301) 713-3242, or visit its website at <http://www.ngs.noaa.gov>.

Base map information shown on this map was derived from the National Agriculture Imagery Program, dated 2005.

This map reflects more detailed and up-to-date stream channel configurations than those shown on the previous FIRM for this jurisdiction. The floodplains and floodways that were transferred from the previous FIRM may have been adjusted to conform to these new stream channel configurations. As a result, the Flood Profiles and Floodway Data tables in the Flood Insurance Study Report (which contains authoritative hydraulic data) may reflect stream channel distances that differ from what is shown on this map.

Corporate limits shown on this map are based on the best data available at the time of publication. Because changes due to annexations or de-annexations may have occurred after this map was published, map users should contact appropriate community officials to verify current corporate limit locations.

Please refer to the separately printed Map Index for an overview map of the county showing the layout of map panels, community map repository addresses, and a Listing of Communities table containing National Flood Insurance Program data for each community as well as a listing of the panels on which each community is located.

Contact the FEMA Map Service Center at 1-800-358-9616 for information on available products associated with this FIRM. Available products may include previously issued Letters of Map Change, a Flood Insurance Study report, and/or digital versions of the map. The FEMA Map Service Center may also be reached by Fax at 1-800-358-9620 and its website at <http://www.fema.gov>.

If you have questions about this map or questions concerning the National Flood Insurance Program in general, please call 1-877-FEMA-MAP (1-877-336-2627) or visit the FEMA website at <http://www.fema.gov>.

Accreted Levee Notes to Users: Check with your local community to obtain more information, such as the estimated level of protection provided which may exceed the 1-percent-annual-chance levee and Emergency Action Plan, on the levee system(s) shown as providing protection for areas on this panel. To mitigate flood risk in residual areas, property owners and residents are encouraged to consider flood insurance and floodproofing or other protective measures. For more information on flood insurance, interested parties should visit the FEMA Website at <http://www.fema.gov/business/fip/index.htm>.

Accreted Levee Notes to Users: Check with your local community to obtain more information, such as the estimated level of protection provided which may exceed the 1-percent-annual-chance levee and Emergency Action Plan, on the levee system(s) shown as providing protection for areas on this panel. To mitigate flood risk in residual areas, property owners and residents are encouraged to consider flood insurance and floodproofing or other protective measures. For more information on flood insurance, interested parties should visit the FEMA Website at <http://www.fema.gov/business/fip/index.htm>.

Accreted Levee Notes to Users: Check with your local community to obtain more information, such as the estimated level of protection provided which may exceed the 1-percent-annual-chance levee and Emergency Action Plan, on the levee system(s) shown as providing protection for areas on this panel. To mitigate flood risk in residual areas, property owners and residents are encouraged to consider flood insurance and floodproofing or other protective measures. For more information on flood insurance, interested parties should visit the FEMA Website at <http://www.fema.gov/business/fip/index.htm>.

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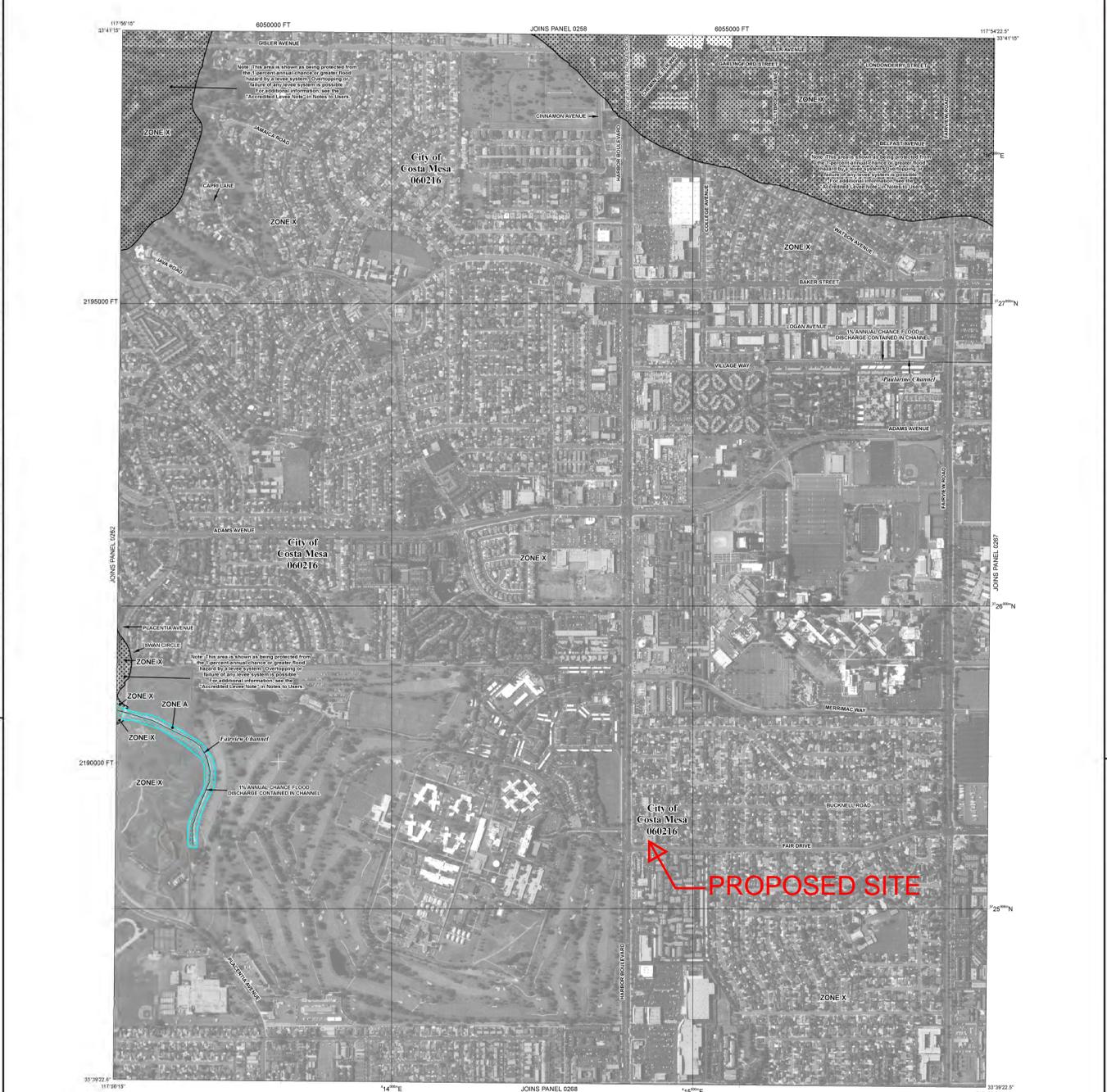
Accreted Levee Notes to Users: Check with your local community to obtain more information, such as the estimated level of protection provided which may exceed the 1-percent-annual-chance levee and Emergency Action Plan, on the levee system(s) shown as providing protection for areas on this panel. To mitigate flood risk in residual areas, property owners and residents are encouraged to consider flood insurance and floodproofing or other protective measures. For more information on flood insurance, interested parties should visit the FEMA Website at <http://www.fema.gov/business/fip/index.htm>.

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LEGEND

SPECIAL FLOOD HAZARD AREAS SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual flood (10-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zone A, AE, AH, AO, AV, and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

ZONE A
no Base Flood Elevations determined;
Base Flood Elevation determined.

ZONE AH
Flood depths of 4 to 3 feet (usually areas of ponds); Base Flood Elevation determined.

ZONE AO
Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined; For areas of shallow fan flooding, depths also determined.

ZONE AR
Special Flood Hazard Area formerly protected from the 1% annual chance flood by a flood control system that was subsequently determined. Zone AR indicates that the former flood control system is being retained to provide protection from the 1% annual chance or greater flood.

ZONE AV
Area to be protected from 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined.

ZONE VE
Coastal flood zone with velocity hazard (wave action); no Base Flood Elevation determined.

Coastal Flood Area with velocity hazard (wave action); Base Flood Elevation determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be left free of encroachment to that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

ZONE X
Area of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with discharge areas less than 1 square mile, and areas protected by levees from 1% annual chance flood.

OTHER AREAS

ZONE D
Areas determined to be outside the 0.2% annual chance floodplain.

ZONE B
Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

CBRS areas and CBRS are normally located within or adjacent to Special Flood Hazard Areas.

OTHERWISE PROTECTED AREAS (OPAs)

1% annual chance floodplain boundary

0.2% annual chance floodplain boundary

Floodway boundary

Zone D boundary

CBRS and OPA boundary

Boundary showing Special Flood Hazard Area and boundary dividing Special Flood Hazard Areas of different Base Flood Elevation; flood depth or flood velocity

Base Flood Elevation line and value, elevation in feet

Base Flood Elevation value where Uniform water zone, elevation in feet

(E.L. 987)

Referenced to the North American Vertical Datum of 1988

Cross section line

Transect line

Geographic coordinates referenced to the North American Datum of 1983 (NAD 83), Western Hemisphere

1000-meter Universal Transverse Mercator grid values, zone 11C, NAD 83 UTM Zone 11C

2000-foot grid lines, California State Plane coordinate system, zone VI (PPSC92 projection), unshifted Conformal Conic projection

Bench mark (see explanation in Notes to Users section of this FIRM)

1:1 Scale

MAP REPOSITORY

Refer to listing of Map Repositories on this map index

STRUCTURE DATE OF COUNTY/FLOOD INSURANCE RATE MAP

September 16, 1998

EFFECTIVE DATES OF REVISIONS TO THIS PANEL

February 1, 1992 - November 3, 1993 - January 3, 1997 - February 18, 2004 - December 3, 2009

In distribution of revisions, see Notes to Users page in the Flood Insurance Study report.

For community map revision history prior to countywide mappings, refer to the Community Map history table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

MAP SCALE 1" = 600'

0 500 1000 FEET

0 150 300 METERS

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0266J

FIRM

FLOOD INSURANCE RATE MAP

ORANGE COUNTY, CALIFORNIA AND INCORPORATED AREAS

PANEL 266 OF 539

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS	NUMBER	PANEL	SUFFIX
COMMUNITY	060216	0266	J
COUNTY	060216	0266	J

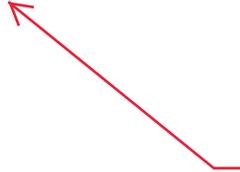
Historic User: The Map Number shown below should be used when obtaining map sections. The Community Number shown above should be used on insurance applications for the subject community.

MAP NUMBER 0505C0266J

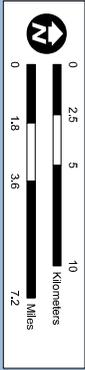
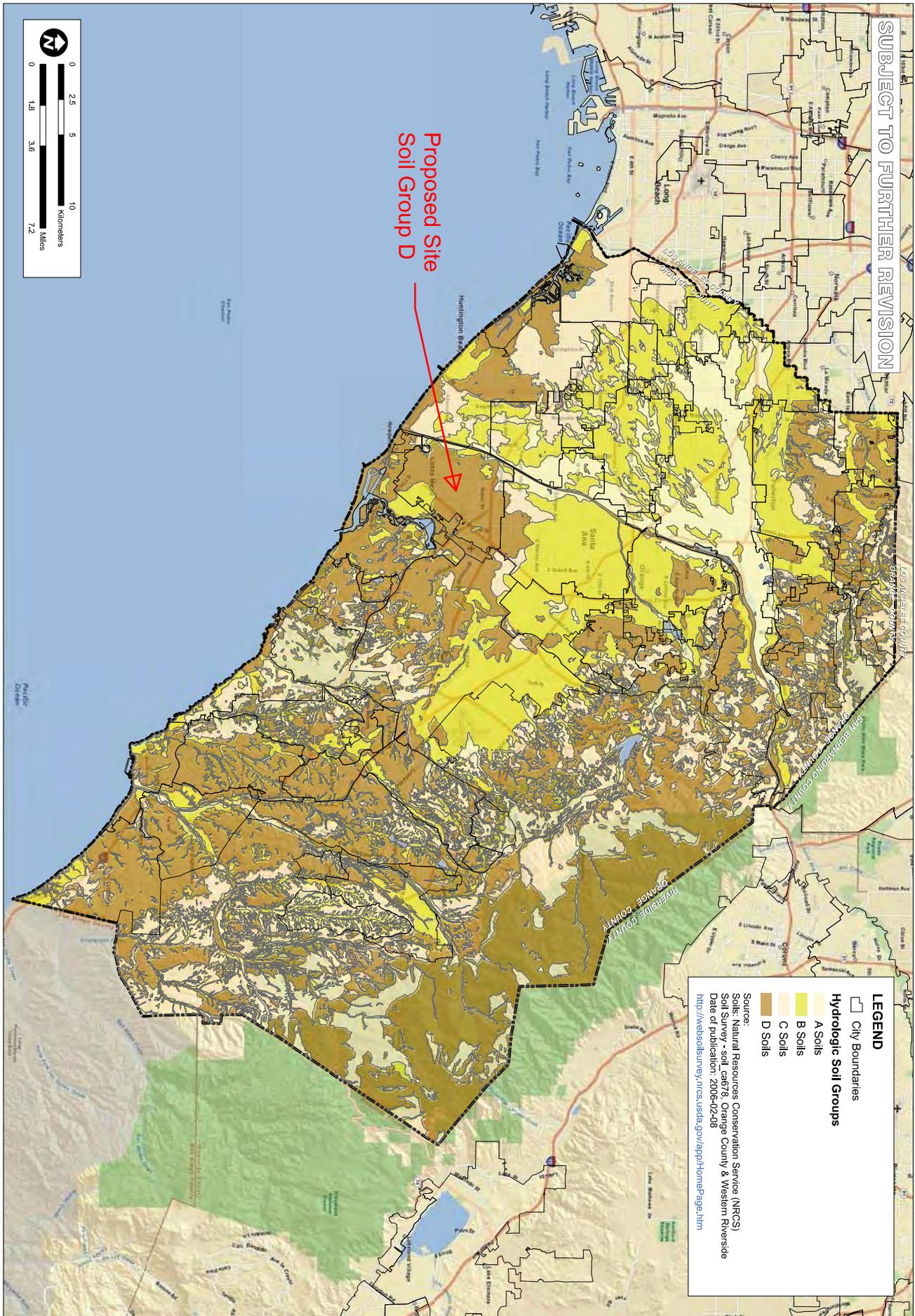
MAP REVISED DECEMBER 3, 2009

Federal Emergency Management Agency

APPENDIX B: SOIL INDEX MAP



Below map is from OC WQMP manual.
Preferably to use soil index map per Orange
County Hydrology Manual. Website:
<http://ocflood.com/docs/manuals>
Or the U.S. Department of
Natural Resource Conservation Service website.



SUBJECT TO FURTHER REVISION

Proposed Site
Soil Group D

LEGEND

- City Boundaries
- Hydrologic Soil Groups**
- A Soils
- B Soils
- C Soils
- D Soils

Source:
Soils: Natural Resources Conservation Service (NRCS)
Soil Survey - soil_caf78_Orange County & Western Riverside
Date of publication: 2006-02-08
<http://websoilsurvey.nrcs.usda.gov/app/HomePage.htm>

XVI-2a
FIGURE



SCALE	1" = 1.8 miles
DESIGNED	TH
DRAWING	TH
CHECKED	BMP
DATE	02/09/11
JOB NO.	9526-E

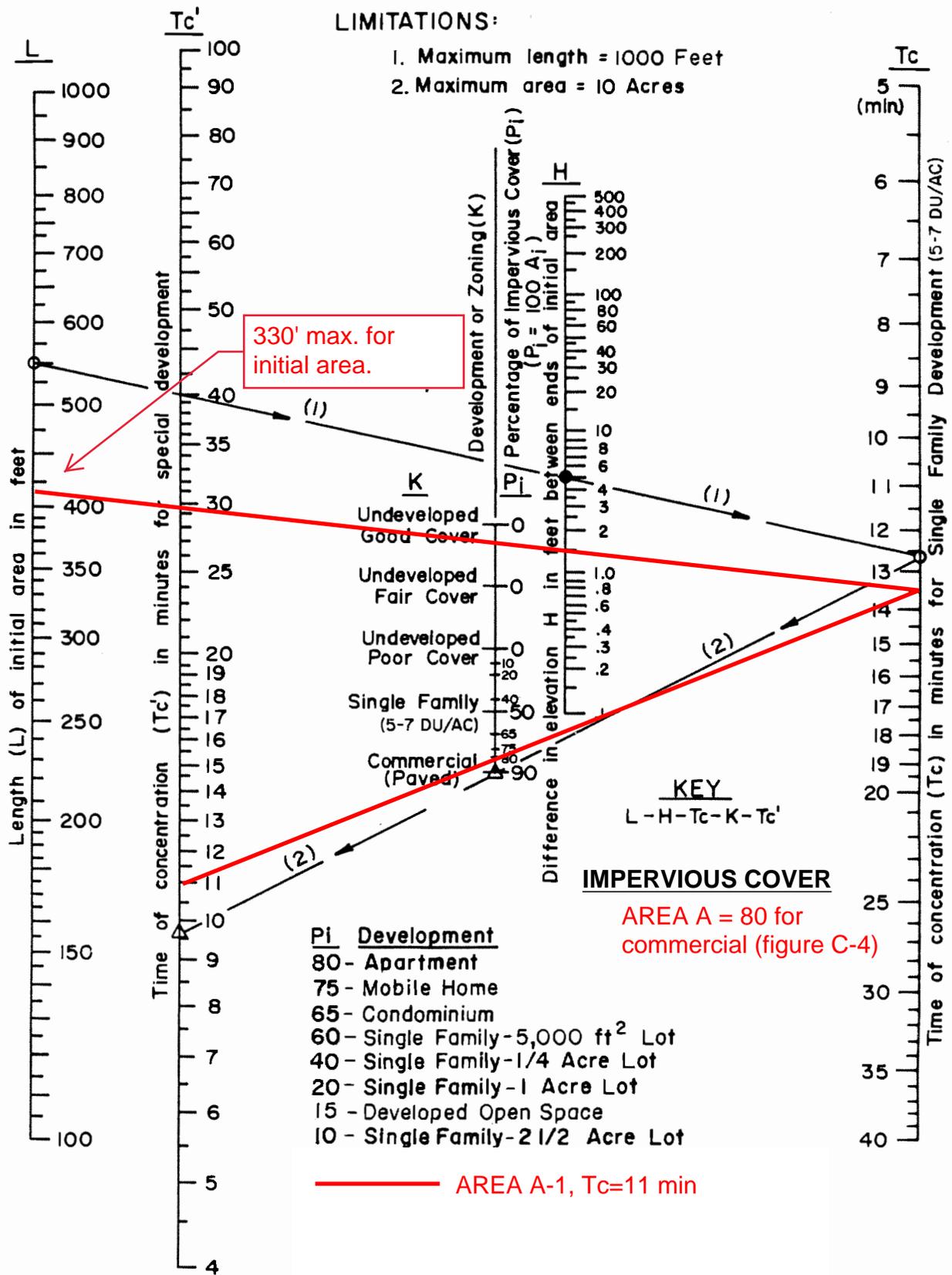
**ORANGE COUNTY
INFILTRATION STUDY**

ORANGE CO. CA

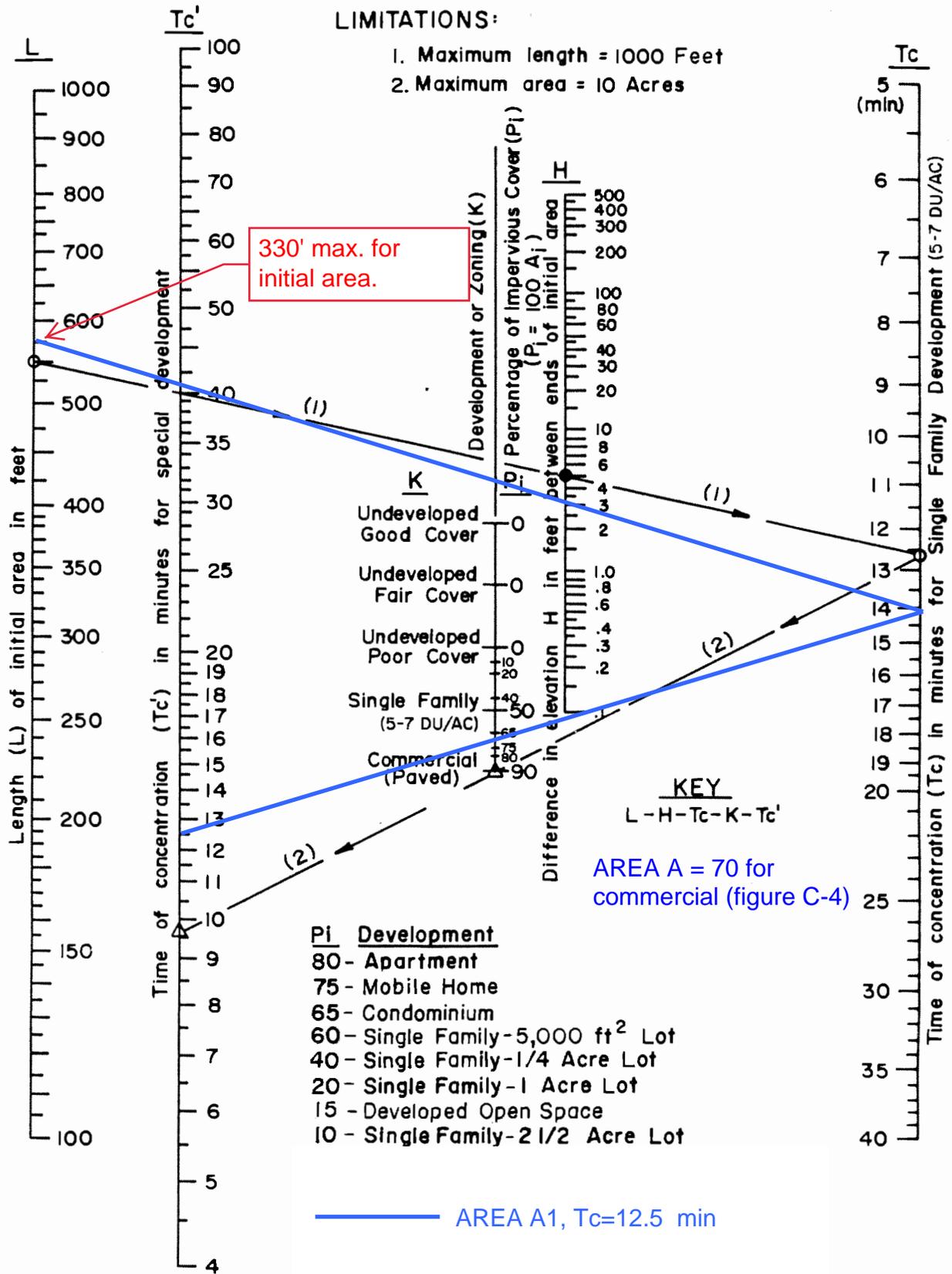
**NRCS HYDROLOGIC
SOILS GROUPS**

APPENDIX C: TIME OF CONCENTRATION NOMOGRAPH

PRE-DEVELOPMENT (CM)



POST-DEVELOPMENT (CM)



APPENDIX D: RATIONAL METHOD STUDY FORM

TENTATIVE TRACT NO. 18064

Preliminary Hydrology

Please use Isofrequency Maps from Orange County Hydrology Manual, Appendix I or NOAA website for the 10-year, 25-year, and 100-year, 1-hour duration precipitation rates for the purpose of rational method calculations - Typical for all calculations.

85th Percentile Rainfall (inch) = 0.75 ← Soil Group D

EXISTING AREA			Elev 1	Elev 2	Length	Diff	Slope	impervious	Pervious	% imp	%per
	ft ²	ac	ft	ft	ft	ft	ft/ft	ft ²	ft ²	(%)	(%)
Area I	72,729	1.67	72.1	70.62	420.5	1.48	0.004	65,824	6,905	0.905	0.095

RATIONAL METHOD STUDY FORM

ORANGE COUNTY HYDROLOGY MANUAL		STUDY NAME: 1506 West 1st Street, Santa Ana, CA								Calc'd By: T.G		Date: 6/28/2016		
		PRE- DEVELOPMENT								Checked I P.G.		Date: 7/2/2016		
		2-YEAR STORM RATIONAL METHOD STUDY										Page 1 of 1		
Concentration Point	AREA (Acres)		Soil Type	Dev. Type	Tt min	Tc min	I in/hr	Fm in/hr	Fm avg	Q Total	Flow Path	Slope ft/ft	V ft/sec	Hydraulics and Notes
	Subarea	Total												
Area I	1.67	1.67	D	S.F.	-	11.0	1.440	0.0189883	0.018988	2.10	420.5	0.0035	-	INITIAL SUBAREA
														INITIAL SUBAREA
a _p = pervious area fraction			F _p = infiltration rate for pervious area, from soil group											
						AREA I	AREA II							AREA I
				a _p	0.095				F _m =a _p *F _p	=				0.01899
				a _i	0.905				F _p		0.2			
C=0.9 (a _i + (I-F _p)(a _p /I))			C											
				1	2				C					
				a _p /I	I-F _p	2*1	a _i +3							
				I	0.0659	1.240	0.1	1.0	0.8881297					

330' max. for initial area.

Refer to Orange County Hydrology Workbook for sample calculations.
<http://ocflood.com/civicax/filebank/blobload.aspx?BlobID=8338>

TENTATIVE TRACT NO. 18064

Preliminary Hydrology

Please use Isofrequency Maps from Orange County Hydrology Manual, Appendix I or NOAA website for the 10-year, 25-year, and 100-year, 1-hour duration precipitation rates for the purpose of rational method calculations - Typical for all calculations.

85th Percentile Rainfall (inch) = 0.75 ← Soil Group D

PROPOSED AREA		Elev 1	Elev 2	Length	Diff	Slope	impervious	Pervious	% imp	%per	
	ft ²	ac	ft	ft	ft	ft/ft	ft ²	ft ²	(%)	(%)	
Area I	72,729	1.67	72.98	69.94	564	3.04	0.005	55,329	17,400	0.761	0.239

RATIONAL METHOD STUDY FORM

ORANGE COUNTY HYDROLOGY MANUAL		STUDY NAME: 1506 West 1st Street, Santa Ana, CA								Calc'd By: T.G	Date: 6/28/2016			
		POST- DEVELOPMENT								Checked I.P.G.	Date: 7/2/2016			
		2-YEAR STORM RATIONAL METHOD STUDY								Page 1 of 1				
Concentration Point	AREA (Acres)		Soil Type	Dev. Type	Tt min	Tc min	I in/hr	Fm in/hr	Fm avg	Q Total	Flow Path	Slope ft/ft	V ft/sec	Hydraulics and Notes
	Subarea	Total												
Area I	1.67	1.67	D	S.F.	-	12.5	1.338	0.0478489	0.047849	1.91	564	0.0054	-	INITIAL SUBAREA
														INITIAL SUBAREA
a _p = pervious area fraction				F _p = infiltration rate for pervious area, from soil group										
				AREA I		AREA II						AREA I		
				a _p	0.239			F _m = a _p * F _p =		0.04785				
				a _i	0.761			F _p		0.2				
C = 0.9 (a _i + (I - F _p)(a _p /I))				C	0.868									
				1	2			C						
				a _p /I	I - F _p	2*1	a _i +3							
				I	0.1788	1.138	0.2	1.0	0.8678106					

330' max. for initial area.

Refer to Orange County Hydrology Workbook for sample calculations.
<http://ocflood.com/civicax/filebank/blobdload.aspx?BlobID=8338>

TENTATIVE TRACT NO. 18064

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85th Percentile Rainfall (inch) = 0.75 ← Soil Group D

EXISTING AREA			Elev 1	Elev 2	Length	Diff	Slope	impervious	Pervious	% imp	%per
	ft ²	ac	ft	ft	ft	ft	ft/ft	ft ²	ft ²	(%)	(%)
Area I	72,729	1.67	72.1	70.62	420.5	1.48	0.004	65,824	6,905	0.905	0.095

RATIONAL METHOD STUDY FORM

ORANGE COUNTY HYDROLOGY MANUAL		STUDY NAME: 1506 West 1st Street, Santa Ana, CA								Calc'd By: T.G	Date: 6/28/2016			
		PRE- DEVELOPMENT								Checked I.P.G.	Date: 7/2/2016			
		5-YEAR STORM RATIONAL METHOD STUDY								Page 1 of 1				
Concentration Point	AREA (Acres)		Soil Type	Dev. Type	Tt min	Tc min	I in/hr	Fm in/hr	Fm avg	Q Total	Flow Path	Slope ft/ft	V ft/sec	Hydraulics and Notes
	Subarea	Total												
Area I	1.67	1.67	D	S.F.	-	11.0	2.045	0.0189883	0.018988	3.00	420.5	0.0035	-	INITIAL SUBAREA
														INITIAL SUBAREA
a _p = pervious area fraction			F _p = infiltration rate for pervious area, from soil group											
					AREA I	AREA II								AREA I
				a _p	0.095				F _m =a _p *F _p	=	0.01899			
				a _i	0.905				F _p	0.2				
C=0.9 (a _i + (I-F _p)(a _p /I))			C											
				1	2				C					
				a _p /I	I-F _p	2*1	a _i +3							
				I	0.0464	1.845	0.1	1.0	0.8916437					

330' max. for initial area.

Refer to Orange County Hydrology Workbook for sample calculations.
<http://ocflood.com/civicax/filebank/blobload.aspx?BlobID=8338>

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PROPOSED AREA			Elev 1	Elev 2	Length	Diff	Slope	impervious	Pervious	% imp	%per
	ft ²	ac	ft	ft	ft	ft	ft/ft	ft ²	ft ²	(%)	(%)
Area I	72,729	1.67	72.98	69.94	564	3.04	0.005	55,329	17,400	0.761	0.239

RATIONAL METHOD STUDY FORM

ORANGE COUNTY HYDROLOGY MANUAL			STUDY NAME: 1506 West 1st Street, Santa Ana, CA								Calc'd By: T.G		Date: 6/28/2016	
			POST- DEVELOPMENT								Checked I P.G.		Date: 7/2/2016	
			5-YEAR STORM RATIONAL METHOD STUDY										Page 1 of 1	
Concentration Point	AREA (Acres)		Soil Type	Dev. Type	Tt min	Tc min	I in/hr	Fm in/hr	Fm avg	Q Total	Flow Path	Slope ft/ft	V ft/sec	Hydraulics and Notes
	Subarea	Total												
Area I	1.67	1.67	D	S.F.	-	12.5	1.903	0.0478489	0.047849	2.74	564	0.0054	-	INITIAL SUBAREA
														INITIAL SUBAREA
a _p = pervious area fraction			F _p = infiltration rate for pervious area, from soil group											
					AREA I	AREA II								AREA I
				a _p	0.239				F _m = a _p * F _p	=	0.04785			
				a _i	0.761				F _p	0.2				
C = 0.9 (a _i + (I - F _p)(a _p /I))			C			0.877								
				1	2				C					
				a _p /I	I - F _p	2*1	a _i +3							
				I	0.1257	1.703	0.2	1.0	0.8773743					

330' max. for initial area.

Refer to Orange County Hydrology Workbook for sample calculations.
<http://ocflood.com/civicax/filebank/blobload.aspx?BlobID=8338>

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Preliminary Hydrology

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EXISTING AREA		Elev 1	Elev 2	Length	Diff	Slope	impervious	Pervious	% imp	%per	
	ft ²	ac	ft	ft	ft	ft/ft	ft ²	ft ²	(%)	(%)	
Area I	72,729	1.67	72.1	70.62	420.5	1.48	0.004	65,824	6,905	0.905	0.095

RATIONAL METHOD STUDY FORM

ORANGE COUNTY HYDROLOGY MANUAL		STUDY NAME: 1506 West 1st Street, Santa Ana, CA								Calc'd By: T.G	Date: 6/28/2016			
		PRE- DEVELOPMENT								Checked I.P.G.	Date: 7/2/2016			
		10-YEAR STORM RATIONAL METHOD STUDY								Page 1 of 1				
Concentration Point	AREA (Acres)		Soil Type	Dev. Type	Tt min	Tc min	I in/hr	Fm in/hr	Fm avg	Q Total	Flow Path	Slope ft/ft	V ft/sec	Hydraulics and Notes
	Subarea	Total												
Area I	1.67	1.67	D	S.F.	-	11.0	2.584	0.0189883	0.018988	3.79	420.5	0.0035	-	INITIAL SUBAREA
														INITIAL SUBAREA
a _p = pervious area fraction			F _p = infiltration rate for pervious area, from soil group											
						AREA I	AREA II							AREA I
				a _p	0.095				F _m = a _p * F _p	=	0.01899			
				a _i	0.905				F _p	0.2				
C = 0.9 (a _i + (I - F _p)(a _p /I))			C											
				1	2				C					
				a _p /I	I - F _p	2*1	a _i +3							
				I	0.0367	2.384	0.1	1.0	0.893386					

330' max. for initial area.

Refer to Orange County Hydrology Workbook for sample calculations.
<http://ocflood.com/civicax/filebank/blobdload.aspx?BlobID=8338>

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Preliminary Hydrology

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PROPOSED AREA			Elev 1	Elev 2	Length	Diff	Slope	impervious	Pervious	% imp	%per
	ft ²	ac	ft	ft	ft	ft	ft/ft	ft ²	ft ²	(%)	(%)
Area I	72,729	1.67	72.98	69.94	564	3.04	0.005	55,329	17,400	0.761	0.239

RATIONAL METHOD STUDY FORM

ORANGE COUNTY HYDROLOGY MANUAL		STUDY NAME: 1506 West 1st Street, Santa Ana, CA								Calc'd By: T.G	Date: 6/28/2016			
		POST- DEVELOPMENT								Checked I.P.G.	Date: 7/2/2016			
		10-YEAR STORM RATIONAL METHOD STUDY								Page 1 of 1				
Concentration Point	AREA (Acres)		Soil Type	Dev. Type	Tt min	Tc min	I in/hr	Fm in/hr	Fm avg	Q Total	Flow Path	Slope ft/ft	V ft/sec	Hydraulics and Notes
	Subarea	Total												
Area I	1.67	1.67	D	S.F.	-	13.0	2.348	0.0478489	0.047849	3.40	564	0.0054	-	INITIAL SUBAREA
														INITIAL SUBAREA
a _p = pervious area fraction			F _p = infiltration rate for pervious area, from soil group											
					AREA I	AREA II							AREA I	
				a _p	0.239				F _m = a _p * F _p	=			0.04785	
				a _i	0.761				F _p		0.2			
C = 0.9 (a _i + (I - F _p)(a _p /I))				C	0.882									
				1	2				C					
				a _p /I	I - F _p	2*1	a _i +3							
			I	0.1019	2.148	0.2	1.0	0.8816591						

330' max. for initial area.

Refer to Orange County Hydrology Workbook for sample calculations.
<http://ocflood.com/civicax/filebank/blobload.aspx?BlobID=8338>

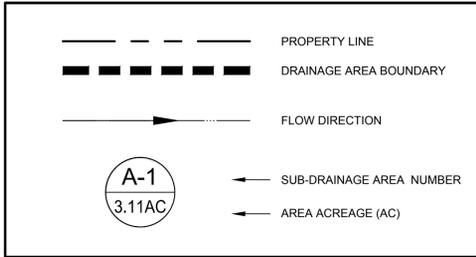
APPENDIX E: HYDROLOGY MAP

- **HYDROLOGY MAP – PRE DEVELOPMENT**
- **HYDROLOGY MAP – POST DEVELOPMENT**

HYDROLOGY MAP - PRE DEVELOPMENT

TENTATIVE TRACT NO. 18064

LEGEND

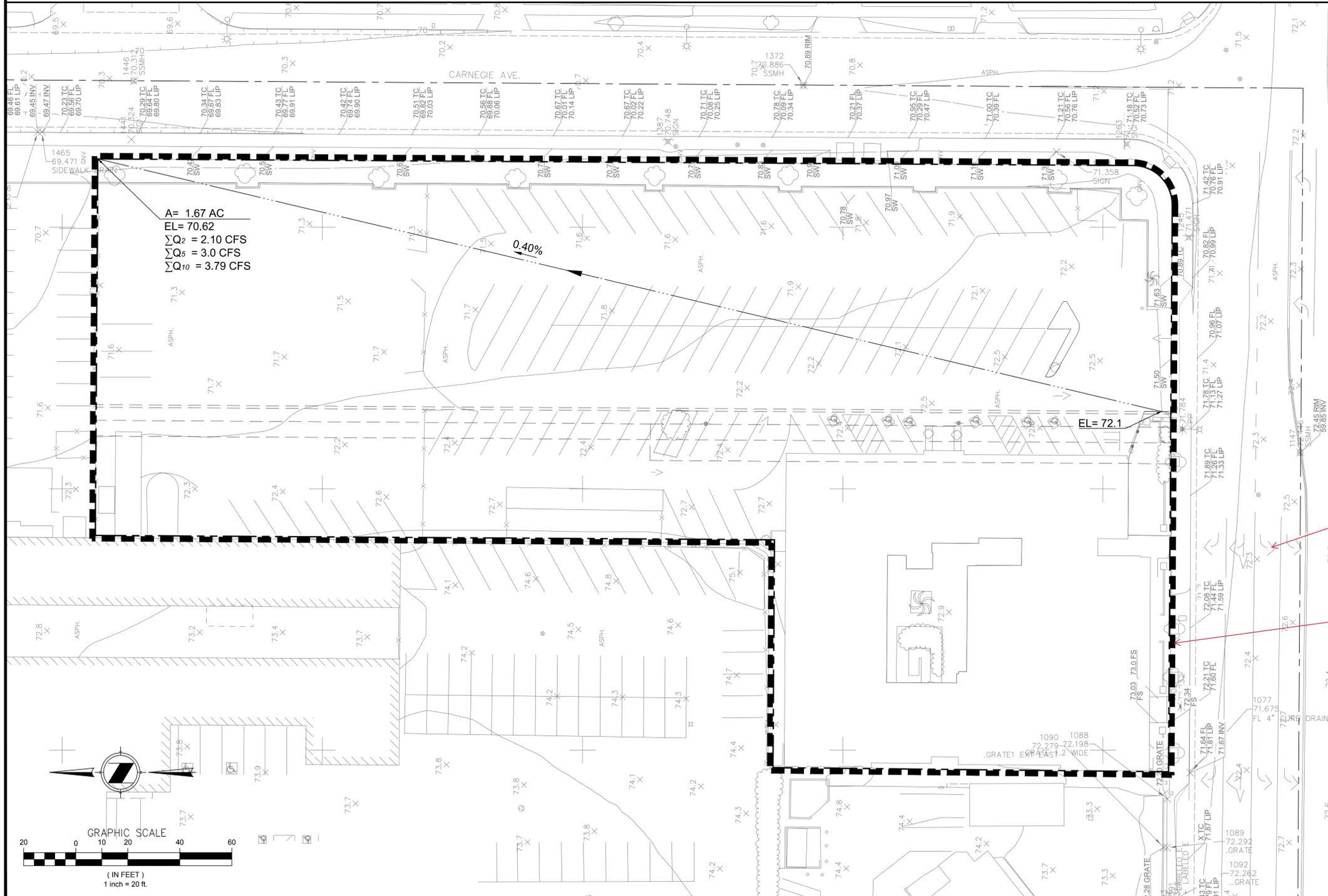
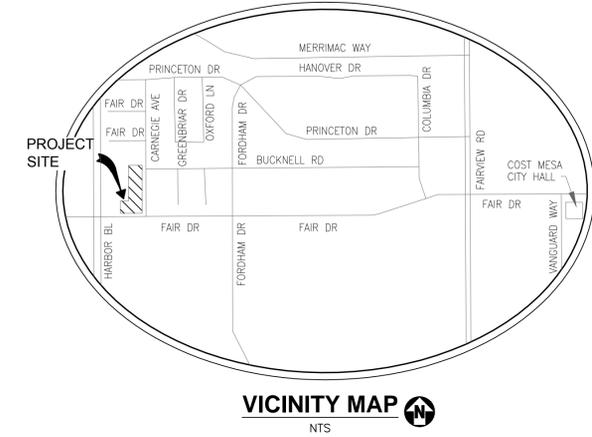


HYDROLOGY INFORMATION

SITE AREA: 1.67 ACRE
 DEV. TYPE: RESIDENTIAL DEVELOPMENT
 SOIL TYPE: "D"
 T_c: Time of Concentration Nomograph
 FREQUENCY: 2-YR, 5-YR AND 10-YR 24-hour
 METHOD: ORANGE COUNTY HYDROLOGY MANUAL RATIONAL METHOD

	AREA		Elev 1	Elev 2	Length	Diff	Slope	Impervious	Pervious	% imp	%per
units	(ft ²)	(ac)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft ²)	(ft ²)	(%)	(%)
Existing Area I	72,729	1.67	72.1	70.62	420.5	1.48	0.004	65,824	6,905	0.905	0.095
Proposed Area I	72,729	1.67	72.98	69.94	564	3.04	0.005	55,329	17,400	0.761	0.239

Initial Area 330' max.



SHEET INDEX

- 1 HYDROLOGY MAP - PRE
- 2 HYDROLOGY MAP - POST

SOILS ENGINEER

ALBUS-KEEFE & ASSOCIATES, INC
 1011 NORTH ARMANDO STREET
 ANAHEIM CA, 92806
 CONTACT: DAVID ALBUS
 TEL: 714-630-1626
 REPORT DATED MAY26, 2016
 JOB NUMBER: 2495.00

GENERAL INFORMATION:

1. GROSS ACREAGE: 1.67 AC
2. 1 LOT TRACT MAP
3. 28 DWELLING UNITS
4. PROPOSED NET DENSITY: 16.25 DU/AC

BASIS OF BEARING

THE BASIS OF BEARING USED FOR THIS PROJECT IS THE BEARING BETWEEN ORANGE COUNTY SURVEYOR GPS STATIONS 6154 AND 6155R1 WHICH IS N00°36'15"E

BENCHMARK

OCS BM CM-31-81 ALUMINUM BENCH MARK DISK AT INTERSECTION OF FAIRVIEW ROAD AND FAIR DRIVE.
 ELEV = 72.27 (NAVD88) 69.875 (NGVD29) 2005 (YEAR LEVELED)

NO.	DATE	REVISION DESCRIPTION
1		

OWNER/DEVELOPER:

DEVELOPMENT
901 DAVIS STREET
SUITE 230
NEWPORT BEACH
CA 92660

SHELDON

ENGINEER:

IDS Group
1 PETERS CANYON ROAD, SUITE 130
IRVINE, CA 92606
TEL: 949-387-8600, FAX: 949-387-0900

DATE:

PROJECT:

440 Fair Drive
Costa Mesa, CA

HYDROLOGY MAP - PRE

JOB NO. 16C004.00

DRAWN BY: TG

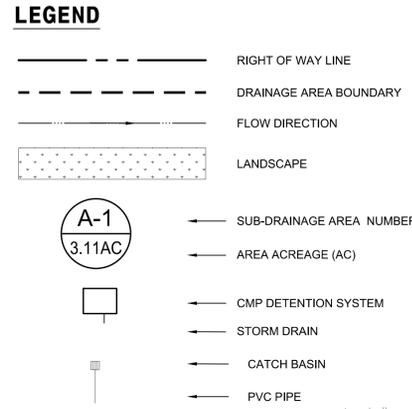
CHECKED BY: PG

DATE:

1
SHEET 1 OF 2

HYDROLOGY MAP - POST DEVELOPMENT

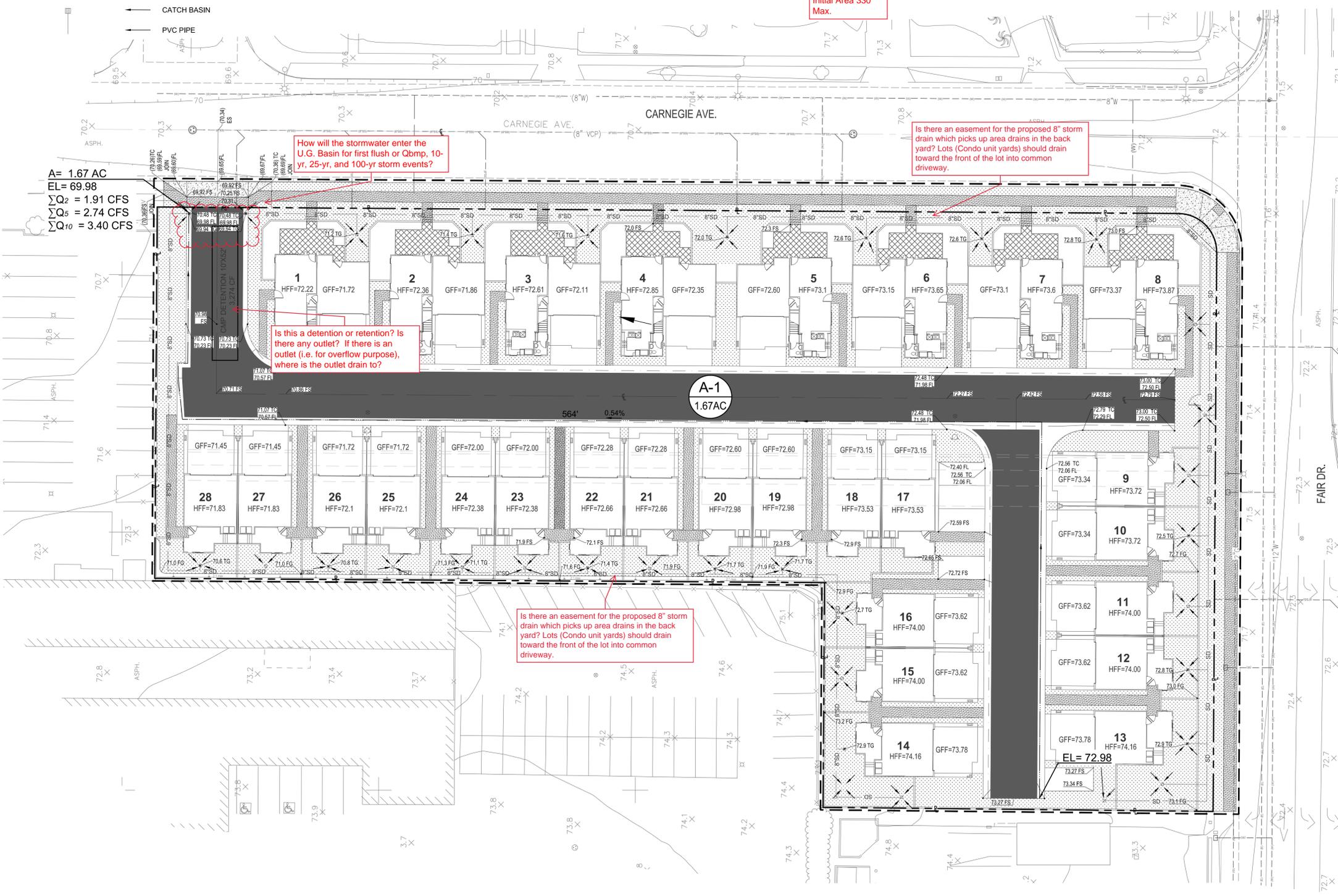
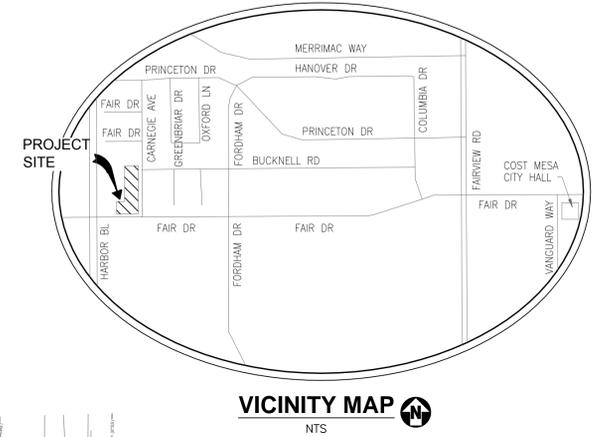
TENTATIVE TRACT NO. 18064



HYDROLOGY INFORMATION

SITE AREA: 1.67 ACRE
 DEV. TYPE: RESIDENTIAL DEVELOPMENT
 SOIL TYPE: "D"
 T_c: Time of Concentration Nomograph
 FREQUENCY: 2-YR, 5-YR AND 10-YR 24-hour
 METHOD: ORANGE COUNTY HYDROLOGY MANUAL RATIONAL METHOD

	AREA	Elev 1	Elev 2	Length	Diff	Slope	Impervious	Pervious	% imp	% per	
units	(ft ²)	(ac)	(ft)	(ft)	(ft)	(ft/ft)	(ft ²)	(ft ²)	(%)	(%)	
Existing Area I	72,729	1.67	72.1	70.62	420.5	1.48	0.004	65,824	6,905	0.905	0.095
Proposed Area I	72,729	1.67	72.98	69.94	564	3.04	0.005	55,329	17,400	0.761	0.239



OWNER/DEVELOPER:	DEVELOPMENT 901 DAVIS STREET SUITE 230 NEWPORT BEACH CA 92660
ENGINEER:	SHeldon PROFESSIONAL ENGINEER & ARCHITECT C 79837 1 PETERS CANYON ROAD, SUITE 130 IRVINE, CA 92606 TEL: 949-387-8600, FAX: 949-387-0900
PROJECT:	440 Fair Drive Costa Mesa, CA
JOB NO.	16C004.00
DRAWN BY:	TG
CHECKED BY:	PG
DATE:	9/1/16
2 SHEET 2 OF 2	
PROJECT:	HYDROLOGY MAP - POST

**Appendix B:
Water Quality Management Plan**

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WQ XX-XXXX

**County of Orange/Santa Ana Region
Priority Project
Water Quality Management Plan
(WQMP)**

Project Name:

**Costa Mesa Residential Development
Tract No. 18064
2507 Carnegie Ave, Costa Mesa, CA**

Prepared for:

**Sheldon Development, LLC
901 Dove Street, Suite 140
Newport Beach, California 92660**

Prepared by:

**Tejal Gandhi
IDS Civil Engineers
1 Peters Canyon Road#130
Irvine, CA 92606**

June 26, 2016

Project Owner's Certification			
Planning Application No. (If applicable)		Grading Permit No.	
Tract/Parcel Map and Lot(s) No.	18064	Building Permit No.	
Address of Project Site and APN (If no address, specify Tract/Parcel Map and Lot Numbers)			440 Fair Dr., Costa Mesa, CA

This Water Quality Management Plan (WQMP) has been prepared for Sheldon Development by IDS Civil Engineers. The WQMP is intended to comply with the requirements of the County of Orange NPDES Stormwater Program requiring the preparation of the plan.

The undersigned, while it owns the subject property, is responsible for the implementation of the provisions of this plan, including the ongoing operation and maintenance of all best management practices (BMPs), and will ensure that this plan is amended as appropriate to reflect up-to-date conditions on the site consistent with the current Orange County Drainage Area Management Plan (DAMP) and the intent of the non-point source NPDES Permit for Waste Discharge Requirements for the County of Orange, Orange County Flood Control District and the incorporated Cities of Orange County within the Santa Ana Region. Once the undersigned transfers its interest in the property, its successors-in-interest shall bear the aforementioned responsibility to implement and amend the WQMP. An appropriate number of approved and signed copies of this document shall be available on the subject site in perpetuity.

Owner:			
Title	Owner		
Company	Sheldon Development, LLC		
Address	901 Dove Street, Suite 140 Newport Beach, California 92660		
Email	steve@sheldongrp.com		
Telephone #	(949)777-9400		
I understand my responsibility to implement the provisions of this WQMP including the ongoing operation and maintenance of the best management practices (BMPs) described herein.			
Owner Signature		Date	

Priority Project – Preliminary Water Quality Management Plan (PWQMP)
16C004.00 Costa Mesa Residential Development

Preparer (Engineer):			
Title	Civil Engineer	PE Registration #	C79637
Company	IDS Civil Engineers		
Address	1 Peters Canyon Road ste. 130		
Email	Tejal.gandhi@idsgi.com		
Telephone #	(949)387-8500 ext. 502		
I hereby certify that this Water Quality Management Plan is in compliance with, and meets the requirements set forth in, Order No. R8-2009-0030/NPDES No. CAS618030, of the Santa Ana Regional Water Quality Control Board.			
Preparer Signature		Date	
Place Stamp Here			

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Section I Permit(s) and Water Quality Conditions of Approval or Issuance

Provide discretionary or grading/building permit information and water quality conditions of approval, or permit issuance, applied to the project. If conditions are unknown, please request applicable conditions from staff. Refer to Section 2.1 in the Technical Guidance Document (TGD) available on the OC Planning website (ocplanning.net).

Project Information	
Permit/Application No. (If applicable)	Grading or Building Permit No. (If applicable)
Address of Project Site (or Tract Map and Lot Number if no address) and APN	2507 Carnegie Ave, Costa Mesa, CA
Water Quality Conditions of Approval or Issuance	
Water Quality Conditions of Approval or Issuance applied to this project. (Please list verbatim.)	N/A at this time
Conceptual WQMP	
Was a Conceptual Water Quality Management Plan previously approved for this project?	No, this is Conceptual WQMP.

Watershed-Based Plan Conditions	
Provide applicable conditions from watershed - based plans including WIHMPs and TMDLS.	A WHIMP has not been developed as of the date of this report.

Section II Project Description

II.1 Project Description

Provide a detailed project description including:

- Project areas;
- Land uses;
- Land cover;
- Design elements;
- A general description not broken down by drainage management areas (DMAs).

Include attributes relevant to determining applicable source controls. Refer to Section 2.2 in the Technical Guidance Document (TGD) for information that must be included in the project description.

Description of Proposed Project				
Development Category (From Model WQMP, Table 7.11-2; or -3):	<u>Category 1:</u> New development projects that create 10,000 square feet or more of impervious surface. This category includes commercial, industrial, residential housing subdivisions, mixed-use, and public projects on private or public property that falls under the planning and building authority or the Permittees.			
Project Area (ft ²): _____	Number of Dwelling Units: _____28_____		SIC Code: N/A (Residential Project)	
Project Area	Pervious		Impervious	
	Area (acres or sq ft)	Percentage	Area (acres or sq ft)	Percentage
Pre-Project Conditions	6,905	10	65,824	90
Post-Project Conditions	17,400	23.9	55,329	76.1
Drainage Patterns/Connections	The site is relatively flat. The pre and post drainage patterns will remain the same, except the site will have BMP system that will treat and retain the stormwater runoff and infiltrate the runoff with CMP detention System. The landscape areas runoff will be collected by area drains. An 8" pipe will then carry the flow from the area drain (located at various location) to the catch basin. Also all the lots and private street will sheet flow to the gutter that will intercept at catch basin. The			

catchbasin includes the triton filters (TR filters) that act as primary treatment. TR Filter is a multipurpose catch basin insert designed to capture sediment, trash, debris, suspended solids, oils & grease and other storm water pollutants. A 12" pipe will then carry the flow from the catchbasin to 96" stormdrain detention system that will retain and infiltrate the 100% Design Captured Volume runoff. Overflow from the catch basin will sheet flow out to the Carnegie street.

Narrative Project
Description:

(Use as much space as
necessary.)

The site is located at 2507 Carnegie Ave within the city of Costa Mesa, California. The property is bordered by a Dodge and Fiat Auto Dealership to the north and northwest, a gas station to the southwest, Fair Drive to the south, and Carnegie Avenue to the east.

Existing Site:

The site is currently occupied by a two-story commercial building (mini-mall) with a large, asphalt paved parking lot. The northern portion of the parking lot area is currently sub-leased and used as car detailing area for a neighboring auto dealership. Associated improvements include some concrete flatwork, underground utilities and a masonry block screen wall along the east margin of the site. Chain-link fencing also bounds the property on the north and west property lines.

Vegetation on site consists of some mature trees along the east property line with some small landscape islands and planters around the building area. Based on Google Earth, topography on site is relatively level at approximately 70 feet above mean sea level. Drainage is generally directed as sheet flow to the south towards Fair Drive.

Proposed Site:

Based on conceptual site plan, the site will developed for construction of eight (8) two-story detached homes and twenty (20) three-story duplex units. The interior streets, parking stalls, decorative hardscape, infiltration system, and underground improvements are also anticipated.

II.2 Potential Stormwater Pollutants

Determine and list expected stormwater pollutants based on land uses and site activities. *Refer to Section 2.2.2 and Table 2.1 in the Technical Guidance Document (TGD) for guidance.*

Pollutants of Concern			
Pollutant	Check One for each:		Additional Information and Comments
	E=Expected to be of concern	N=Not Expected to be of concern	
Suspended-Solid/ Sediment	E <input checked="" type="checkbox"/>	N <input type="checkbox"/>	Residential Use
Nutrients	E <input checked="" type="checkbox"/>	N <input type="checkbox"/>	Residential Use
Heavy Metals	E <input type="checkbox"/>	N <input checked="" type="checkbox"/>	
Pathogens (Bacteria/Virus)	E <input checked="" type="checkbox"/>	N <input type="checkbox"/>	Residential Use
Pesticides	E <input checked="" type="checkbox"/>	N <input type="checkbox"/>	Residential Use
Oil and Grease	E <input checked="" type="checkbox"/>	N <input type="checkbox"/>	Residential Use
Toxic Organic Compounds	E <input type="checkbox"/>	N <input checked="" type="checkbox"/>	
Trash and Debris	E <input checked="" type="checkbox"/>	N <input checked="" type="checkbox"/>	Residential Use

II.3 Hydrologic Conditions of Concern

Determine if streams located downstream from the project area are potentially susceptible to hydromodification impacts. *Refer to Section 2.2.3.1 in the Technical Guidance Document (TGD) for North Orange County or Section 2.2.3.2 for South Orange County.*

No – Show map

Yes – Describe applicable hydrologic conditions of concern below. *Refer to Section 2.2.3 in the Technical Guidance Document (TGD).*

In the North Orange County permit area, HCOC are considered to exist if any streams located downstream from the project area determined to be potentially susceptible to hydromodification impacts and either of the following conditions exists:

Post-development runoff volume for the 2-yr, 24-hr storm event exceeds the the pre-development runoff volume for the 2-yr, 24-hr strom by more than percent

OR

Time of concentration of post-development runoff for the 2-yr, 24-hr storm event exceeds the time of concentration of the pre-development condition for the 2-yr, 24-hr storm event by more than 5 percent.

The project site is susceptible to the hydromodification impact per Appendix XVI maps but the above listed condition does not exist.

Conditions	Area (ac)	Flow rate (cfs)	Time of Concentration Tc (min.)
	Area I	Area I	Area I
Pre-Project	1.67	2.10	11
Post-Project	1.67	1.91	13



The net stormwater runoff for 2-yr, 24-hr storm from the combined areas will decrease by 9% which is below the threshold value by 5%. Therefore, HCOC does not exist and hydromodification does not need to be consider further.

II.4 Post Development Drainage Characteristics

Describe post development drainage characteristics. *Refer to Section 2.2.4 in the Technical Guidance Document (TGD).*

The site is relatively flat. The pre and post drainage patterns will remain the same, except the site will have BMP system that will treat and retain the stormwater runoff and infiltrate the runoff with CMP detention System. All the Units front area and the Private Street sheet flows to gutter. The flow collected in the gutter is intercepted by a catch basin located at the entrance of the site. The landscape areas runoff will be collected by area drains. An 8" pipe will then carry the flow from the area drain (located at various location) to the catch basin. The catchbasin includes the triton filters (TR filters) that act as primary treatment. TR Filter is a multipurpose catch basin insert designed to capture sediment, trash, debris, suspended solids, oils & grease and other storm water pollutants. A 12" pipe will then carry the flow from the catchbasin to 96" stormdrain detention system that will retain and infiltrate the 100% Design Captured Volume runoff. The 85th percentile 24-hr storm event runoff volume will be fully captured and infiltrated by the above system. For Q₁₀ 24-hr storm event, the runoff will sheet flows easterly to the Carnegie Avenue.

There are no existing storm drain systems near property and therefore, the runoff will be collected at the nearest (intersection of Princeton Dr. and Carnegie Ave) catch basin. From there, runoff will be carried out by an existing storm drain system to Paularino Channel to Santa Ana Delhi Channel that eventually will carry out the discharge to the Newport Bay.

II.5 Property Ownership/Management

Describe property ownership/management. *Refer to Section 2.2.5 in the Technical Guidance Document (TGD).*

Presently the property is owned and managed by The Olson Company.

A Home Owner's Association will be established and there will be CC&Rs for the project, therefore, there will be common fund paid into by the property residents. Each home will be owned by an individual private property owner and managed by Home Owner's Association. The Home Owner's association will be responsible for maintenance of the best management practices outlined in this WQMP. No portion of the project site or project will be transferred to a governmental agency. The property owner will adhere to the requirements outlined in the maintenance covenant which will be recorded against the property. None of the infrastructure (other than water-meter) constructed as a part of this project will be transferred to the City, County, State, or any other public entity. The water service will be maintained by the city.

Section III Site Description

III.1 Physical Setting

Fill out table with relevant information. *Refer to Section 2.3.1 in the Technical Guidance Document (TGD).*

Name of Planned Community/Planning Area (if applicable)	N/A
Location/Address	Intersection of Fair Drive and Carnegie Drive
	2507 Carnegie Ave, Costa Mesa, CA
General Plan Land Use Designation	Residential
Zoning	Residential
Acreage of Project Site	1.67
Predominant Soil Type	"D"

III.2 Site Characteristics

Fill out table with relevant information and include information regarding BMP sizing, suitability, and feasibility, as applicable. *Refer to Section 2.3.2 in the Technical Guidance Document (TGD).*

Site Characteristics	
Precipitation Zone	0.75 in/hr.
Topography	The site is located at 2507 Carnegie Ave within the city of Costa Mesa, California. The property is bordered by a Dodge and Fiat Auto Dealership to the north and northwest, a gas station to the southwest, Fair Drive to the south, and Carnegie Avenue to the east.

Site Characteristics	
Drainage Patterns/Connections	The site is relatively flat. Drainage is directed as sheet flow toward Carnegie Avenue.
Soil Type, Geology, and Infiltration Properties	A terrace deposit consists of red- brown sandy clay that is generally damp to moist and very stiff. Below 3 feet, the terrace deposit consists of interlayered sands, silty sands, and sandy silts.
Hydrogeologic (Groundwater) Conditions	Per Geotechnical report, Groundwater was not encountered during this firm’s subsurface exploration to a maximum depth of 51.5 feet below the existing ground surface. A review of the CDMG Seismic Hazard Zone Report 03 indicates that historical high groundwater levels for the general site area is greater than 30 feet below the existing ground surface.
Geotechnical Conditions (relevant to infiltration)	The site is feasible for infiltration. Good percolation below 15 feet
Off-Site Drainage	N/A
Utility and Infrastructure Information	Carnegie Avenue – Water, and Sewer line Fair Drive – Water, sewer, gas and electrical line

III.3 Watershed Description

Fill out table with relevant information and include information regarding BMP sizing, suitability, and feasibility, as applicable. Refer to Section 2.3.3 in the Technical Guidance Document (TGD).

Receiving Waters	New Port Bay Upper
303(d) Listed Impairments	Indicator Bacteria, Chlordane, Copper, DDT, Metals, Nutrients, PCBs, Pesticides, Sediment Toxicity, Sedimentation 
Applicable TMDLs	Sediment, Nutrients, Pathogens, Pesticides, Oil and Grease, Trash and Debris 
Pollutants of Concern for the Project	Bacteria, Nutrients, pesticides, sediments, trash and debris, oxygen demanding substances and oil and grease,
Environmentally Sensitive and Special Biological Significant Areas	N/A

Section IV Best Management Practices (BMPs)

IV. 1 Project Performance Criteria

Describe project performance criteria. Several steps must be followed in order to determine what performance criteria will apply to a project. These steps include:

If the project has an approved WIHMP or equivalent, then any watershed specific criteria must be used and the project can evaluate participation in the approved regional or sub-regional opportunities. (Please ask your assigned planner or plan checker regarding whether your project is part of an approved WIHMP or equivalent.)

Determine applicable hydromodification control performance criteria. *Refer to Section 7.II-2.4.2.2 of the Model WQMP.*

Determine applicable LID performance criteria. *Refer to Section 7.II-2.4.3 of the Model WQMP.*

Determine applicable treatment control BMP performance criteria. *Refer to Section 7.II-3.2.2 of the Model WQMP.*

Calculate the LID design storm capture volume for the project. *Refer to Section 7.II-2.4.3 of the Model WQMP.*

(NOC Permit Area only) Is there an approved WIHMP or equivalent for the project area that includes more stringent LID feasibility criteria or if there are opportunities identified for implementing LID on regional or sub-regional basis?		YES <input type="checkbox"/>	NO <input checked="" type="checkbox"/>
If yes, describe WIHMP feasibility criteria or regional/sub-regional LID opportunities.			

Project Performance Criteria	
<p>If HCOC exists, list applicable hydromodification control performance criteria (Section 7.II-2.4.2.2 in MWQMP)</p>	<p>N/A</p>
<p>List applicable LID performance criteria (Section 7.II-2.4.3 from MWQMP)</p>	<p>The following performance criteria for LID implementation are stated in both permits:</p> <ul style="list-style-type: none"> • Priority Projects must infiltrate, harvest and use, evapotranspire, or biotreat/biofilter, the 85th percentile, 24-hour storm event (Design Capture Volume-DCV). ** • A properly designed biotreatment system may only be considered if infiltration, harvest and use, and evapotranspiration (ET) cannot be feasibly implemented for the full design capture volume. In this case, infiltration, harvest and use, and ET practices must be implemented to the greatest extent feasible and biotreatment may be provided for the remaining design capture volume. (Not needed) <p>**The 85th Percentile, 24-hour storm event DCV will be fully captured by CMP detention System by Contech.</p>
<p>List applicable treatment control BMP performance criteria (Section 7.II-3.2.2 from MWQMP)</p>	<p>N/A</p>

Calculate LID
design storm
capture volume
for Project.

Design Capture Storm Depth at Project Site (at 85th percentile, 24-hr storm event) =
0.75 inches

Area Overall

$$\text{Runoff Coefficient} = ((.75 \times \text{IMP}) + .15) = ((.75 \times 0.761) + .15) = 0.72$$

$$\text{DCV} = C \times d \times A \times 43,560 \text{ sf/ac} \times 1/12 \text{ in/ft}$$

$$\text{DCV} = 0.72 \times 0.75 \times 1.67 \times 43560 \times 1/12 = 3,274 \text{ cf.}$$

See Worksheet B, Attachment E

IV.2. Site Design and Drainage

Refer to Section 2.4.2 in the Technical Guidance Document (TGD).

Due to the soil characteristics per Geotechnical Report and WQMP requirement, CMP detention system is proposed. For this project Contech infiltration system will be used.

The proposed site is very flat. The site has one point of connection to the underground infiltration system for treating the runoff. The footprint of the CMP detention system is 10' x 52'..

The pre and post drainage patterns will remain the same, except the site will have BMP system that will treat and retain the stormwater runoff and infiltrate the runoff with CMP detention System. All the Units front area and the Private Street sheet flows to gutter. The flow collected in the gutter is intercepted by a catch basin located at the entrance of the site. The landscape areas runoff will be collected by area drains. An 8" pipe will then carry the flow from the area drain (located at various location) to the catch basin. The catchbasin includes the triton filters (TR filters) that act as primary treatment. TR Filter is a multipurpose catch basin insert designed to capture sediment, trash, debris, suspended solids, oils & grease and other storm water pollutants. A 12" pipe will then carry the flow from the catchbasin to 96" stormdrain detention system that will retain and infiltrate the 100% Design Captured Volume runoff. The 85th percentile 24-hr storm event runoff volume will be fully captured and infiltrated by the above system. For Q₁₀ 24-hr storm event, the runoff will sheet flows easterly to the Carnegie Avenue.

There are no existing storm drain systems near property and therefore, the runoff will be collected at the nearest (intersection of Princeton Dr. and Carnegie Ave) catch basin. From there, runoff will be carried out by an existing storm drain system to Paularino Channel to Santa Ana Delhi Channel that eventually will carry out the discharge to the Newport Bay.

Design Capture Storm Depth at Project Site (at 85th percentile, 24-hr storm event) = 0.75 inches

Area Overall

$$\text{Runoff Coefficient} = ((.75 \times \text{IMP}) + .15) = ((.75 \times 0.761) + .15) = 0.72$$

$$\text{DCV} = C \times d \times A \times 43,560 \text{ sf/ac} \times 1/12 \text{ in/ft}$$

$$\text{DCV} = 0.72 \times 0.75 \times 1.67 \times 43560 \times 1/12 = 3,274 \text{ cf.}$$

See Worksheet B, Attachment E

IV.3 LID BMP Selection and Project Conformance Analysis

Each sub-section below documents that the proposed design features conform to the applicable project performance criteria via check boxes, tables, calculations, narratives, and/or references to worksheets. *Refer to Section 2.4.2.3 in the Technical Guidance Document (TGD) for selecting LID BMPs and Section 2.4.3 in the Technical Guidance Document (TGD) for conducting conformance analysis with project performance criteria.*

IV.3.1 Hydrologic Source Controls (HSCs) - (not proposed)

If required HSCs are included, fill out applicable check box forms. If the retention criteria are otherwise met with other LID BMPs, include a statement indicating HSCs not required.

Name	Included?
Localized on-lot infiltration	<input type="checkbox"/>
Impervious area dispersion (e.g. roof top disconnection)	<input type="checkbox"/> 
Street trees (canopy interception)	<input type="checkbox"/>
Residential rain barrels (not actively managed)	<input type="checkbox"/>
Green roofs/Brown roofs	<input type="checkbox"/>
Blue roofs	<input type="checkbox"/>
Impervious area reduction (e.g. permeable pavers, site design)	<input type="checkbox"/>
Other:	<input type="checkbox"/>

IV.3.2 Infiltration BMPs

Identify infiltration BMPs to be used in project. If design volume cannot be met, state why.

Name	Included?
Bioretention without underdrains	<input type="checkbox"/>
Rain gardens	<input type="checkbox"/>
Porous landscaping	<input type="checkbox"/>
Infiltration planters	<input type="checkbox"/>
Retention swales	<input type="checkbox"/>
Infiltration trenches	<input type="checkbox"/>
Infiltration basins	<input type="checkbox"/>
Drywells	<input type="checkbox"/>
Subsurface infiltration galleries	<input type="checkbox"/>
French drains	<input type="checkbox"/>
Permeable asphalt	<input type="checkbox"/>
Permeable concrete	<input type="checkbox"/>
Permeable concrete pavers	<input type="checkbox"/>
CMP Detention System	<input checked="" type="checkbox"/>
Other:	<input type="checkbox"/>

Show calculations below to demonstrate if the LID Design Storm Capture Volume can be met with infiltration BMPs. If not, document how much can be met with infiltration and document why it is not feasible to meet the full volume with infiltration BMPs.

Design Capture Storm Depth at Project Site (at 85th percentile, 24-hr storm event) = 0.75 inches

Area Overall

Runoff Coefficient = $((.75 \times \text{IMP}) + .15) = ((.75 \times 0.761) + .15) = 0.72$

DCV = $C \times d \times A \times 43,560 \text{ sf/ac} \times 1/12 \text{ in/ft}$

DCV = $0.72 \times 0.75 \times 1.67 \times 43560 \times 1/12 = 3,274 \text{ cf.}$

See Worksheet B, Attachment E

IV.3.3 Evapotranspiration, Rainwater Harvesting BMPs (not Proposed)

If the full Design Storm Capture Volume cannot be met with infiltration BMPs, describe any evapotranspiration and/or rainwater harvesting BMPs included.

Name	Included?
All HSCs; <i>See Section IV.3.1</i>	<input type="checkbox"/>
Surface-based infiltration BMPs	<input type="checkbox"/>
Biotreatment BMPs	<input type="checkbox"/>
Above-ground cisterns and basins	<input type="checkbox"/>
Underground detention	<input type="checkbox"/>
Other:	<input type="checkbox"/>
Other:	<input type="checkbox"/>
Other:	<input type="checkbox"/>

Show calculations below to demonstrate if the LID Design Storm Capture Volume can be met with evapotranspiration and/or rainwater harvesting BMPs in combination with infiltration BMPs. If not, document below how much can be met with either infiltration BMPs, evapotranspiration, rainwater harvesting BMPs, or a combination, and document why it is not feasible to meet the full volume with these BMP categories.

N/A

IV.3.4 Biotreatment BMPs (Not Proposed)

If the full Design Storm Capture Volume cannot be met with infiltration BMPs, and/or evapotranspiration and rainwater harvesting BMPs, describe biotreatment BMPs included. Include sections for selection, suitability, sizing, and infeasibility, as applicable.

Name	Included?
Bioretention with underdrains	<input type="checkbox"/>
Stormwater planter boxes with underdrains	<input type="checkbox"/>
Rain gardens with underdrains	<input type="checkbox"/>
Constructed wetlands	<input type="checkbox"/>
Vegetated swales	<input type="checkbox"/>
Vegetated filter strips	<input type="checkbox"/>
Proprietary vegetated biotreatment systems	<input type="checkbox"/>
Wet extended detention basin	<input type="checkbox"/>
Dry extended detention basins	<input type="checkbox"/>
Other:	<input type="checkbox"/>

Show calculations below to demonstrate if the LID Design Storm Capture Volume can be met with infiltration, evapotranspiration, rainwater harvesting and/or biotreatment BMPs. If not, document how much can be met with either infiltration BMPs, evapotranspiration, rainwater harvesting BMPs, or a combination, and document why it is not feasible to meet the full volume with these BMP categories.

N/A

IV.3.5 Hydromodification Control BMPs (Not Proposed)

Describe hydromodification control BMPs. *See Section 5 of the Technical Guidance Document (TGD).* Include sections for selection, suitability, sizing, and infeasibility, as applicable. Detail compliance with Prior Conditions of Approval (if applicable).

Hydromodification Control BMPs	
BMP Name	BMP Description

IV.3.6 Regional/Sub-Regional LID BMPs (N/A)

Describe regional/sub-regional LID BMPs in which the project will participate. *Refer to Section 7.II-2.4.3.2 of the Model WQMP.*

Regional/Sub-Regional LID BMPs
N/A

IV.3.7 Treatment Control BMPs (N/A)

Treatment control BMPs can only be considered if the project conformance analysis indicates that it is not feasible to retain the full design capture volume with LID BMPs. Describe treatment control BMPs including sections for selection, sizing, and infeasibility, as applicable.

Treatment Control BMPs	
BMP Name	BMP Description

Pretreatment/Gross Solids Removal BMP	
BMP Name	BMP Description
Catch Basin Inserts	Pretreatment to remove pollutants such as trash, debris and sediments.

IV.3.8 Non-structural Source Control BMPs

Fill out non-structural source control check box forms or provide a brief narrative explaining if non-structural source controls were not used.

Non-Structural Source Control BMPs				
Identifier	Name	Check One		If not applicable, state brief reason
		Included	Not Applicable	
N1	Education for Property Owners, Tenants and Occupants	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
N2	Activity Restrictions	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
N3	Common Area Landscape Management	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
N4	BMP Maintenance	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
N5	Title 22 CCR Compliance (How development will comply)	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Residential Project - Hazardous material is not stored onsite
N6	Local Industrial Permit Compliance	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Residential Project
N7	Spill Contingency Plan	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
N8	Underground Storage Tank Compliance	<input type="checkbox"/>	<input checked="" type="checkbox"/>	No Underground Storage Tank
N9	Hazardous Materials Disclosure Compliance	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Residential Project - Hazardous material is not stored onsite
N10	Uniform Fire Code Implementation	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Residential Project
N11	Common Area Litter Control	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
N12	Employee Training	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
N13	Housekeeping of Loading Docks	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
N14	Common Area Catch Basin Inspection	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
N15	Street Sweeping Private Streets and Parking Lots	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
N16	Retail Gasoline Outlets	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Residential Project

IV.3.9 Structural Source Control BMPs

Fill out structural source control check box forms or provide a brief narrative explaining if structural source controls were not used.

Structural Source Control BMPs				
Identifier	Name	Check One		If not applicable, state brief reason
		Included	Not Applicable	
S1	Provide storm drain system stenciling and signage	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
S2	Design and construct outdoor material storage areas to reduce pollution introduction	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Not proposed
S3	Design and construct trash and waste storage areas to reduce pollution introduction	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Not proposed
S4	Use efficient irrigation systems & landscape design, water conservation, smart controllers, and source control	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
S5	Protect slopes and channels and provide energy dissipation	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Flat Land No Channel
	Incorporate requirements applicable to individual priority project categories (from SDRWQCB NPDES Permit)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
S6	Dock areas	<input type="checkbox"/>	<input checked="" type="checkbox"/>	No Dock areas
S7	Maintenance bays	<input type="checkbox"/>	<input checked="" type="checkbox"/>	No Maintenance bays
S8	Vehicle wash areas	<input type="checkbox"/>	<input checked="" type="checkbox"/>	No Vehicle wash areas
S9	Outdoor processing areas	<input type="checkbox"/>	<input checked="" type="checkbox"/>	No Outdoor processing areas
S10	Equipment wash areas	<input type="checkbox"/>	<input checked="" type="checkbox"/>	No Equipment wash areas
S11	Fueling areas	<input type="checkbox"/>	<input checked="" type="checkbox"/>	No Fueling areas
S12	Hillside landscaping	<input type="checkbox"/>	<input checked="" type="checkbox"/>	No Hillside landscaping
S13	Wash water control for food preparation areas	<input type="checkbox"/>	<input checked="" type="checkbox"/>	No Wash water control for food preparation areas
S14	Community car wash racks	<input type="checkbox"/>	<input checked="" type="checkbox"/>	No Community car wash racks

IV.4 Alternative Compliance Plan (If Applicable)

Describe an alternative compliance plan (if applicable). Include alternative compliance obligations (i.e., gallons, pounds) and describe proposed alternative compliance measures. Refer to Section 7.II 3.0 in the WQMP.

IV.4.1 Water Quality Credits

Determine if water quality credits are applicable for the project. Refer to Section 3.1 of the Model WQMP for description of credits and Appendix VI of the Technical Guidance Document (TGD) for calculation methods for applying water quality credits.

Description of Proposed Project				
Project Types that Qualify for Water Quality Credits (Select all that apply):				
<input checked="" type="checkbox"/> Redevelopment projects that reduce the overall impervious footprint of the project site.	<input type="checkbox"/> Brownfield redevelopment, meaning redevelopment, expansion, or reuse of real property which may be complicated by the presence or potential presence of hazardous substances, pollutants or contaminants, and which have the potential to contribute to adverse ground or surface WQ if not redeveloped.	<input type="checkbox"/> Higher density development projects which include two distinct categories (credits can only be taken for one category): those with more than seven units per acre of development (lower credit allowance); vertical density developments, for example, those with a Floor to Area Ratio (FAR) of 2 or those having more than 18 units per acre (greater credit allowance).		
<input type="checkbox"/> Mixed use development, such as a combination of residential, commercial, industrial, office, institutional, or other land uses which incorporate design principles that can demonstrate environmental benefits that would not be realized through single use projects (e.g. reduced vehicle trip traffic with the potential to reduce sources of water or air pollution).	<input type="checkbox"/> Transit-oriented developments, such as a mixed use residential or commercial area designed to maximize access to public transportation; similar to above criterion, but where the development center is within one half mile of a mass transit center (e.g. bus, rail, light rail or commuter train station). Such projects would not be able to take credit for both categories, but may have greater credit assigned		<input type="checkbox"/> Redevelopment projects in an established historic district, historic preservation area, or similar significant city area including core City Center areas (to be defined through mapping).	
<input type="checkbox"/> Developments with dedication of undeveloped portions to parks, preservation areas and other pervious uses.	<input type="checkbox"/> Developments in a city center area.	<input type="checkbox"/> Developments in historic districts or historic preservation areas.	<input type="checkbox"/> Live-work developments, a variety of developments designed to support residential and vocational needs together – similar to criteria to mixed use development; would not be able to take credit for both categories.	<input type="checkbox"/> In-fill projects, the conversion of empty lots and other underused spaces into more beneficially used spaces, such as residential or commercial areas.

Calculation of Water Quality Credits (if applicable)	
---	--

IV.4.2 Alternative Compliance Plan Information

Describe an alternative compliance plan (if applicable). Include alternative compliance obligations (i.e., gallons, pounds) and describe proposed alternative compliance measures. *Refer to Section 7.II 3.0 in the Model WQMP.*

N/A

Section V Inspection/Maintenance Responsibility for BMPs

See Attachment D Operations and Maintenance (O&M) Plan

Section VI BMP Exhibit (Site Plan)

VI.1 BMP Exhibit (Site Plan)

Include a BMP Exhibit (Site Plan), at a size no less than 24" by 36," which includes the following minimum information:

- Insert in the title block (lower right hand corner) of BMP Exhibit: the WQMP Number (assigned by staff) and the grading/building or Planning Application permit numbers
- Project location (address, tract/lot number(s), etc.)
- Site boundary
- Land uses and land covers, as applicable
- Suitability/feasibility constraints
- Structural BMP locations
- Drainage delineations and flow information
- Delineate the area being treated by each structural BMP
- GIS coordinates for LID and Treatment Control BMPs
- Drainage connections
- BMP details
- Preparer name and stamp

Please do not include any areas outside of the project area or any information not related to drainage or water quality. The approved BMP Exhibit (Site Plan) shall be submitted as a plan sheet on all grading and building plan sets submitted for plan check review and approval. The BMP Exhibit shall be at the same size as the rest of the plan sheets in the submittal and shall have an approval stamp and signature prior to plan check submittal.

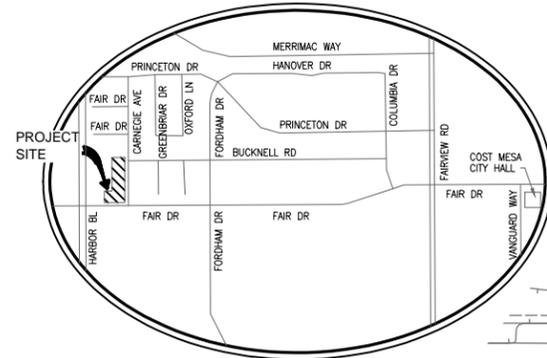
VI.2 Submittal and Recordation of Water Quality Management Plan

Following approval of the Final Project-Specific WQMP, three copies of the approved WQMP (including BMP Exhibit, Operations and Maintenance (O&M) Plan, and Appendices) shall be submitted. In addition, these documents shall be submitted in a PDF format.

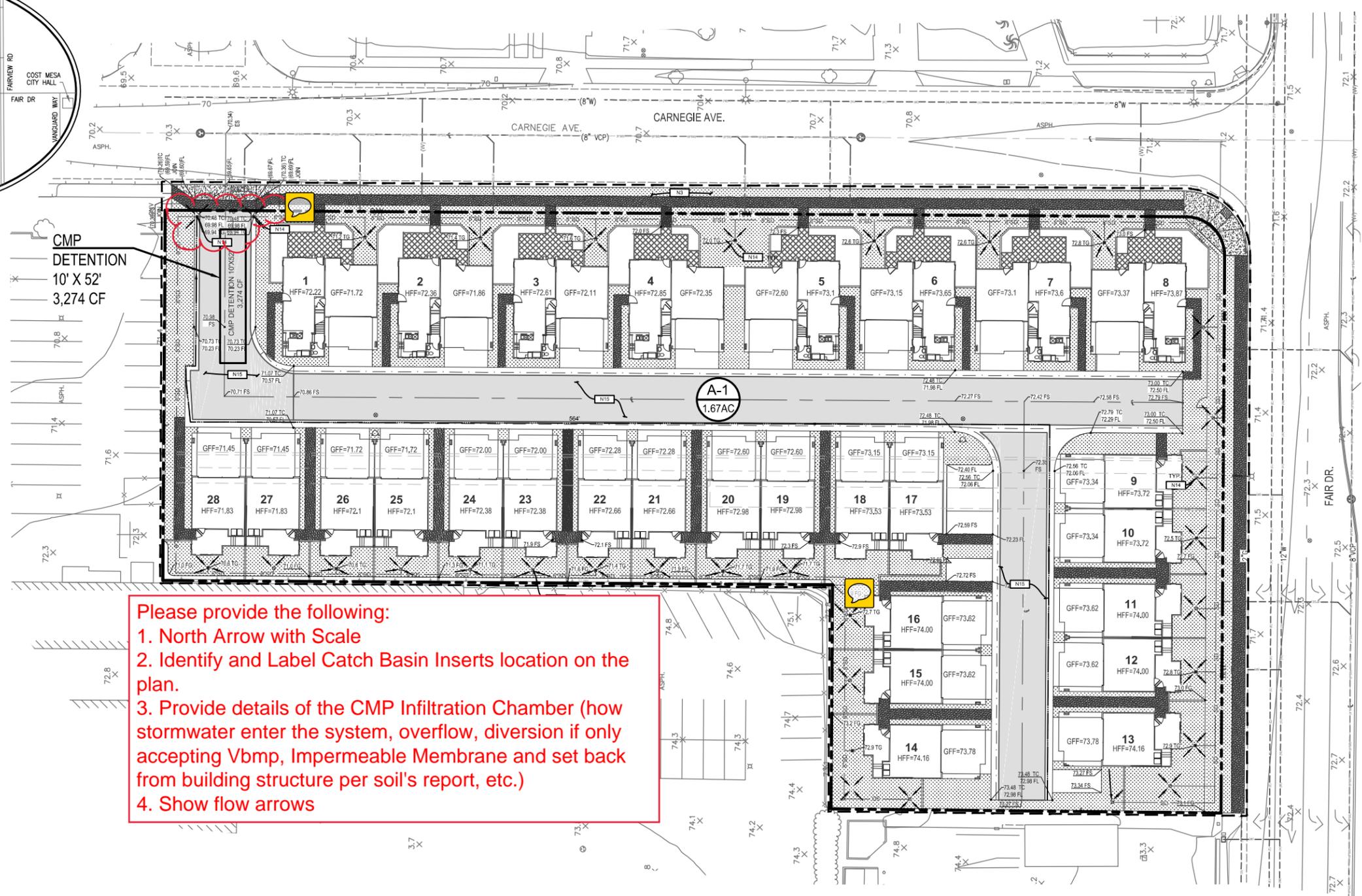
Each approved WQMP (including BMP Exhibit, Operations and Maintenance (O&M) Plan, and Appendices) shall be recorded in the Orange County Clerk-Recorder's Office, prior to close-out of grading and/or building permit. Educational Materials are not required to be included.

PRELIMINARY WATER QUALITY MANAGEMENT (WQMP) PLAN

TENTATIVE TRACT NO. 18064



VICINITY MAP
NTS



LEGEND

- RIGHT OF WAY LINE
- DRAINAGE AREA BOUNDARY
- FLOW DIRECTION
- LANDSCAPE
- SUB-DRAINAGE AREA NUMBER
- AREA ACREAGE (AC)
- CMP DETENTION SYSTEM
- STORM DRAIN
- BMPs
- CATCH BASIN
- PVC PIPE



CATCHBASIN STENCIL

Please provide the following:

1. North Arrow with Scale
2. Identify and Label Catch Basin Inserts location on the plan.
3. Provide details of the CMP Infiltration Chamber (how stormwater enter the system, overflow, diversion if only accepting Vbmp, Impermeable Membrane and set back from building structure per soil's report, etc.)
4. Show flow arrows

BMPs (Non-structural) Proposed

- N3 Common Area Landscape Management
- N14 Common Area Catch Basin Inspection
- N15 Street Sweeping Private Streets

BMPs (Structural) Proposed

- RET- UNDERGROUND INFILTRATION
- CMP CORRUGATED METAL PIPE DETENTION SYSTEM
- PRELIMINARY TREATMENT
- TRITON CURB CATCHBASIN INSERTS
- INLET FILTER

NO.	AREA	DESIGN VOLUME	CAPACITY	IMPER.
	(square feet)	(cf)	(cf)	(%)
AREA I	72,729	3,274	3,380	76.1

<p>OWNER/DEVELOPER:</p> <p>SHELDON DEVELOPMENT 901 DOVE STREET, SUITE 230 NEWPORT BEACH, CA 92660</p>	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th>NO.</th> <th>DATE</th> <th>REVISION DESCRIPTION</th> </tr> <tr> <td> </td> <td> </td> <td> </td> </tr> <tr> <td> </td> <td> </td> <td> </td> </tr> </table>	NO.	DATE	REVISION DESCRIPTION						
NO.	DATE	REVISION DESCRIPTION								
<p>ENGINEER: IDS Group 1 PETERS CANYON ROAD, SUITE 130 IRVINE, CA 92614 TEL: 949-387-8500, FAX: 949-387-0800</p>										
<p>PROJECT: 2507 Carnegie Avenue Costa Mesa, CA</p>										
<p>PRELIMINARY WQMP PLAN</p>										
<p>JOB NO. 16C004.00</p> <p>DRAWN BY: TG</p> <p>CHECKED BY: PG</p> <p>DATE: 7/20/16</p>										
<p>1</p> <p>SHEET 1 OF 1</p>										

Section VII Educational Materials

Refer to the Orange County Stormwater Program (ocwatersheds.com) for a library of materials available. Please only attach the educational materials specifically applicable to this project. Other materials specific to the project may be included as well and must be attached.

Education Materials			
Residential Material (http://www.ocwatersheds.com)	Check If Applicable	Business Material (http://www.ocwatersheds.com)	Check If Applicable
The Ocean Begins at Your Front Door	<input checked="" type="checkbox"/>	Tips for the Automotive Industry	<input type="checkbox"/>
Tips for Car Wash Fund-raisers	<input checked="" type="checkbox"/>	Tips for Using Concrete and Mortar	<input type="checkbox"/>
Tips for the Home Mechanic	<input checked="" type="checkbox"/>	Tips for the Food Service Industry	<input type="checkbox"/>
Homeowners Guide for Sustainable Water Use	<input checked="" type="checkbox"/>	Proper Maintenance Practices for Your Business	<input type="checkbox"/>
Household Tips	<input checked="" type="checkbox"/>	Other Material	Check If Attached
Proper Disposal of Household Hazardous Waste	<input checked="" type="checkbox"/>		
Recycle at Your Local Used Oil Collection Center (North County)	<input checked="" type="checkbox"/>		<input type="checkbox"/>
Recycle at Your Local Used Oil Collection Center (Central County)	<input type="checkbox"/>		<input type="checkbox"/>
Recycle at Your Local Used Oil Collection Center (South County)	<input type="checkbox"/>		<input type="checkbox"/>
Tips for Maintaining a Septic Tank System	<input type="checkbox"/>		<input type="checkbox"/>
Responsible Pest Control	<input checked="" type="checkbox"/>		<input type="checkbox"/>
Sewer Spill	<input type="checkbox"/>		<input type="checkbox"/>
Tips for the Home Improvement Projects	<input checked="" type="checkbox"/>		<input type="checkbox"/>
Tips for Horse Care	<input type="checkbox"/>		<input type="checkbox"/>
Tips for Landscaping and Gardening	<input checked="" type="checkbox"/>		<input type="checkbox"/>
Tips for Pet Care	<input checked="" type="checkbox"/>		<input type="checkbox"/>
Tips for Pool Maintenance	<input type="checkbox"/>		<input type="checkbox"/>
Tips for Residential Pool, Landscape and Hardscape Drains	<input type="checkbox"/>		<input type="checkbox"/>
Tips for Projects Using Paint	<input checked="" type="checkbox"/>		<input type="checkbox"/>

Attachment A

Educational Materials



Support from Orange County residents and businesses is needed to improve water quality and reduce urban runoff pollution. Proper use and disposal of materials will help stop pollution before it reaches the storm drain and the ocean.

Stormwater quality management programs have been developed throughout Orange County to educate and encourage the public to protect water quality, monitor runoff in the storm drain system, investigate illegal dumping and maintain storm drains.

Non-point source pollution can have a serious impact on water quality in Orange County. Pollutants from the storm drain system can harm marine life as well as coastal and wetland habitats. They can also degrade recreation areas such as beaches, harbors and bays.



The Effect on the Ocean



- Automotive leaks and spills.
- Improper disposal of used oil and other engine fluids.
- Metals found in vehicle exhaust, weathered paint, rust, metal plating and tires.
- Pesticides and fertilizers from lawns, gardens and farms.
- Improper disposal of cleaners, paint and paint removers.
- Soil erosion and dust debris from landscape and construction activities.
- Litter, lawn clippings, animal waste, and other organic matter.
- Oil stains on parking lots and paved surfaces.

Sources of Non-Point Source Pollution

- Anything we use outside homes, vehicles and businesses – like motor oil, paint, pesticides, fertilizers and cleaners – can be blown or washed into storm drains.
- A little water from a garden hose or rain can also send materials into storm drains.
- Storm drains are separate from our sanitary sewer systems; unlike water in sanitary sewers (from sinks or toilets), water in storm drains is not treated before entering our waterways.

Where Does It Go?

- Most people believe that the largest source of water pollution in urban areas comes from specific sources such as factories and sewage treatment plants. In fact, the largest source of water pollution comes from city streets, neighborhoods, construction sites and parking lots. This type of pollution is sometimes called “non-point source” pollution.
- There are two types of non-point source pollution: stormwater and urban runoff.
- Stormwater runoff results from rainfall.
- When rainstorms cause large volumes of water to rinse the urban landscape, picking up pollutants along the way.
- Urban runoff can happen any time of the year when excessive water use from irrigation, vehicle washing and other sources carries trash, lawn clippings and other urban pollutants into storm drains.

Did You Know?

Even if you live miles from the Pacific Ocean, you may be unknowingly polluting it.

Dumping one quart of motor oil into a storm drain can contaminate 250,000 gallons of water.

For More Information

California Environmental Protection Agency

www.calepa.ca.gov

- **Air Resources Board**
www.arb.ca.gov
- **Department of Pesticide Regulation**
www.cdpr.ca.gov
- **Department of Toxic Substances Control**
www.dtsc.ca.gov
- **Integrated Waste Management Board**
www.ciwmb.ca.gov
- **Office of Environmental Health Hazard Assessment**
www.oehha.ca.gov
- **State Water Resources Control Board**
www.waterboards.ca.gov

Earth 911 - Community-Specific Environmental Information 1-800-cleanup or visit www.1800cleanup.org

Health Care Agency's Ocean and Bay Water Closure and Posting Hotline
(714) 433-6400 or visit www.ocbeachinfo.com

Integrated Waste Management Dept. of Orange County (714) 834-6752 or visit www.oclandfills.com for information on household hazardous waste collection centers, recycling centers and solid waste collection

O.C. Agriculture Commissioner
(714) 447-7100 or visit www.ocagcomm.com

Stormwater Best Management Practice Handbook
Visit www.cabmphandbooks.com

UC Master Gardener Hotline
(714) 708-1646 or visit www.uccecmg.com

The Orange County Stormwater Program has created and moderates an electronic mailing list to facilitate communications, take questions and exchange ideas among its users about issues and topics related to stormwater and urban runoff and the implementation of program elements. To join the list, please send an email to ocstormwaterinfo-join@list.ocwatersheds.com

Orange County Stormwater Program

Aliso Viejo	(949)	425-2535
Anaheim Public Works Operations	(714)	765-6860
Brea Engineering	(714)	990-7666
Buena Park Public Works	(714)	562-3655
Costa Mesa Public Services	(714)	754-5323
Cypress Public Works	(714)	229-6740
Dana Point Public Works	(949)	248-3584
Fountain Valley Public Works	(714)	593-4441
Fullerton Engineering Dept.	(714)	738-6853
Garden Grove Public Works	(714)	741-5956
Huntington Beach Public Works	(714)	536-5431
Irvine Public Works	(949)	724-6315
La Habra Public Services	(562)	905-9792
La Palma Public Works	(714)	690-3310
Laguna Beach Water Quality	(949)	497-0378
Laguna Hills Public Services	(949)	707-2650
Laguna Niguel Public Works	(949)	362-4337
Laguna Woods Public Works	(949)	639-0500
Lake Forest Public Works	(949)	461-3480
Los Alamitos Community Dev.	(562)	431-3538
Mission Viejo Public Works	(949)	470-3056
Newport Beach, Code & Water Quality Enforcement	(949)	644-3215
Orange Public Works	(714)	532-6480
Placentia Public Works	(714)	993-8245
Rancho Santa Margarita	(949)	635-1800
San Clemente Environmental Programs	(949)	361-6143
San Juan Capistrano Engineering	(949)	234-4413
Santa Ana Public Works	(714)	647-3380
Seal Beach Engineering	(562)	431-2527 x317
Stanton Public Works	(714)	379-9222 x204
Tustin Public Works/Engineering	(714)	573-3150
Villa Park Engineering	(714)	998-1500
Westminster Public Works/Engineering	(714)	898-3311 x446
Yorba Linda Engineering	(714)	961-7138
Orange County Stormwater Program	(877)	897-7455
Orange County 24-Hour Water Pollution Problem Reporting Hotline 1-877-89-SPILL (1-877-897-7455)		

On-line Water Pollution Problem Reporting Form
www.ocwatersheds.com



Printed on Recycled Paper

The Ocean Begins at Your Front Door



The Ocean Begins at Your Front Door



Never allow pollutants to enter the street, gutter or storm drain!

Follow these simple steps to help reduce water pollution:

Household Activities

- Do not rinse spills with water. Use dry cleanup methods such as applying cat litter or another absorbent material, sweep and dispose of in the trash. Take items such as used or excess batteries, oven cleaners, automotive fluids, painting products and cathode ray tubes, like TVs and computer monitors, to a Household Hazardous Waste Collection Center (HHWCC).
- For a HHWCC near you call (714) 834-6752 or visit www.oilandfills.com.
- Do not hose down your driveway, sidewalk or patio to the street, gutter or storm drain. Sweep up debris and dispose of it in the trash.

Automotive

- Take your vehicle to a commercial car wash whenever possible. If you wash your vehicle at home, choose soaps, cleaners, or detergents labeled non-toxic, phosphate-free or biodegradable. Vegetable and citrus-based products are typically safest for the environment.
- Do not allow washwater from vehicle washing to drain into the street, gutter or storm drain. Excess washwater should be disposed of in the sanitary sewer (through a sink or toilet) or onto an absorbent surface like your lawn.
- Monitor your vehicles for leaks and place a pan under leaks. Keep your vehicles well maintained to stop and prevent leaks.
- Never pour oil or antifreeze in the street, gutter or storm drain. Recycle these substances at a service station, a waste oil collection center or used oil recycling center. For the nearest Used Oil Collection Center call 1-800-CLEANUP or visit www.1800cleanup.org.

Pool Maintenance

- Pool and spa water must be dechlorinated and free of excess acid, alkali or color to be allowed in the street, gutter or storm drain.
- When it is not raining, drain dechlorinated pool and spa water directly into the sanitary sewer.
- Some cities may have ordinances that do not allow pool water to be disposed of in the storm drain. Check with your city.

Landscape and Gardening

- Do not over-water. Water your lawn and garden by hand to control the amount of water you use or set irrigation systems to reflect seasonal water needs. If water flows off your yard onto your driveway or sidewalk, your system is over-watering. Periodically inspect and fix leaks and misdirected sprinklers.
- Do not rake or blow leaves, clippings or pruning waste into the street, gutter or storm drain. Instead, dispose of waste by composting, hauling it to a permitted landfill, or as green waste through your city's recycling program.
- Follow directions on pesticides and fertilizer, (measure, do not estimate amounts) and do not use if rain is predicted within 48 hours.
- Take unwanted pesticides to a HHWCC to be recycled. For locations and hours of HHWCC, call (714) 834-6752 or visit www.oilandfills.com.

Trash

- Place trash and litter that cannot be recycled in securely covered trash cans.
- Whenever possible, buy recycled products.
- Remember: Reduce, Reuse, Recycle.

Pet Care

- Always pick up after your pet. Flush waste down the toilet or dispose of it in the trash. Pet waste, if left outdoors, can wash into the street, gutter or storm drain.
- If possible, bathe your pets indoors. If you must bathe your pet outside, wash it on your lawn or another absorbent/permeable surface to keep the washwater from entering the street, gutter or storm drain.
- Follow directions for use of pet care products and dispose of any unused products at a HHWCC.

Common Pollutants

Home Maintenance

- Detergents, cleaners and solvents
- Oil and latex paint
- Swimming pool chemicals
- Outdoor trash and litter

Lawn and Garden

- Pet and animal waste
- Pesticides
- Clippings, leaves and soil
- Fertilizer

Automobile

- Oil and grease
- Radiator fluids and antifreeze
- Cleaning chemicals
- Brake pad dust



Clean beaches and healthy creeks, rivers, bays and ocean are important to Orange County. However, many common activities such as pest control can lead to water pollution if you're not careful. Pesticide treatments must be planned and applied properly to ensure that pesticides do not enter the street, gutter or storm drain. Unlike water in sanitary sewers (from sinks and toilets), water in storm drains is not treated before entering our waterways.

You would never dump pesticides into the ocean, so don't let it enter the storm drains. Pesticides can cause significant damage to our environment if used improperly. If you are thinking of using a pesticide to control a pest, there are some important things to consider.

For more information,
please call
University of California Cooperative
Extension Master Gardeners at
(714) 708-1646
or visit these Web sites:
www.uccemg.org
www.ipm.ucdavis.edu

For instructions on collecting a specimen
sample visit the Orange County
Agriculture Commissioner's website at:
http://www.ocagcomm.com/ser_lab.asp

To report a spill, call the
**Orange County 24-Hour
Water Pollution Problem
Reporting Hotline**
at 1-877-89-SPILL (1-877-897-7455).

For emergencies, dial 911.

Information From:
Cheryl Wilen, Area IPM Advisor; Darren Haver,
Watershed Management Advisor; Mary
Louise Flint, IPM Education and Publication
Director; Pamela M. Geisel, Environmental
Horticulture Advisor; Carolyn L. Unruh,
University of California Cooperative
Extension staff writer. Photos courtesy of
the UC Statewide IPM Program and
Darren Haver.

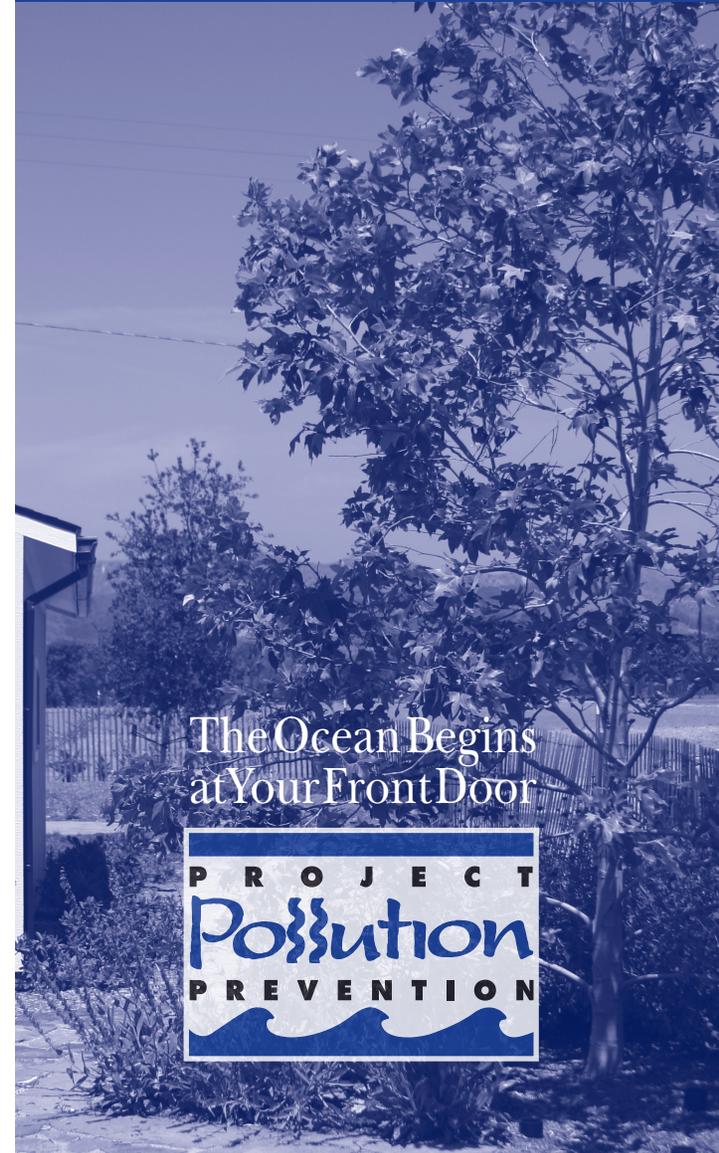
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Help Prevent Ocean Pollution:

Responsible Pest Control



The Ocean Begins
at Your Front Door



Tips for Pest Control

Key Steps to Follow:

Step 1: Correctly identify the pest (insect, weed, rodent, or disease) and verify that it is actually causing the problem.



This is important because beneficial insects are often mistaken for pests and sprayed with pesticides needlessly.

Consult with a Certified Nursery Professional at a local nursery or garden center or send a sample of the pest to the Orange County Agricultural Commissioner's Office.

Determine if the pest is still present – even though you see damage, the pest may have left.

Step 2: Determine how many pests are present and causing damage.



Small pest populations may be controlled more safely using non-pesticide techniques. These include removing food sources, washing off leaves with a strong stream of water, blocking entry into the home using caulking and replacing problem plants with ones less susceptible to pests.

Integrated Pest Management (IPM) usually combines several least toxic pest control methods for long-term prevention and management of pest problems without harming you, your family, or the environment.



Step 3: If a pesticide must be used, choose the least toxic chemical.

Obtain information on the least toxic pesticides that are effective at controlling the target pest from the UC Statewide Integrated Pest Management (IPM) Program's Web site at www.ipm.ucdavis.edu.

Seek out the assistance of a Certified Nursery Professional at a local nursery or garden center when selecting a pesticide. Purchase the smallest amount of pesticide available.

Apply the pesticide to the pest during its most vulnerable life stage. This information can be found on the pesticide label.

Step 4: Wear appropriate protective clothing.

Follow pesticide labels regarding specific types of protective equipment you should wear. Protective clothing should always be washed separately from other clothing.

Step 5: Continuously monitor external conditions when applying pesticides such as weather, irrigation, and the presence of children and animals.

Never apply pesticides when rain is predicted within the next 48 hours. Also, do not water after applying pesticides unless the directions say it is necessary.

Apply pesticides when the air is still; breezy conditions may cause the spray or dust to drift away from your targeted area.

In case of an emergency call 911 and/or the regional poison control number at (714) 634-5988 or (800) 544-4404 (CA only).

For general questions you may also visit www.calpoison.org.

Step 6: In the event of accidental spills, sweep up or use an absorbent agent to remove any excess pesticides. Avoid the use of water.

Be prepared. Have a broom, dust pan, or dry absorbent material, such as cat litter, newspapers or paper towels, ready to assist in cleaning up spills.

Contain and clean up the spill right away. Place contaminated materials in a doubled plastic bag. All materials used to clean up the spill should be properly disposed of according to your local Household Hazardous Waste Disposal site.

Step 7: Properly store and dispose of unused pesticides.

Purchase Ready-To-Use (RTU) products to avoid storing large concentrated quantities of pesticides.



Store unused chemicals in a locked cabinet.

Unused pesticide chemicals may be disposed of at a Household Hazardous Waste Collection Center.

Empty pesticide containers should be triple rinsed prior to disposing of them in the trash.

Household Hazardous Waste
Collection Center
(714) 834-6752
www.oilandfills.com





Clean beaches and healthy creeks, rivers, bays and ocean are important to Orange County. However, many common activities can lead to water pollution if you're not careful. Home improvement projects and work sites must be maintained to ensure that building materials do not enter the street, gutter or storm drain. Unlike water in sanitary sewers (from sinks and toilets), water in storm drains is not treated before entering our waterways.

You would never dump building materials into the ocean, so don't let them enter the storm drains. Follow these tips to help prevent water pollution.

For more information,
please call the
Orange County Stormwater Program
at **1-877-89-SPILL** (1-877-897-7455)
or visit
www.ocwatersheds.com

To report a spill,
call the
**Orange County 24-Hour
Water Pollution Problem
Reporting Hotline**
at **1-877-89-SPILL** (1-877-897-7455).

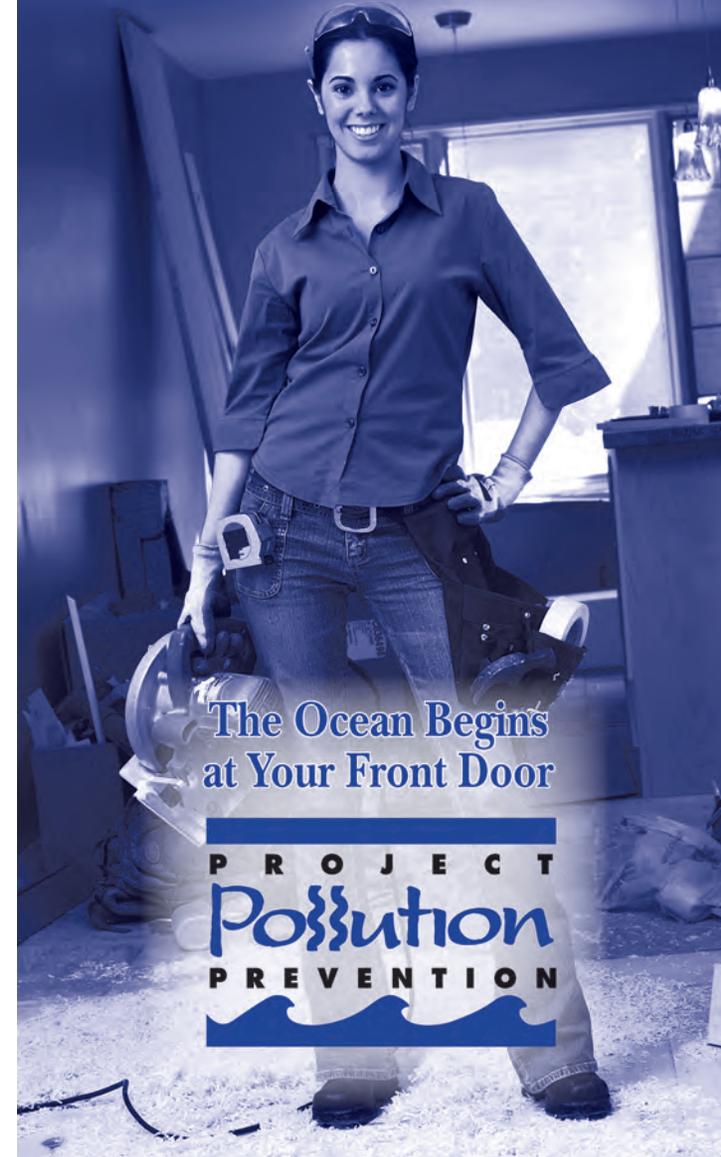
For emergencies, dial 911.

The tips contained in this brochure provide useful information to help prevent water pollution while performing home improvement projects. If you have other suggestions, please contact your city's stormwater representatives or call the Orange County Stormwater Program.



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Help Prevent Ocean Pollution: Tips for Home Improvement Projects



**The Ocean Begins
at Your Front Door**

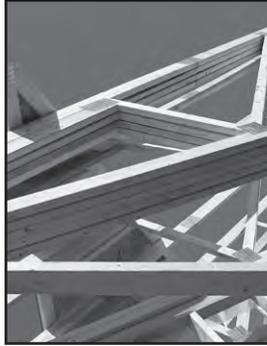
**PROJECT
Pollution
PREVENTION**

Tips for Home Improvement Projects

Home improvement projects can cause significant damage to the environment. Whether you hire a contractor or work on the house yourself, it is important to follow these simple tips while renovating, remodeling or improving your home:

General Construction

- Schedule projects for dry weather.
- Keep all construction debris away from the street, gutter and storm drain.
- Store materials under cover with temporary roofs or plastic sheets to eliminate or reduce the possibility that rainfall, runoff or wind will carry materials from the project site to the street, storm drain or adjacent properties.

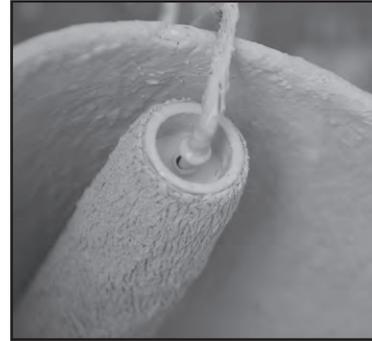


Building Materials

- Never hose materials into a street, gutter or storm drain.
- Exposed piles of construction material should not be stored on the street or sidewalk.
- Minimize waste by ordering only the amount of materials needed to complete the job.
- Do not mix more fresh concrete than is needed for each project.
- Wash concrete mixers and equipment in a designated washout area where the water can flow into a containment area or onto dirt.
- Dispose of small amounts of dry excess materials in the trash. Powdery waste, such as dry concrete, must be properly contained within a box or bag prior to disposal. Call your local trash hauler for weight and size limits.

Paint

- Measure the room or object to be painted, then buy only the amount needed.
- Place the lid on firmly and store the paint can upside-down in a dry location away from the elements.
- Tools such as brushes, buckets and rags should never be washed where excess water can drain into the street, gutter or storm drain. All tools should be rinsed in a sink connected to the sanitary sewer.
- When disposing of paint, never put wet paint in the trash.
- Dispose of water-based paint by removing the lid and letting it dry in the can. Large amounts must be taken to a Household Hazardous Waste Collection Center (HHWCC).
- Oil-based paint is a household hazardous waste. All leftover paint should be taken to a HHWCC.
- For HHWCC locations and hours, call (714) 834-6752 or visit www.oilandfills.com.



Erosion Control

- Schedule grading and excavation projects for dry weather.
- When temporarily removing soil, pile it in a contained, covered area where it cannot spill into the street, or obtain the required temporary encroachment or street closure permit and follow the conditions instructed by the permit.

- When permanently removing large quantities of soil, a disposal location must be found prior to excavation. Numerous businesses are available to handle disposal needs. For disposal options, visit www.ciwmb.ca.gov/SWIS.
- Prevent erosion by planting fast-growing annual and perennial grasses. They will shield and bind the soil.

Recycle

- Use a construction and demolition recycling company to recycle lumber, paper, cardboard, metals, masonry (bricks, concrete, etc.), carpet, plastic, pipes (plastic, metal and clay), drywall, rocks, dirt and green waste.
- For a listing of construction and demolition recycling locations in your area, visit www.ciwmb.ca.gov/recycle.



Spills

- Clean up spills immediately by using an absorbent material such as cat litter, then sweep it up and dispose of it in the trash.
- Immediately report spills that have entered the street, gutter or storm drain to the County's 24-Hour Water Pollution Problem Reporting Hotline at (714) 567-6363 or visit www.ocwatersheds.com to fill out an incident reporting form.

Sewage Spill Regulatory Requirements

Allowing sewage to discharge to a gutter or storm drain may subject you to penalties and/or out-of-pocket costs to reimburse cities or public agencies for clean-up efforts.

Here are the pertinent codes, fines, and agency contact information that apply.

Orange County Stormwater Program

24 Hour Water Pollution Reporting Hotline

1-877-89-SPILL (1-877-897-7455)

- County and city water quality ordinances prohibit discharges containing pollutants.

Orange County Health Care Agency Environmental Health

(714) 433-6419

California Health and Safety Code, Sections 5410-5416

- No person shall discharge raw or treated sewage or other waste in a manner that results in contamination, pollution or a nuisance.
- Any person who causes or permits a sewage discharge to any state waters:
 - must immediately notify the local health agency of the discharge.
 - shall reimburse the local health agency for services that protect the public's health and safety (water-contact receiving waters).
 - who fails to provide the required notice to the local health agency is guilty of a misdemeanor and shall be punished by a fine (between \$500-\$1,000) and/or imprisonment for less than one year.

Regional Water Quality Control Board Santa Ana Region San Diego Region

(951) 782-4130

(858) 467-2952

- Requires the prevention, mitigation, response to and reporting of sewage spills.

California Office of Emergency Services

(800) 852-7550

California Water Code, Article 4, Chapter 4, Sections 13268-13271
California Code of Regulations, Title 23, Division 3, Chapter 9.2, Article 2, Sections 2250-2260

- Any person who causes or permits sewage in excess of 1,000 gallons to be discharged to state waters shall immediately notify the Office of Emergency Services.
- Any person who fails to provide the notice required by this section is guilty of a misdemeanor and shall be punished by a fine (less than \$20,000) and/or imprisonment for not more than one year.

Sewage Spill Reference Guide

Your Responsibilities as a Private Property Owner

Residences
Businesses
Homeowner/Condominium Associations
Federal and State Complexes
Military Facilities



Orange County
Sanitation District



Health Care Agency
Environmental Health



www.ocwatersheds.com

This brochure was designed courtesy of the Orange County Sanitation District (OCS D).
For additional information, call (714) 962-2411, or visit their website at www.ocsd.com

What is a Sewage Spill?

Sewage spills occur when the wastewater being transported via underground pipes overflows through a manhole, cleanout or broken pipe. Sewage spills can cause health hazards, damage to homes and businesses, and threaten the environment, local waterways and beaches.

Common Causes of Sewage Spills

Grease builds up inside and eventually blocks sewer pipes. Grease gets into the sewer from food establishments, household drains, as well as from poorly maintained commercial grease traps and interceptors.

Structure problems caused by tree roots in the lines, broken/cracked pipes, missing or broken cleanout caps or undersized sewers can cause blockages.

Infiltration and inflow (I/I) impacts pipe capacity and is caused when groundwater or rainwater enters the sewer system through pipe defects and illegal connections.

You Are Responsible for a Sewage Spill Caused by a Blockage or Break in Your Sewer Lines!

Time is of the essence in dealing with sewage spills. You are required to **immediately**:

Control and minimize the spill. Keep spills contained on private property and out of gutters, storm drains and public waterways by shutting off or not using the water.

Use sandbags, dirt and/or plastic sheeting to prevent sewage from entering the storm drain system.

Clear the sewer blockage. Always wear gloves and wash your hands. It is recommended that a plumbing professional be called for clearing blockages and making necessary repairs.

Always notify your city sewer/public works department or public sewer district of sewage spills. If the spill enters the storm drains also notify the Health Care Agency. In addition, if it exceeds 1,000 gallons notify the Office of Emergency Services. Refer to the numbers listed in this brochure.

Overflowing
cleanout pipe
located on
private property



You Could Be Liable

Allowing sewage from your home, business or property to discharge to a gutter or storm drain may subject you to penalties and/or out-of-pocket costs to reimburse cities or public agencies for clean-up and enforcement efforts. See Regulatory Codes & Fines section for pertinent codes and fines that apply.

What to Look For

Sewage spills can be a very noticeable gushing of water from a manhole or a slow water leak that may take time to be noticed. Don't dismiss unaccounted-for wet areas.

Look for:

- Drain backups inside the building.
- Wet ground and water leaking around manhole lids onto your street.
- Leaking water from cleanouts or outside drains.
- Unusual odorous wet areas: sidewalks, external walls or ground/landscape around a building.

Caution

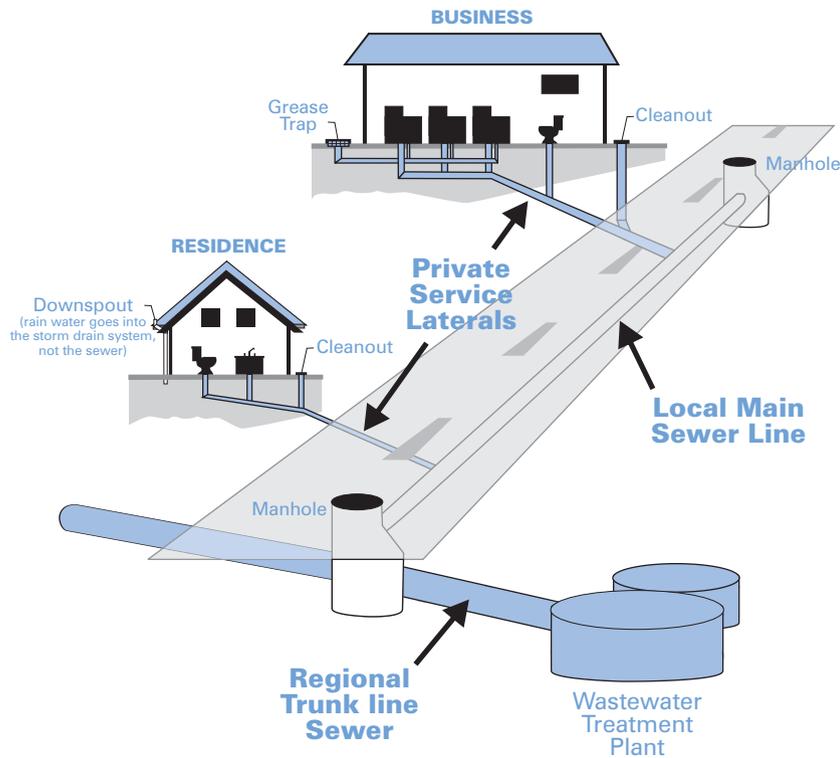
Keep people and pets away from the affected area. Untreated sewage has high levels of disease-causing viruses and bacteria. Call your local health care agency listed on the back for more information.

**If You See a Sewage Spill Occurring,
Notify Your City Sewer/Public Works
Department or Public Sewer District
IMMEDIATELY!**

How a Sewer System Works

A property owner's sewer pipes are called service laterals and are connected to larger local main and regional trunk lines. Service laterals run from the connection at the home to the connection with the public sewer (including the area under the street). These laterals are the responsibility of the property owner and must be maintained by the property owner. Many city agencies have adopted ordinances requiring maintenance of service laterals. Check with your city sewer/local public works department for more information.

Operation and maintenance of **local and regional sewer lines** are the responsibility of the city sewer/public works departments and public sewer districts.



Preventing Grease Blockages

The drain is not a dump! Recycle or dispose of grease properly and never pour grease down the drain.

Homeowners should mix fats, oils and grease with absorbent waste materials such as paper, coffee grounds, or kitty litter and place it in the trash. Wipe food scraps from plates and pans and dump them in the trash.

Restaurants and commercial food service establishments should always use "Kitchen Best Management Practices." These include:

- Collecting all cooking grease and liquid oil from pots, pans and fryers in covered grease containers for recycling.
- Scraping or dry-wiping excess food and grease from dishes, pots, pans and fryers into the trash.
- Installing drain screens on all kitchen drains.
- Having spill kits readily available for cleaning up spills.
- Properly maintaining grease traps or interceptors by having them serviced regularly. Check your local city codes.

How You Can Prevent Sewage Spills

- 1 Never put grease down garbage disposals, drains or toilets.**
- 2 Perform periodic cleaning to eliminate grease, debris and roots in your service laterals.**
- 3 Repair any structural problems in your sewer system and eliminate any rainwater infiltration/inflow leaks into your service laterals.**



Orange County Agency Responsibilities

- **City Sewer/Public Works Departments**— Responsible for protecting city property and streets, the local storm drain system, sewage collection system and other public areas.
- **Public Sewer/Sanitation District**— Responsible for collecting, treating and disposing of wastewater.
- **County of Orange Health Care Agency**— Responsible for protecting public health by closing ocean/bay waters and may close food-service businesses if a spill poses a threat to public health.
- **Regional Water Quality Control Boards**— Responsible for protecting State waters.
- **Orange County Stormwater Program**— Responsible for preventing harmful pollutants from being discharged or washed by stormwater runoff into the municipal storm drain system, creeks, bays and the ocean.

You Could Be Liable for Not Protecting the Environment

Local and state agencies have legal jurisdiction and enforcement authority to ensure that sewage spills are remedied.

They may respond and assist with containment, relieving pipe blockages, and/or clean-up of the sewage spill, especially if the spill is flowing into storm drains or onto public property.

A property owner may be charged for costs incurred by these agencies responding to spills from private properties.



Report Sewage Spills!

City Sewer/Public Works Departments

Aliso Viejo	(949) 425-2500
Anaheim	(714) 765-6860
Brea	(714) 990-7691
Buena Park	(714) 562-3655
Costa Mesa	(949) 645-8400
Cypress	(714) 229-6760
Dana Point	(949) 248-3562
Fountain Valley	(714) 593-4600
Fullerton	(714) 738-6897
Garden Grove	(714) 741-5375
Huntington Beach	(714) 536-5921
Irvine	(949) 453-5300
Laguna Beach	(949) 497-0765
Laguna Hills	(949) 707-2650
Laguna Niguel	(949) 362-4337
Laguna Woods	(949) 639-0500
La Habra	(562) 905-9792
Lake Forest	(949) 461-3480
La Palma	(714) 690-3310
Los Alamitos	(562) 431-3538
Mission Viejo	(949) 831-2500
Newport Beach	(949) 644-3011
Orange	(714) 532-6480
Orange County	(714) 567-6363
Placentia	(714) 993-8245
Rancho Santa Margarita	(949) 635-1800
San Clemente	(949) 366-1553
San Juan Capistrano	(949) 443-6363
Santa Ana	(714) 647-3380
Seal Beach	(562) 431-2527
Stanton	(714) 379-9222
Tustin	(714) 962-2411
Villa Park	(714) 998-1500
Westminster	(714) 893-3553
Yorba Linda	(714) 961-7170

Public Sewer/Water Districts

Costa Mesa Sanitary District	(714) 393-4433/ (949) 645-8400
El Toro Water District	(949) 837-0660
Emerald Bay Service District	(949) 494-8571
Garden Grove Sanitary District	(714) 741-5375
Irvine Ranch Water District	(949) 453-5300
Los Alamitos/Rossmoor Sewer District	(562) 431-2223
Midway City Sanitary District (Westminster)	(714) 893-3553
Moulton Niguel Water District	(949) 831-2500
Orange County Sanitation District	(714) 962-2411
Santa Margarita Water District	(949) 459-6420
South Coast Water District	(949) 499-4555
South Orange County Wastewater Authority	(949) 234-5400
Sunset Beach Sanitary District	(562) 493-9932
Trabuco Canyon Sanitary District	(949) 858-0277
Yorba Linda Water District	(714) 777-3018

Other Agencies

Orange County Health Care Agency	(714) 433-6419
Office of Emergency Services	(800) 852-7550



Clean beaches and healthy creeks, rivers, bays and ocean are important to Orange County. However, many common activities can lead to water pollution if you're not careful. Fertilizers, pesticides and other chemicals that are left on yards or driveways can be blown or washed into storm drains that flow to the ocean. Overwatering lawns can also send materials into storm drains. Unlike water in sanitary sewers (from sinks and toilets), water in storm drains is not treated before entering our waterways.

You would never pour gardening products into the ocean, so don't let them enter the storm drains. Follow these easy tips to help prevent water pollution.

For more information, please call the **Orange County Stormwater Program** at **1-877-89-SPILL** (1-877-897-7455) or visit www.ocwatersheds.com

UCCE Master Gardener Hotline:
(714) 708-1646

To report a spill, call the **Orange County 24-Hour Water Pollution Problem Reporting Hotline** **1-877-89-SPILL** (1-877-897-7455).

For emergencies, dial 911.

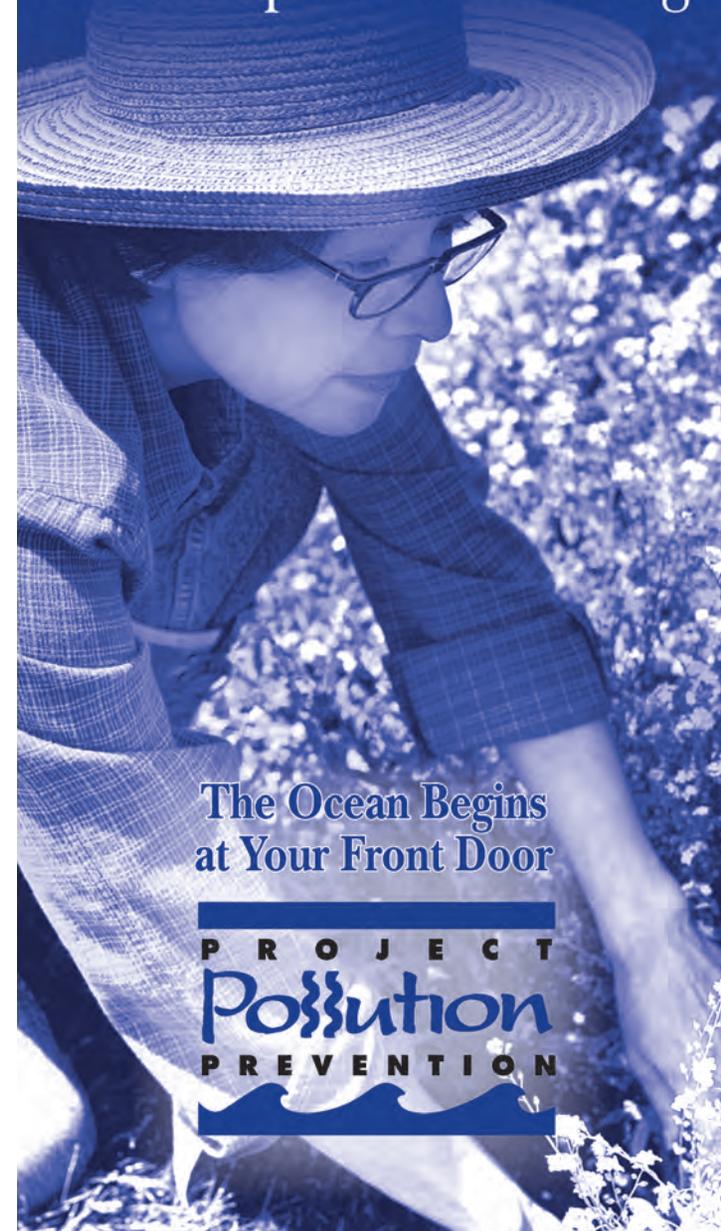
The tips contained in this brochure provide useful information to help prevent water pollution while landscaping or gardening. If you have other suggestions, please contact your city's stormwater representatives or call the Orange County Stormwater Program.



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Help Prevent Ocean Pollution:

Tips for Landscape & Gardening



The Ocean Begins
at Your Front Door



Tips for Landscape & Gardening

Never allow gardening products or polluted water to enter the street, gutter or storm drain.

General Landscaping Tips

- Protect stockpiles and materials from wind and rain by storing them under tarps or secured plastic sheeting.
- Prevent erosion of slopes by planting fast-growing, dense ground covering plants. These will shield and bind the soil.
- Plant native vegetation to reduce the amount of water, fertilizers, and pesticide applied to the landscape.
- Never apply pesticides or fertilizers when rain is predicted within the next 48 hours.



Garden & Lawn Maintenance

- Do not overwater. Use irrigation practices such as drip irrigation, soaker hoses or micro spray systems. Periodically inspect and fix leaks and misdirected sprinklers.

- Do not rake or blow leaves, clippings or pruning waste into the street, gutter or storm drain. Instead, dispose of green waste by composting, hauling it to a permitted landfill, or recycling it through your city's program.



- Use slow-release fertilizers to minimize leaching, and use organic fertilizers.
- Read labels and use only as directed. Do not over-apply pesticides or fertilizers. Apply to spots as needed, rather than blanketing an entire area.
- Store pesticides, fertilizers and other chemicals in a dry covered area to prevent exposure that may result in the deterioration of containers and packaging.



- Rinse empty pesticide containers and re-use rinse water as you would use the

product. Do not dump rinse water down storm drains. Dispose of empty containers in the trash.

- When available, use non-toxic alternatives to traditional pesticides, and use pesticides specifically designed to control the pest you are targeting. For more information, visit www.ipm.ucdavis.edu.
- If fertilizer is spilled, sweep up the spill before irrigating. If the spill is liquid, apply an absorbent material such as cat litter, and then sweep it up and dispose of it in the trash.
- Take unwanted pesticides to a Household Hazardous Waste Collection Center to be recycled. Locations are provided below.

Household Hazardous Waste Collection Centers

Anaheim:	1071 N. Blue Gum St.
Huntington Beach:	17121 Nichols St.
Irvine:	6411 Oak Canyon
San Juan Capistrano:	32250 La Pata Ave.

For more information, call (714) 834-6752 or visit www.oilandfills.com



Clean beaches and healthy creeks, rivers, bays and ocean are important to Orange County. However, many common activities can lead to water pollution if you're not careful. Pet waste and pet care products can be washed into the storm drains that flow to the ocean. Unlike water in sanitary sewers (from sinks and toilets), water in storm drains is not treated before entering our waterways.

You would never put pet waste or pet care products into the ocean, so don't let them enter the storm drains. Follow these easy tips to help prevent water pollution.

For more information, please call the **Orange County Stormwater Program** at **1-877-89-SPILL** (1-877-897-7455) or visit **www.ocwatersheds.com**

To report a spill, call the **Orange County 24-Hour Water Pollution Problem Reporting Hotline** **1-877-89-SPILL** (1-877-897-7455).

For emergencies, dial 911.

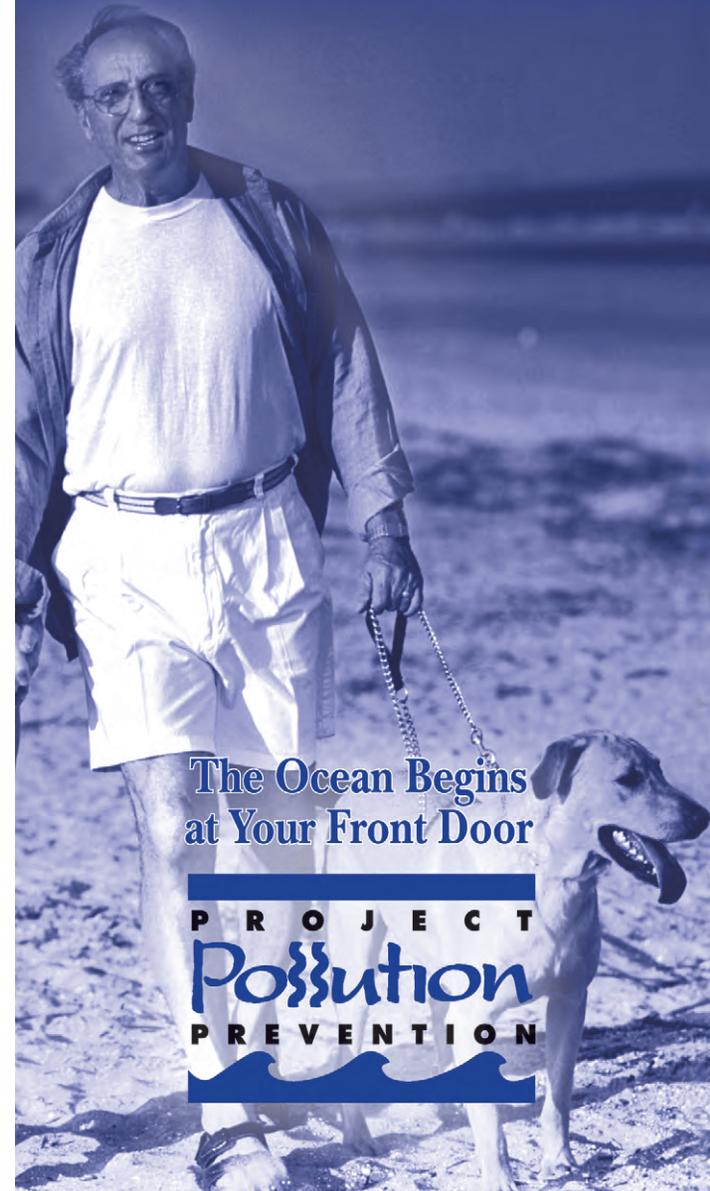
The tips contained in this brochure provide useful information to help prevent water pollution while caring for your pet. If you have other suggestions, please contact your city's stormwater representatives or call the Orange County Stormwater Program.



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Help Prevent Ocean Pollution:

Tips for Pet Care



The Ocean Begins
at Your Front Door

P R O J E C T
Pollution
P R E V E N T I O N

Tips for Pet Care

Never let any pet care products or washwater run off your yard and into the street, gutter or storm drain.

Washing Your Pets

Even biodegradable soaps and shampoos can be harmful to marine life and the environment.

- If possible, bathe your pets indoors using less-toxic shampoos or have your pet professionally groomed. Follow instructions on the products and clean up spills.
- If you bathe your pet outside, wash it on your lawn or another absorbent/permeable surface to keep the washwater from running into the street, gutter or storm drain.



Flea Control

- Consider using oral or topical flea control products.
- If you use flea control products such as shampoos, sprays or collars, make sure to dispose of any unused products at a Household Hazardous Waste Collection Center. For location information, call (714) 834-6752.



Why You Should Pick Up After Your Pet

It's the law! Every city has an ordinance requiring you to pick up after your pet. Besides being a nuisance, pet



waste can lead to water pollution, even if you live inland. During rainfall, pet waste left outdoors can wash into storm drains. This waste flows directly into our waterways and the ocean where it can harm human health, marine life and the environment.

As it decomposes, pet waste demands a high level of oxygen from water. This decomposition can contribute to killing marine life by reducing the amount of dissolved oxygen available to them.

Have fun with your pets, but please be a responsible pet owner by taking care of them and the environment.

- Take a bag with you on walks to pick up after your pet.
- Dispose of the waste in the trash or in a toilet.





Clean beaches and healthy creeks, rivers, bays and ocean are important to Orange County. However, many common activities such as painting can lead to water pollution if you're not careful. Paint must be used, stored and disposed of properly to ensure that it does not enter the street, gutter or storm drain. Unlike water in sanitary sewers (from sinks and toilets), water in storm drains is not treated before entering our waterways.

You would never dump paint into the ocean, so don't let it enter the storm drains. Follow these easy tips to help prevent water pollution.

For more information, please call the **Orange County Stormwater Program** at **1-877-89-SPILL** (1-877-897-7455) or visit www.ocwatersheds.com

To report a spill, call the **Orange County 24-Hour Water Pollution Problem Reporting Hotline** at **1-877-89-SPILL** (1-877-897-7455).

For emergencies, dial 911.

The tips contained in this brochure provide useful information to help prevent water pollution while using, storing and disposing of paint. If you have other suggestions, please contact your city's stormwater representatives or call the Orange County Stormwater Program.



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Help Prevent Ocean Pollution:

Tips for Projects Using Paint



Tips for Projects Using Paint

Paint can cause significant damage to our environment. Whether you hire a contractor or do it yourself, it is important to follow these simple tips when purchasing, using, cleaning, storing and disposing of paint.

Purchasing Paint

- Measure the room or object to be painted, then buy only the amount needed.
- Whenever possible, use water-based paint since it usually does not require hazardous solvents such as paint thinner for cleanup.

Painting

- Use only one brush or roller per color of paint to reduce the amount of water needed for cleaning.
- Place open paint containers or trays on a stable surface and in a position that is unlikely to spill.
- Always use a tarp under the area or object being painted to collect paint drips and contain spills.

Cleaning

- Never clean brushes or rinse paint containers in the street, gutter or storm drain.
- For oil-based products, use as much of the paint on the brushes as possible. Clean brushes with thinner. To reuse thinner, pour it through a fine filter (e.g. nylon, metal gauze or filter paper) to remove solids such as leftover traces of paint.
- For water-based products, use as much of the paint on the brushes as possible, then rinse in the sink.
- Collect all paint chips and dust. Chips and dust from marine paints or paints containing lead, mercury or tributyl tin are hazardous waste. Sweep up and dispose of at a Household Hazardous Waste Collection Center (HHWCC).

Storing Paint

- Store paint in a dry location away from the elements.
- Store leftover water-based paint, oil-based paint and solvents separately in original or clearly marked containers.
- Avoid storing paint cans directly on cement floors. The bottom of the can will rust much faster on cement.
- Place the lid on firmly and store the paint can upside-down to prevent air from entering. This will keep the paint usable longer. Oil-based paint is usable for up to 15 years. Water-based paint remains usable for up to 10 years.

Alternatives to Disposal

- Use excess paint to apply another coat, for touch-ups, or to paint a closet, garage, basement or attic.
- Give extra paint to friends or family. Extra paint can also be donated to a local theatre group, low-income housing program or school.
- Take extra paint to an exchange program such as the “**Stop & Swap**” that allows you to drop off or pick up partially used home care products free of charge. “**Stop & Swap**” programs are available at most HHWCCs.
- For HHWCC locations and hours, call (714) 834-6752 or visit www.oilandfills.com.



Disposing of Paint

- Never put wet paint in the trash.

For water-based paint:

- If possible, brush the leftover paint on cardboard or newspaper. Otherwise, allow the paint to dry in the can with the lid off in a well-ventilated area protected from the elements, children and pets. Stirring the paint every few days will speed up the drying.
- Large quantities of extra paint should be taken to a HHWCC.
- Once dried, paint and painted surfaces may be disposed of in the trash. When setting a dried paint can out for trash collection, leave the lid off so the collector will see that the paint has dried.

For oil-based paint:

- Oil-based paint is a household hazardous waste. All leftover paint should be taken to a HHWCC.

Aerosol paint:

- Dispose of aerosol paint cans at a HHWCC.

Spills

- Never hose down pavement or other impermeable surfaces where paint has spilled.
- Clean up spills immediately by using an absorbent material such as cat litter. Cat litter used to clean water-based paint spills can be disposed of in the trash. When cleaning oil-based paint spills with cat litter, it must be taken to a HHWCC.
- Immediately report spills that have entered the street, gutter or storm drain to the County's 24-Hour Water Pollution Problem Reporting Hotline at (714) 567-6363 or visit www.ocwatersheds.com to fill out an incident reporting form.



Water Quality Tips

There are many areas in your life where you can help to ensure the water quality within Orange County.

Agriculture Tips

- Manage animal waste to minimize contamination of surface water and ground water.
- Use planned grazing systems on pasture and rangeland.
- Dispose of pesticides, containers and tank rinsewater in an approved manner.

Automotive Tips

- Recycle used oil and antifreeze by taking them to service stations and other recycling centers.
- Never put used oil or other chemicals down stormdrains or in drainage ditches. (One quart of oil can contaminate up to two million gallons of drinking water!).
- Dispose of used oil, antifreeze, paints, and other household chemicals at your local household hazardous waste centers, not in storm sewers or drains.
- Clean up spilled brake fluid, oil, grease, and antifreeze by absorbing them using kitty litter or sand and then dispose of the material at a local household hazardous waste center. Do not hose them into the street where they can eventually reach local streams and lakes.
- Wash car engines at a "do it yourself car wash" where the drainage goes to the sewer, not the storm drain
- Wash your car on your lawn instead of your driveway.
- Drive only when necessary. Driving less reduces the amount of pollution your automobile generates. Automobiles emit tremendous amounts of airborne pollutants, which increase acid rain; they also deposit toxic metals and petroleum byproducts into the environment.
- Regular tune-ups and inspections can help keep automotive waste and byproducts from contaminating runoff.
- Wash your vehicle with soap products that are safe for the environment.

Chemicals & Cleaners Tips

- Take unwanted household toxic products to a hazardous waste disposal facility.
- Be aware that many chemicals commonly used around the home are toxic. Select less toxic alternatives. Use nontoxic substitutes wherever possible.
- Buy chemicals only in the amount you expect to use, and apply them only as directed. More is not better.
- Take unwanted household chemicals to hazardous waste collection centers; do not pour them down the drain. Pouring chemicals down the drain may disrupt your septic system or contaminate treatment plant sludge.
- Never pour unwanted chemicals on the ground. Soil cannot purify most chemicals, and they may eventually contaminate runoff.
- Use low-phosphate or phosphate-free detergents.
- Use water-based products whenever possible.
- Purchase one all-purpose cleaner instead of buying one product for every room.
- Buy household products such as cleaners and furniture polish labeled "non toxic".

Lawn & Garden Tips

Minimize grassed areas which require high maintenance.

Don't over water your lawn.

Use landscaping techniques such as grass swales (low areas in the lawn) or porous walkways to increase infiltration and decrease runoff.

Apply lawn and garden chemicals sparingly and according to directions.

When your lawn or garden needs watering, use slow-watering techniques such as trickle irrigation or soaker hoses. (Such devices reduce runoff and are 20-percent more effective than sprinklers.)

Leave lawn clippings on your lawn so that nutrients in the clippings are recycled and less yard waste goes to landfills.

If you elect to use a professional lawn care service, select a company that employs trained technicians and follows practices designed to minimize the use of fertilizers and pesticides.

Compost your yard trimmings. Compost is a valuable soil conditioner which gradually releases nutrients to your lawn and garden. (Using compost will also decrease the amount of fertilizer you need to apply.) In addition, compost retains moisture in the soil and thus helps you conserve water.

Spread mulch on bare ground to help prevent erosion and runoff.

Test your soil before applying fertilizers. Over fertilization is a common problem, and the excess can leach into ground water or contaminate rivers or lakes. Also, avoid using fertilizers near surface waters.

Use slow-release fertilizers on areas where the potential for water contamination is high, such as sandy soils, steep slopes, compacted soils, and verges of water bodies.

Select the proper season to apply fertilizers: Incorrect timing may encourage weeds or stress grasses.

Do not apply pesticides or fertilizers before or during rain due to the strong likelihood of runoff.

Calibrate your applicator before applying pesticides or fertilizers. As equipment ages, annual adjustments may be needed.

Keep storm gutters and drains clean of leaves and yard trimmings. (Decomposing vegetative matter leaches nutrients and can clog storm systems and result in flooding.)

Pet Tips

Keep litter, pet wastes, leaves, and debris out of street gutters and storm drains. These outlets drain directly to lakes, streams, rivers, and wetlands.

Pick up animal waste and dispose of in a trash can

Don't feed wild birds or animals near ponds, creeks, or the ocean

Clean up after your pets. Pet waste contains nutrients and pathogens that can contaminate surface water.

Paint & Solvents Tips

Don't let toxic liquids, such as oil, fuel, or paint, enter the storm drains.

Rinse paint brushes with water-based paint in the sink.

Use up all of your paint cleaners, solvents, and paints or share your leftovers with neighbors

Filter and reuse paint thinner or brush cleaners

Pesticides & Fertilizers Tips

Leftover household pesticide? Do not indiscriminately spray pesticides, either indoors or outdoors, where a pest problem has not been identified.

Dispose of excess pesticides at hazardous waste collection centers.

When landscaping your yard, select plants that have low requirements for water, fertilizers, and pesticides.

Cultivate plants that discourage pests.

Use pesticides, herbicides, and fertilizers in accordance with label instructions.

Don't overuse fertilizer in your yard.

Remodeling Choices Tips

Install wood decking or bricks or interlocking stones instead of impervious cement walkways.

Install gravel trenches along driveways or patios to collect water and allow it to filter into the ground.

Restore bare patches in your lawn as soon as possible to avoid erosion.
Grade all areas away from your house at a slope of one percent or more.
Repair leaking faucets, toilets, and pumps.

Soil Erosion Tips

Control erosion at landscape sites to prevent dirt and debris from entering storm drains
Divert rainspouts and garden hoses from paved surfaces onto grass to allow water to filter through the soil
Preserve existing trees, and plant trees and shrubs to help prevent erosion and promote infiltration of water into the soil.
Control soil erosion on your property by planting ground cover and stabilizing erosion-prone areas.
Reduce soil erosion by using conservation practices and other applicable Best Management Practices.
Encourage local government officials to develop construction erosion/sediment control ordinances in your community.

Septic Systems Tips

Improperly maintained septic systems can contaminate ground water and surface water with nutrients and pathogens.
By following the recommendations below, you can help ensure that your system continues to function properly.
Inspect your septic system annually.
Pump out your septic system regularly. (Pumping out every three to five years is recommended for a three-bedroom house with a 1,000-gallon tank; smaller tanks should be pumped more often.)
Do not use septic system additives. There is no scientific evidence that biological and chemical additives aid or accelerate decomposition in septic tanks; some additives may in fact be detrimental to the septic system or contaminate ground water.
Do not divert stormdrains or basement pumps into septic systems.
Avoid or reduce the use of your garbage disposal. (Garbage disposals contribute unnecessary solids to your septic system and can also increase the frequency your tank needs to be pumped.)
Don't use toilets as trash cans! Excess solids may clog your drainfield and necessitate more frequent pumping.
Homeowners can significantly reduce the volume of wastewater discharged to home septic systems and sewage treatment plants by conserving water. If you have a septic system, by decreasing your water usage, you can help prevent your system from overloading and contaminating ground water and surface water. (Seventy-five percent of drainfield failures are due to hydraulic overloading.)

Trash & Recycling Tips

Put cigarette butts in ash trays not in the street or storm drain.
Use a broom rather than a hose to clean driveways and sidewalks.
Use natural products or less toxic pesticides.
Don't litter! Throw trash in a trash can before leaving an area.
Recycle reusable materials.
Keep those old wireless phones out of landfills. Sprint's wireless division is asking consumers to donate previously used wireless phones at Sprint stores and participating Easter Seals locations. Through Sprint Project Connect, donated wireless phones will be either recycled or resold with 35 percent of the proceeds benefiting Easter Seals and the National Organization on Disability (N.O.D.) - two key organizations that serve people with disabilities. Older and obsolete models of wireless phones will be accepted but may have no value to the Wireless Foundation and thus may not generate funds for Easter Seals and the National Organization on Disability. However, these phones will be recycled in an environmentally sound manner. To learn more about Sprint Project Connect, please visit <http://www.sprintpcs.com>.

Water Conservation Tips

Use low-flow faucets, shower heads, reduced-flow toilet flushing equipment, and water saving appliances such as dish and clothes washers.
Repair leaking faucets, toilets, and pumps.

Use dishwashers and clothes washers only when fully loaded.

Take short showers instead of baths and avoid letting faucets run unnecessarily.

Wash your car only when necessary; use a bucket to save water. Alternatively, go to a commercial car wash that uses water efficiently and disposes of runoff properly.

Do not over-water your lawn or garden. Over-watering may increase leaching of fertilizers to ground water.

Protect drinking water by using less pesticides and fertilizers.

ENVIRONMENTAL CHALLENGE

YOUR SCORE

0 POINTS: SPOTLESS

Congratulations, your family, friends and neighbors are doing a great job keeping your environment pollutant-free.

5-50 POINTS: SPRINKLING OF POLLUTANTS

Your neighbors/schoolmates are working hard to keep your environment pollutant-free. Keep up the good work.

55-100 POINTS: SEVERAL POLLUTANTS

Your environment has too many pollutants. Help keep your environment pollutant free by doing your part.

105-150 POINTS: SCORES OF POLLUTANTS

With so many pollutants in your environment, consider teaming up with a friend or family member to educate your community about the simple ways they can keep your environment pollutant free.

155+ POINTS: SUBMERGED IN POLLUTANTS

Your environment has a significant amount of pollutants that may enter the storm drain and flow directly to the ocean. Consider working with adults in your area to organize a school/neighborhood clean-up event.

ENVIRONMENTAL CHALLENGE

Are you able to spot real pollutants? Search your yard, neighborhood or schoolyard for the following pollutants. Each item has a point value. Once your search is completed, add up your points and find out how polluted your environment is.

Animal waste	10 points
Bag.....	10 points
Candy wrapper	10 points
Cardboard.....	15 points
Cigarette	5 points
Cut grass	10 points
Dirt on the street.....	15 points
Fallen leaves.....	5 points
Fast food wrapper	10 points
Glass	20 points
Metal.....	15 points
Newspaper	10 points
Oil.....	15 points
Paper	5 points
Plastic bottle	10 points
Soapsuds.....	20 points
Soda can.....	5 points
Water in the gutter.....	10 points

YOU CAN HELP KEEP YOUR ENVIRONMENT POLLUTANT FREE BY:

- Not Littering
- Participate in a clean-up event.
- Recycling
- Picking up after your pet
- Do not overwater your lawn.
- Sweeping up trash, leaves and cut grass from your driveway, sidewalk or patio and putting it in the trash.
- Soaking up outdoor spills with towels or cat litter rather than rinsing them with water.
- Reminding your parents to check their cars for leaks.
- Never putting anything into the storm drain. Storm drains are only for rainwater.
- Teaching others how to protect the environment.

To learn more about protecting your environment from pollution visit www.ocwatersheds.com.
Pollution Prevention Hotline
1-877-89-SPILL / 1-877-897-7455



Help Prevent Ocean Pollution



Coloring and Activity Booklet

The Ocean Begins at Your Front Door

PROJECT
Pollution
PREVENTION

Environmental Encyclopedia

STORMWATER:

Water from nature such as rain or snow melt.

URBAN RUN-OFF:

Water from a hose or sprinkler that flows into the street.

POLLUTANT:

Materials such as litter, pet waste, motor oil and yard clippings that harm the environment.

STORM DRAIN:

An opening in the street where water from rain or urban run-off flows. This water picks up pollutants on the way to the storm drain. Once in the storm drain, the water and pollutants flow untreated to the ocean.

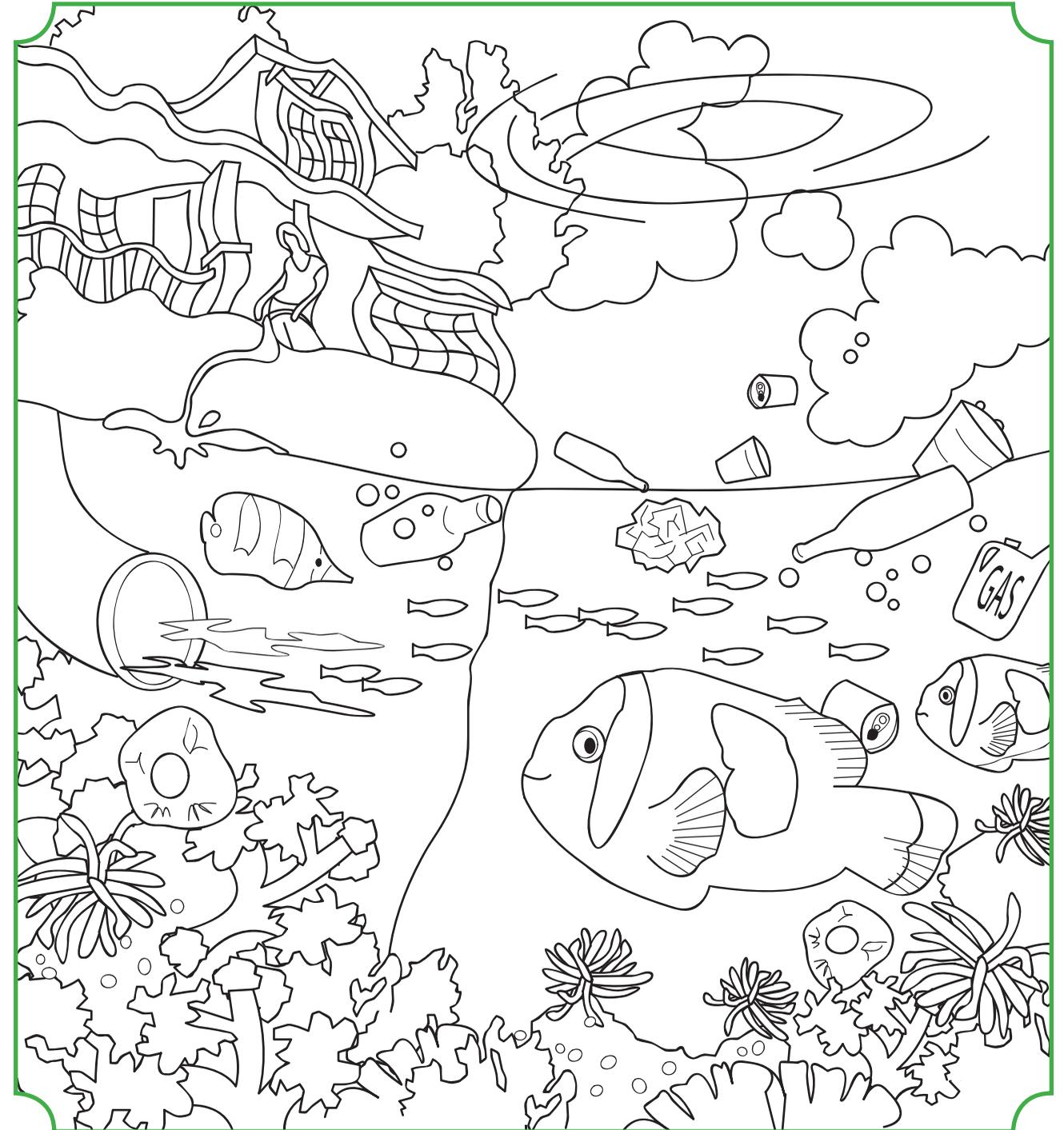
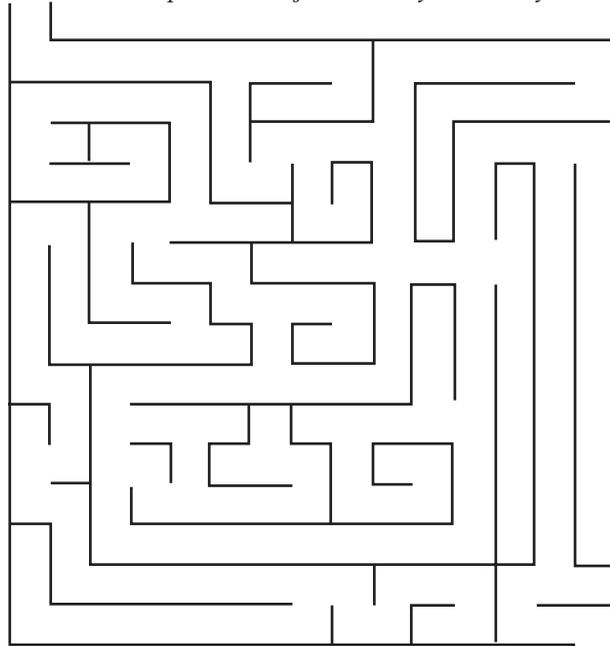
WHAT DOES NOT BELONG IN THE OCEAN?

When we throw trash on the ground, it can end up in the ocean. Put an 'X' on the things that DO NOT belong in the ocean and color the things that DO belong in the ocean.

MAZE:



Help the bottle find its way to the recycle bin!



A Fish EyeView of Pollution.

The Pollution Solution

Several residential activities can result in water pollution. Among these activities are car washing and hosing off driveways and sidewalks. Both activities can waste water and result in excess runoff. Water conservation methods described in this pamphlet can prevent considerable amounts of runoff and conserve water. By taking your car to a commercial car wash and by sweeping driveways and sidewalks, you can further prevent the transport of pollutants to Orange County waterways. Here are some of the common pollutants for which you can be part of the solution:

1 Pesticides and Fertilizer

- **Pollution:** The same pesticides that are designed to be toxic to pests can have an equally lethal impact on our marine life. The same fertilizer that promotes plant growth in lawns and gardens can also create nuisance algae blooms, which remove oxygen from the water and clog waterways when it decomposes.



- **Solution:** Never use pesticides or fertilizer within 48 hours of an anticipated rainstorm. Use only as much as is directed on the label and keep it off driveways and sidewalks.

2 Dirt and Sediment

- **Pollution:** Dirt or sediment can impede the flow of the stormwater and negatively impact stream habitat as it travels through waterways and deposits downstream. Pollutants can attach to sediment, which can then be transported through our waterways.

- **Solution:** Protect dirt stockpiles by covering them with tarps or secure plastic sheets to prevent wind or rain from allowing dirt or sediment to enter the storm drain system.

3 Metals

- **Pollution:** Metals and other toxins present in car wash water can harm important plankton, which forms the base of the aquatic food chain.

- **Solution:** Take your car to a commercial car wash where the wash water is captured and treated at a local wastewater treatment plant.

DID YOU KNOW?

Did you know that most of the pollution found in our waterways is not from a single source, but from a "non-point" source meaning the accumulation of pollution from residents and businesses throughout the community

4 Pet Waste

- **Pollution:** Pet waste carries bacteria through our watersheds and eventually will be washed out to the ocean. This can pose a health risk to swimmers and surfers.

- **Solution:** Pick up after your pets!

5 Trash and Debris

- **Pollution:** Trash and debris can enter waterways by wind, littering and careless maintenance of trash receptacles. Street sweeping collects some of this trash; however, much of what isn't captured ends up in our storm drain system where it flows untreated out to the ocean.



- **Solution:** Don't litter and make sure trash containers are properly covered. It is far more expensive to clean up the litter and trash that ends up in our waterways than it is to prevent it in the first place. Come out to one of Orange County's many locations for Coastal and Inner-Coastal Cleanup Day, which is held in September.

6 Motor Oil / Vehicle Fluids

- **Pollution:** Oil and petroleum products from our vehicles are toxic to people, wildlife and plants.

- **Solution:** Fix any leaks from your vehicle and keep the maintenance up on your car. Use absorbent material such as cat litter on oil spills, then sweep it up and dispose of it in the trash. Recycle used motor oil at a local Household Hazardous Waste Collection Center.



A TEAM EFFORT

The Orange County Stormwater Program has teamed with the Municipal Water District of Orange County (MWDOC) and the University of California Cooperative Extension Program (UCCE) to develop this pamphlet.

Low Impact Development (LID) and sustainable water use prevents water pollution and conserves water for drinking and reuse. Reducing your water use and the amount of water flowing from your home protects the environment and saves you money.

Thank you for making water protection a priority!

For more information, please visit www.ocwatersheds.com/publiced/

www.mwdoc.com

www.uccemg.com



To report a spill, call the Orange County 24-Hour Water Pollution Prevention Reporting Hotline at 1-877-89-SPILL \ (1-877-897-7455)

Special Thanks to

The City of Los Angeles Stormwater Program for the use of its artwork

The Metropolitan Water District of Southern California for the use of the California-Friendly Plant and Native Habitat photos



Homeowners Guide for Sustainable Water Use

Low Impact Development, Water Conservation & Pollution Prevention



The Ocean Begins at Your Front Door



RUNOFF, RAINWATER AND REUSE

Where Does Water Runoff Go?

Stormwater, or water from rainfall events, and runoff from outdoor water use such as sprinklers and hoses flows from homes directly into catch basins and the storm drain system. After entering the storm drain, the water flows untreated into streams, rivers, bays and ultimately the Pacific Ocean. Runoff can come from lawns, gardens, driveways, sidewalks and roofs. As it flows over hard, impervious surfaces, it picks up pollutants. Some pollutants carried by the water runoff include trash, pet waste, pesticides, fertilizer, motor oil and more.

Water Conservation

Pollution not only impairs the water quality for habitat and recreation, it can also reduce the water available for reuse. Runoff allowed to soak into the ground is cleaned as it percolates through the soil, replenishing depleted groundwater supplies. Groundwater provides at least 50% of the total water for drinking and other indoor household activities in north and central Orange County. When land is covered with roads, parking lots, homes, etc., there is less land to take in the water and more hard surfaces over which the water can flow.

In Orange County, 60-70% of water used by residents and businesses goes to irrigation and other outdoor uses. Reusing rainwater to irrigate our lawn not only reduces the impact of water pollution from runoff, but it also is a great way to conserve our precious water resources and replenish our groundwater basin.

What is Low Impact Development (LID)?

Low Impact Development (LID) is a method of development that seeks to maintain the natural hydrologic character of an area. LID provides a more sustainable and pollution-preventative approach to water management.

New water quality regulations require implementation of LID in larger new developments and encourage implementation of LID and other sustainable practices in existing residential areas. Implementing modifications to your lawn or garden can reduce pollution in our environment, conserve water and reduce your water bill.



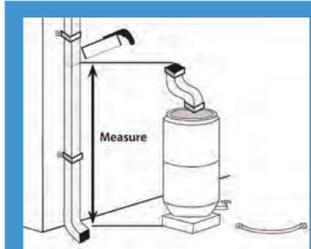
Permeable pavement allows water runoff to infiltrate through the soil and prevents most pollutants from reaching the storm drain system.

OPTIONS FOR RAINWATER HARVESTING AND REUSE

Rainwater harvesting is a great way to save money, prevent pollution and reduce potable water use. To harvest your rainwater, simply redirect the runoff from roofs and downspouts to rain barrels. Rain gardens are another option; these reduce runoff as well as encourage infiltration.

Downspout Disconnection/Redirection

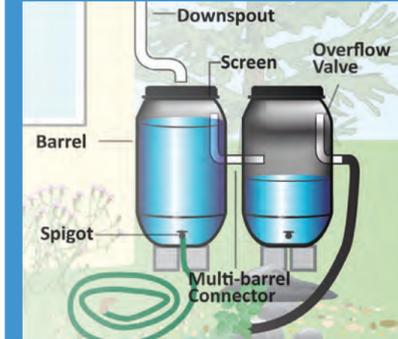
Disconnecting downspouts from pipes running to the gutter prevents runoff from transporting pollutants to the storm drain. Once disconnected, downspouts can be redirected to rain gardens or other vegetated areas, or be connected to a rain barrel.



Before modifying your yard to install a rain garden, please consult your local building and/or planning departments to ensure your garden plan follows pertinent building codes and ordinances. Besides codes and ordinances, some home owner associations also have guidelines for yard modifications. If your property is in hill areas or includes engineered slopes, please seek professional advice before proceeding with changes.

Rain Barrels

Rain barrels capture rainwater flow from roofs for reuse in landscape irrigation. Capacity of rain barrels needed for your home will depend on the amount of roof area and rainfall received. When purchasing your rain barrel, make sure it includes a screen, a spigot to siphon water for use, an overflow tube to allow for excess water to run out and a connector if you wish to connect multiple barrels to add capacity of water storage.



For information on how to disconnect a downspout or to install and maintain a rain barrel or rain garden at your home, please see the Los Angeles Rainwater Harvesting Program, A Homeowner's "How-To" Guide, November 2009 at www.larainwaterharvesting.org/



Mosquito growth prevention is very important when installing a rain barrel. The best way to prevent mosquito breeding is to eliminate entry points by ensuring all openings are sealed tightly. If these methods are unsuccessful, products are available to kill mosquito larvae, but that are harmless to animals and humans. Regular application of these products is essential. Please visit the Orange County Vector Control website for more information at www.ocvcd.org/mosquitoes3.php.



OTHER WATER CONSERVATION AND POLLUTION PREVENTION TECHNIQUES

Native Vegetation and Maintenance

"California Friendly" plants or native vegetation can significantly reduce water use. These plants often require far less fertilizers and pesticides, which are two significant pollutants found in Orange County waterways. Replacing water "thirsty" plants and grass types with water efficient natives is a great way to save water and reduce the need for potentially harmful pesticides and fertilizer.

Please see the California Friendly Garden Guide produced by the Metropolitan Water District of Southern California and associated Southern California Water Agencies for a catalog of California friendly plants and other garden resources at www.bewaterwise.com/Gardensoft.

Weed Free Yards

Weeds are water thieves. They often reproduce quickly and rob your yard of both water and nutrients. Weed your yard by hand if possible. If you use herbicides to control the weeds, use only the amount recommended on the label and never use it if rain is forecast within the next 48 hours.



Soil Amendments

Soil amendments such as green waste (e.g. grass clippings, compost, etc.) can be a significant source of nutrients and can help keep the soil near the roots of plants moist. However, they can cause algal booms if they get into our waterways, which reduces the amount of oxygen in the water and impacts most aquatic organisms. It is important to apply soil amendments more than 48 hours prior to predicted rainfall.

IRRIGATE EFFICIENTLY

Smart Irrigation Controllers

Smart Irrigation Controllers have internal clocks as well as sensors that will turn off the sprinklers in response to environmental changes. If it is raining, too windy or too cold, the smart irrigation control sprinklers will automatically shut off.

Check with your local water agency for available rebates on irrigation controllers and smart timers.

- Aim your sprinklers at your lawn, not the sidewalk – By simply adjusting the direction of your sprinklers you can save water, prevent water pollution from runoff, keep your lawn healthy and save money.
- Set a timer for your sprinklers – lawns absorb the water they need to stay healthy within a few minutes of turning on the sprinklers. Time your sprinklers; when water begins running off your lawn, you can turn them off. Your timer can be set to water your lawn for this duration every time.
- Water at Sunrise – Watering early in the morning will reduce water loss due to evaporation. Additionally, winds tend to die down in the early morning so the water will get to the lawn as intended.
- Water by hand – Instead of using sprinklers, consider watering your yard by hand. Hand-watering ensures that all plants get the proper amount of water and you will prevent any water runoff, which wastes water and carries pollutants into our waterways.
- Fix leaks - Nationwide, households waste one trillion gallons of water a year to leaks – that is enough water to serve the entire state of Texas for a year. If your garden hose is leaking, replace the nylon or rubber hose washer and ensure a tight connection. Fix broken sprinklers immediately.



Water runoff from sprinklers left on too long will carry pollutants into our waterways.



Clean beaches and healthy creeks, rivers, bays and ocean are important to Orange County. However, if we are not careful, our daily activities can lead directly to water pollution problems. Water that drains through your watershed can pick up pollutants which are then transported to our waterways and beautiful ocean.

You can prevent water pollution by taking personal action and by working with members of your watershed community to prevent urban runoff from entering your waterway.

For more information, please call the **Orange County Stormwater Program** at **1.877.89.SPILL** or visit www.ocwatersheds.com

To report a spill, call the **Orange County 24-Hour Water Pollution Problem Reporting Hotline** at **1.877.89.SPILL**.

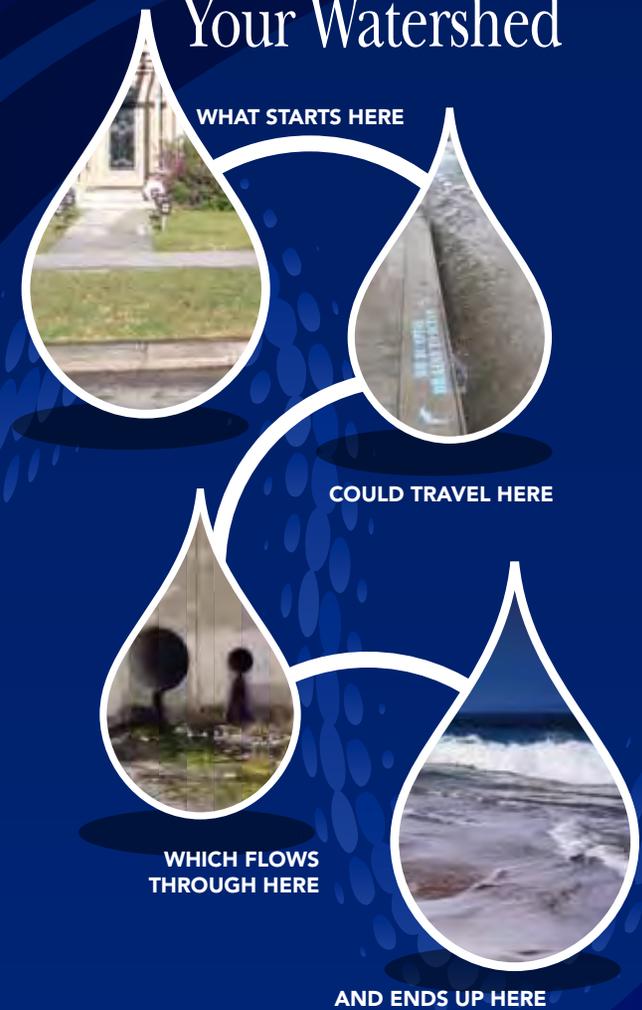
For emergencies, dial 911.

The tips contained in this brochure provide useful information to help protect your watershed. If you have other suggestions, please contact your city's stormwater representatives or call the Orange County Stormwater Program.



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Help Prevent Ocean Pollution: Tips For Protecting Your Watershed



The Ocean Begins
at Your Front Door



Tips for Protecting Your Watershed

My Watershed. Our Ocean.

Water + shed, noun: A region of land within which water flows down into a specified water body, such as a river, lake, sea, or ocean; a drainage basin or catchment basin.

Orange County is comprised of 11 major watersheds into which most of our water flows, connecting all of Orange County to the Pacific Ocean.



As water from rain (stormwater) or sprinklers and hoses (urban runoff) runs down your driveway and into your neighborhood streets, sidewalks

and gutters, it flows into storm drains that lead to waterways within your watershed. The waterways from other cities merge as they make their way through our watersheds until all the runoff water in Orange County meets at the Pacific Ocean. The water that reaches our ocean is not pure. As it flows through the watershed, it picks up pollutants such as litter, cigarette butts, fertilizer, pesticides, pet waste, motor oil and lawn clippings. Unlike water that enters the sewer (from sinks and toilets), water that enters the storm drain is not treated before it flows, ultimately, to the ocean.

Water quality can be improved by “Adopting Your Watershed.” Through this effort, we are challenging citizens and



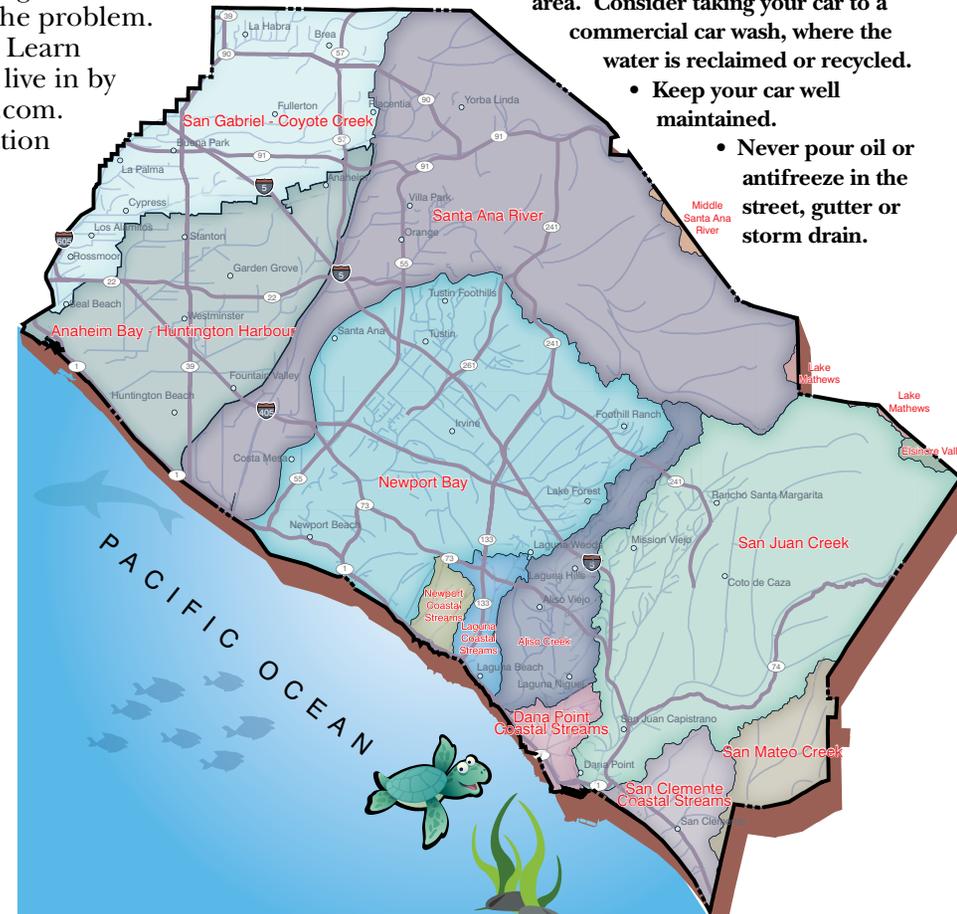
organizations to join the Orange County Stormwater Program and others who are working to protect and restore our creeks, rivers, bays and ocean.

There are many opportunities to get involved:

- Appreciate your watershed - explore the creeks, trails and ocean and make observations about its conditions. If you see anything abnormal (such as dead fish, oil spills, leaking barrels, and other pollution) contact the Orange County 24-hour water pollution problem reporting hotline at 1.877.89.SPILL to report the problem.
- Research your watershed. Learn about what watershed you live in by visiting www.ocwatersheds.com.
- Find a watershed organization in your community and volunteer to help. If there are no active groups, consider starting your own.
- Visit EPA’s Adopt Your Watershed’s Catalog of Watershed Groups at www.epa.gov/adopt to locate groups in your community.
- Organize or join in a creek, river, bay or ocean cleanup event such as Coastal & Inner Coastal Cleanup Day that takes place the 3rd Saturday of every September. For more information visit www.coast4u.org.

Follow these simple tips to protect the water quality of your watershed:

- Sweep up debris and dispose of it in the trash. Do not hose down driveways or sidewalks into the street or gutter.
- Use dry cleanup methods such as cat litter to absorb spills and sweep up residue.
- Set your irrigation systems to reflect seasonal water needs or use weather-based controllers. Inspect for runoff regularly.
- Cover trashcans securely.
- Take hazardous waste to a household hazardous waste collection center. (For example, paint, batteries and petroleum products)
- Pick up after your pet.
- Follow application and disposal directions for pesticides and fertilizers.
- If you wash your car at home, wash it on your lawn or divert the runoff onto a landscaped area. Consider taking your car to a commercial car wash, where the water is reclaimed or recycled.
 - Keep your car well maintained.
 - Never pour oil or antifreeze in the street, gutter or storm drain.



Help Prevent Ocean Pollution:

Tips for the Home Mechanic



Clean beaches and healthy creeks, rivers, bays and ocean are important to Orange County. However, not properly disposing of used oil is illegal and can lead to fines. If you pour or drain oil onto driveways, sidewalks or streets, it can be washed into the storm drain.

Help prevent water pollution by taking your used oil and oil filters to a used oil collection center. Most major automotive maintenance centers will accept up to five gallons of used motor oil at no cost. For a list of locations, please visit www.cleanup.org.



For more information, please call the **Orange County Stormwater Program** at **1-877-89-SPILL (1-877-897-7455)** or visit www.ocwatersheds.com.

For information about the proper disposal of household hazardous waste, call the **Household Waste Hotline** at **1-877-89-SPILL (1-877-897-7455)** or visit www.oilandfills.com.

For additional information about the nearest oil recycling center, call the **Used Oil Program** at **1-800-CLEANUP** or visit www.cleanup.org.



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The Ocean Begins at Your Front Door

Tips for the Home Mechanic

WORK SITE

- Locate the storm drains on or near your property. Do not allow used oil or any materials to flow into these drains.
- Examine your home for sources of pollution.
- Perform automotive projects under cover and in a controlled area to prevent stormwater runoff.
- Sweep or vacuum your automotive workspace regularly
- Use a damp mop to clean work areas. Never hose down surfaces into the street, gutter or storm drain.
- Pour mop water into a sink or toilet. Never dispose of water in a parking lot, street, gutter or storm drain.



PREVENT LEAKS AND SPILLS

- Keep absorbent materials such as rags and/or cat litter in the work area
- Empty drip pans into a labeled, seal container before they are full
- Wipe up any spills or repair leaks as they happen. Don't let them sit.
- Place large pans under any wrecked cars until all fluids are drained.
- Promptly dispose of collected fluids into a hazardous waste drum or deliver them to an oil recycling center. Used oil recycling locations can be found at <http://www.ochealthinfo.com/regulatory/usedoil.htm>

CLEANING SPILLS

- Clean up spills immediately by using absorbent material such as rags, cat litter or sand. If the material spilled is hazardous, dispose of the rag, litter or sand in the same manner as hazardous waste. If the material spill is non-hazardous, dispose of it in the trash.
- Immediately report spills that have entered the street, gutter or storm



- drain to the County's 24-Hour Water Pollution Problem Reporting Hotline at 1-877-89-SPILL (1-877-897-7455) or visit www.ocwatersheds.com to fill out an incident report.
- Report emergencies to 911.

VEHICLE FLUID MANAGEMENT

- Vehicle fluids are hazardous waste and must be stored and disposed of in accordance with all local, state and federal laws.
- Designate an area to drain vehicle fluids away from storm drains and sanitary drains.
- When possible, drain vehicle fluids indoors or within covered areas, and only over floors that are constructed of a non-porous material such as concrete. Asphalt and dirt floors absorb spilled or leaked fluids, making the cleanup extremely difficult.



Help Prevent Ocean Pollution:

Household Tips



The Ocean Begins at Your Front Door

PROJECT
Pollution
PREVENTION



Do your part to prevent water pollution in our creeks, rivers, bays and ocean.

Clean beaches and healthy creeks, rivers, bays, and ocean are important to Orange County. However, many common household activities can lead to water pollution if you're not careful.

Litter, oil, chemicals and other substances that are left on your yard or driveway can be blown or washed into storm drains that flow to the ocean. Over-watering your lawn and washing your car can also flush materials into the storm

REMEMBER THE
WATER IN YOUR
STORM DRAIN
IS NOT TREATED
BEFORE
IT ENTERS OUR
WATERWAYS

drains. Unlike water in sanitary sewers (from sinks and toilets), water in storm drains is not treated.

You would never pour soap, fertilizers or oil into the ocean, so don't let them enter streets, gutters or storm drains. Follow the easy tips in this brochure to help prevent water pollution.

For more information,
please call the
Orange County Stormwater Program
at **1-877-89-SPILL** (1-877-897-7455)
or visit
www.ocwatersheds.com

To report a spill,
call the
**Orange County 24-Hour
Water Pollution Problem
Reporting Hotline**
1-877-89-SPILL (1-877-897-7455).

For emergencies, dial 911.

The tips contained in this brochure provide useful information to help prevent water pollution while performing everyday household activities. If you have other suggestions, please contact your city's stormwater representatives or call the Orange County Stormwater Program.



Pollution Prevention

Household Activities

- **Do not rinse spills with water!** Sweep outdoor spills and dispose of in the trash. For wet spills like oil, apply cat litter or another absorbent material, then sweep and bring to a household hazardous waste collection center (HHWCC).
- Securely cover trash cans.
- Take household hazardous waste to a household hazardous waste collection center.
- Store household hazardous waste in closed, labeled containers inside or under a cover.
- Do not hose down your driveway, sidewalk or patio. Sweep up debris and dispose of in trash.
- Always pick up after your pet. Flush waste down the toilet or dispose of in the trash.
- Bathe pets indoors or have them professionally groomed.

Household Hazardous Wastes include:

- ▲ Batteries
- ▲ Paint thinners, paint strippers and removers
- ▲ Adhesives
- ▲ Drain openers
- ▲ Oven cleaners
- ▲ Wood and metal cleaners and polishes
- ▲ Herbicides and pesticides
- ▲ Fungicides/wood preservatives
- ▲ Automotive fluids and products
- ▲ Grease and rust solvents
- ▲ Thermometers and other products containing mercury
- ▲ Fluorescent lamps
- ▲ Cathode ray tubes, e.g. TVs, computer monitors
- ▲ Pool and spa chemicals

Gardening Activities

- Follow directions on pesticides and fertilizers, (measure, do not estimate amounts) and do not use if rain is predicted within 48 hours.
- Water your lawn and garden by hand to control the amount of water you use. Set irrigation systems to reflect seasonal water needs. If water flows off your yard and onto your driveway or sidewalk, your system is over-watering.
- Mulch clippings or leave them on the lawn. If necessary, dispose in a green waste container.
- Cultivate your garden often to control weeds.

Washing and Maintaining Your Car

- Take your car to a commercial car wash whenever possible.
- Choose soaps, cleaners, or detergents labeled “non-toxic,” “phosphate free” or “biodegradable.” Vegetable and citrus-based products are typically safest for the environment, **but even these should not be allowed into the storm drain.**
- Shake floor mats into a trash can or vacuum to clean.

- Do not use acid-based wheel cleaners and “hose off” engine degreasers at home. They can be used at a commercial facility, which can properly process the washwater.
- **Do not dump washwater onto your driveway, sidewalk, street, gutter or storm drain.** Excess washwater should be disposed of in the sanitary sewers (through a sink, or toilet) or onto an absorbent surface like your lawn.
- Use a nozzle to turn off water when not actively washing down automobile.
- Monitor vehicles for leaks and place pans under leaks. Keep your car well maintained to stop and prevent leaks.
- Use cat litter or other absorbents and sweep to remove any materials deposited by vehicles. Contain sweepings and dispose of at a HHWCC.
- Perform automobile repair and maintenance under a covered area and use drip pans or plastic sheeting to keep spills and waste material from reaching storm drains.
- **Never pour oil or antifreeze in the street, gutter or storm drains.** Recycle these substances at a service station, HHWCC, or used oil recycling center. For the nearest Used Oil Collection Center call 1-800-CLEANUP or visit www.ciwmb.ca.gov/UsedOil.

For locations and hours of Household Hazardous Waste Collection Centers in Anaheim, Huntington Beach, Irvine and San Juan Capistrano, call (714)834-6752 or visit www.oilandfills.com.



Do your part to prevent water pollution in our creeks, rivers, bays and ocean.

Clean beaches and healthy creeks, rivers, bays and ocean are important to Orange County. However, not properly disposing of household hazardous waste can lead to water pollution. Batteries, electronics, paint, oil, gardening chemicals, cleaners and other hazardous materials cannot be thrown in the trash. They also must never be poured or thrown into yards, sidewalks, driveways, gutters or streets. Rain or other water could wash the materials into the storm drain and eventually into our waterways and the ocean. In addition, hazardous waste must not be poured in the sanitary sewers (sinks and toilets).

***NEVER DISPOSE
OF HOUSEHOLD
HAZARDOUS
WASTE IN THE
TRASH, STREET,
GUTTER,
STORM DRAIN
OR SEWER.***

For more information,
please call the
Orange County Stormwater Program
at **1-877-89-SPILL** (1-877-897-7455)
or visit
www.ocwatersheds.com

**To Report Illegal Dumping of
Household Hazardous Waste
call 1-800-69-TOXIC**

To report a spill,
call the
**Orange County 24-Hour
Water Pollution Problem
Reporting Hotline**
1-877-89-SPILL (1-877-897-7455).

For emergencies, dial 911.



RECYCLE
USED OIL



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Help Prevent Ocean Pollution:

Proper Disposal of Household Hazardous Waste



**The Ocean Begins at
Your Front Door**

**P R O J E C T
Pollution
P R E V E N T I O N**

ORANGE COUNTY

Pollution Prevention

Leftover household products that contain corrosive, toxic, ignitable, or reactive ingredients are considered to be “household hazardous waste” or “HHW.” HHW can be found throughout your home, including the bathroom, kitchen, laundry room and garage.

*WHEN POSSIBLE,
USE
NON-HAZARDOUS
OR
LESS-HAZARDOUS
PRODUCTS.*

Disposal of HHW down the drain, on the ground, into storm drains, or in the trash is illegal and unsafe.

Proper disposal of HHW is actually easy. Simply drop them off at a Household Hazardous Waste Collection Center (HHWCC) for free disposal and recycling. Many materials including anti-freeze, latex-based paint, motor oil and batteries can be recycled. Some centers have a “Stop & Swap” program that lets you take partially used home, garden, and automobile products free of charge. There are four HHWCCs in Orange County:

Anaheim:.....1071 N. Blue Gum St
Huntington Beach: 17121 Nichols St
Irvine:..... 6411 Oak Canyon
San Juan Capistrano:.... 32250 La Pata Ave

Centers are open Tuesday-Saturday, 9 a.m.-3 p.m. Centers are closed on rainy days and major holidays. For more information, call (714) 834-6752 or visit www.oclandfills.com.

Common household hazardous wastes

- Batteries
- Paint and paint products
- Adhesives
- Drain openers
- Household cleaning products
- Wood and metal cleaners and polishes
- Pesticides
- Fungicides/wood preservatives
- Automotive products (antifreeze, motor oil, fluids)
- Grease and rust solvents
- Fluorescent lamps
- Mercury (thermometers & thermostats)
- All forms of electronic waste including computers and microwaves
- Pool & spa chemicals
- Cleaners
- Medications
- Propane (camping & BBQ)
- Mercury-containing lamps

- Television & monitors (CRTs, flatscreens)

Tips for household hazardous waste

- Never dispose of HHW in the trash, street, gutter, storm drain or sewer.
- Keep these materials in closed, labeled containers and store materials indoors or under a cover.
- When possible, use non-hazardous products.
- Reuse products whenever possible or share with family and friends.
- Purchase only as much of a product as you’ll need. Empty containers may be disposed of in the trash.
- HHW can be harmful to humans, pets and the environment. Report emergencies to 911.





Clean beaches and healthy creeks, rivers, bays, and ocean are important to Orange County. However, many common activities can lead to water pollution if you're not careful. Washwater, oil and residue from car washing should not flow into the street, gutter or storm drain. Unlike water in sanitary sewers (from sinks and toilets), water in storm drains is not treated before entering our waterways.

You would never dump soap, oil or dirty water into the ocean, so don't let it enter the storm drains. Follow these easy tips to help prevent water pollution.

For more information, please call the **Orange County Stormwater Program** at **1-877-89-SPILL (1-877-897-7455)** or visit www.ocwatersheds.com

To report a spill, call the **Orange County 24-Hour Water Pollution Problem Reporting Hotline** at **1-877-89-SPILL (1-877-897-7455)**

For emergencies, dial 911.

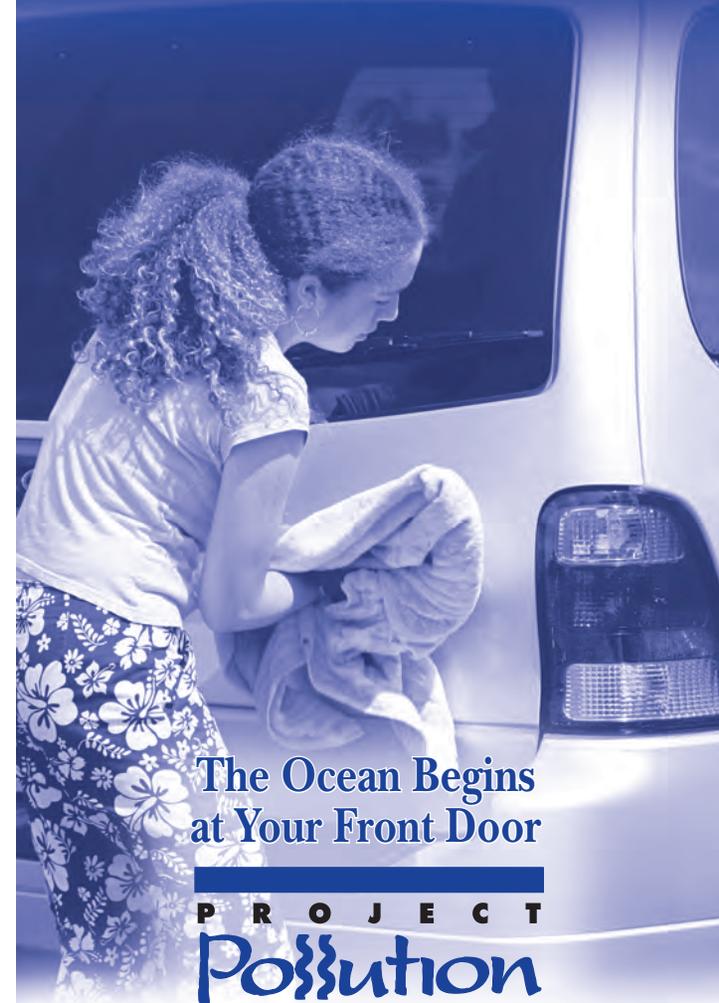
The tips contained in this brochure provide useful information about how you can keep soap, oil and washwater from car wash activities from entering the storm drain system. If you have other suggestions, please contact your city's stormwater representative or call the Orange County Stormwater Program.



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Help Prevent Ocean Pollution:

Tips for Car Wash Fund-Raisers



The Ocean Begins at Your Front Door

P R O J E C T
Pollution
P R E V E N T I O N

Tips for Car Wash Fund-Raisers

Before beginning your car wash fund-raiser

- Partner with a professional car wash and avoid the pollution that parking lot car washes can produce.



- Hold a meeting with all participants to explain the proper procedures that should be followed when washing cars.
- Remove all trash and debris from the car washing area.
- Select only soaps, cleaners or detergents labeled “non-toxic,” “phosphate-free,” or “biodegradable.” The safest products for the environment are vegetable-based or citrus-based soaps. However, even these soaps can be toxic for the environment, so never let any products enter the street, gutter or storm drain.
- Do not use acid based wheel cleaners or engine degreasers.

- Select a site where the washwater can soak into grass, gravel, or be diverted to nearby landscaping. This will allow the washwater to filter through the vegetation and/or soil instead of flowing directly into a storm drain.
- Divert the washwater to an area where the water can pool and evaporate throughout the day, or arrange to dispose of the washwater down a sanitary sewer drain. For details, refer to Factsheet *IC24 Wastewater Disposal Guidelines* located at www.ocwatersheds.com/StormWater/documents_bmp_existing_development.asp#res
- If there is a storm drain on-site, block it with sandbags. At the end of the day, dispose of the sandbags by dumping the contents in an authorized landscaped area.



During the fund-raiser

- Never let any trash or washwater enter the street, gutter or storm drain.
- Shake car mats in a trash can or vacuum them. Do not shake dirt from car mats directly onto the ground.
- Use a bucket of soapy water to re-soap rags or sponges throughout the day rather than adding soap directly to them.
- Wring sponges and washrags into buckets, not the ground.
- Conserve water by using a spray nozzle with an automatic shut-off. Turn off the water or kink the hose when not in use.
- Always empty buckets into the sanitary sewer system (e.g. sinks or toilets) or a landscaped area rather than pouring the water on concrete or asphalt.

After the fund-raiser

- Remember to clean up. Have a volunteer walk the perimeter of the site to pick up trash and debris and dispose of it properly.



Did you know that just one quart of oil can pollute 250,000 gallons of water?

A clean ocean and healthy creeks, rivers, bays and beaches are important to Orange County. However, not properly disposing of used oil can lead to water pollution. If you pour or drain oil onto driveways, sidewalks or streets, it can be washed into the storm drain. Unlike water in sanitary sewers (from sinks and toilets), water in storm drains is not treated before entering the ocean. Help prevent water pollution by taking your used oil to a used oil collection center.

Included in this brochure is a list of locations that will accept up to five gallons of used motor oil at no cost. Many also accept used oil filters. Please contact the facility before delivering your used oil. This listing of companies is for your reference and does not constitute a recommendation or endorsement of the company.

Please note that used oil filters may not be disposed of with regular household trash. They must be taken to a household hazardous waste collection or recycling center in Anaheim, Huntington Beach, Irvine or San Juan Capistrano. For information about these centers, visit www.oilandfills.com.

Please do not mix your oil with other substances!

For more information, please call the Orange County Stormwater Program at 1-877-89-SPILL (1-877-897-7455) or visit www.watersheds.com.

For information about the proper disposal of household hazardous waste, call the Household Waste Hotline at (714) 834-6752 or visit www.oilandfills.com.



For additional information about the nearest oil recycling center, call the Used Oil Program at 1-800-CLEANUP or visit www.cleanup.org.

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Help Prevent Ocean Pollution:

Recycle at Your Local Used Oil Collection Center



The Ocean Begins at Your Front Door



NORTH COUNTY

Used Oil Collection Centers

Anaheim

All Seasons Tire and Auto Center, Inc.
817 S Brookhurst St., Anaheim, CA 92804
(714)772-6090()
CIWMB#: 30-C-03177

AutoZone #3317
423 N Anaheim Blvd., Anaheim, CA 92805
(714)776-0787()
CIWMB#: 30-C-05263

AutoZone #5226
2145 W Lincoln Ave., Anaheim, CA 92801
(714)533-6599()
CIWMB#: 30-C-04604

Bedard Automotive
3601 E Miraloma Ave., Anaheim, CA 92806
(714)528-1380()
CIWMB#: 30-C-02205

Classic Chevrolet
1001 Weir Canyon Rd., Anaheim, CA 92807
(714)283-5400()
CIWMB#: 30-C-05223

Econo Lube N' Tune #4
3201 W Lincoln Ave., Anaheim, CA 92801
(714)821-0128()
CIWMB#: 30-C-01485

EZ Lube Inc - Savi Ranch #43
985 N Weir Canyon Rd., Anaheim, CA 92807
(714)556-1312()
CIWMB#: 30-C-06011

Firestone Store #71C7
1200 S Magnolia Ave., Anaheim, CA 92804
(949)598-5520()
CIWMB#: 30-C-05743

Great Western Lube Express
125 N Brookhurst St., Anaheim, CA 92801
(714)254-1300()
CIWMB#: 30-C-05542

HR Pro Auto Service Center
3180 W Lincoln Ave., Anaheim, CA 92801
(714)761-4343()
CIWMB#: 30-C-05927

Ira Newman Automotive Services
1507 N State College Blvd., Anaheim, CA 92806
(714)635-2392()
CIWMB#: 30-C-01482

Jiffy Lube #1028
2400 W Ball Rd., Anaheim, CA 92804
(714)761-5211()
CIWMB#: 30-C-00870

Jiffy Lube #1903
2505 E Lincoln Ave., Anaheim, CA 92806
(714)772-4000()
CIWMB#: 30-C-05511

Jiffy Lube #2340
2181 W Lincoln Ave., Anaheim, CA 92801
(714)533-1000()
CIWMB#: 30-C-04647

Kragen Auto Parts #1303
1088 N State College Blvd., Anaheim, CA 92806
(714)956-7351()
CIWMB#: 30-C-03438

Kragen Auto Parts #1399
2245 W Ball Rd., Anaheim, CA 92804
(714)490-1274()
CIWMB#: 30-C-04094

Kragen Auto Parts #1565
2072 Lincoln Ave., Anaheim, CA 92806
(714)502-6992()
CIWMB#: 30-C-04078

Kragen Auto Parts #1582
3420 W Lincoln Ave., Anaheim, CA 92801
(714)828-7977()
CIWMB#: 30-C-04103

Pep Boys #613
10912 Katella Ave., Anaheim, CA 92804
(714)638-0863()
CIWMB#: 30-C-01756

Pep Boys #663
3030 W Lincoln Anaheim, CA 92801
(714)826-4810()
CIWMB#: 30-C-03417

Pep Boys #809
8205 E Santa Ana Cyn Rd., Anaheim, CA 92808
(714)974-0105()
CIWMB#: 30-C-03443

Pick Your Part
1235 S Beach Blvd., Anaheim, CA 92804
(714)527-1645()
CIWMB#: 30-C-03744

PK Auto Performance
3106 W. Lincoln Ave., Anaheim, CA 92801
(714)826-2141()
CIWMB#: 30-C-05628

Quick Change Lube and Oil
2731 W Lincoln Ave., Anaheim, CA 92801
(714)821-4464()
CIWMB#: 30-C-04363

Saturn of Anaheim
1380 S Auto Center Dr., Anaheim, CA 92806
(714)648-2444()
CIWMB#: 30-C-06332

Sun Tech Auto Service
105 S State College Blvd., Anaheim, CA 92806
(714)956-1389()
CIWMB#: 30-C-06455

Uonic Truck Services
515 S Rose St., Anaheim, CA 92805
(714)533-3333()
CIWMB#: 30-C-01142

Anaheim Hills
Anaheim Hills Car Wash & Lube
5810 E La Palma Ave., Anaheim Hills, CA 92807
(714)777-6605()
CIWMB#: 30-C-01387

Brea
Firestone Store #27A9
891 E Imperial Hwy., Brea, CA 92821
(714)529-8404()
CIWMB#: 30-C-01221

Oil Can Henry's
230 N Brea Blvd., Brea, CA 92821
(714)990-1900()
CIWMB#: 30-C-04273

Buena Park
Firestone Store #71F7
6011 Orangetherpe Buena Park, CA 90620
(714)670-7912()
CIWMB#: 30-C-01218

Firestone Store #71T8
8600 Beach Blvd., Buena Park, CA 90620
(714)827-5300()
CIWMB#: 30-C-02121

Kragen Auto Parts #1204
5303 Beach Blvd., Buena Park, CA 90621
(714)994-1320()
CIWMB#: 30-C-02623

Cypress

AutoZone #5521
5471 Lincoln Ave., Cypress, CA 90630
(714)995-4644()
CIWMB#: 30-C-00836

Big O Tires
6052 Cerritos Ave., Cypress, CA 90630
(714)826-6334()
CIWMB#: 30-C-04245

Econo Lube N' Tune #213
5497 Cerritos Ave., Cypress, CA 90630
(714)761-0456()
CIWMB#: 30-C-06240

Jiffy Lube #851
4942 Lincoln Ave., Cypress, CA 90630
(626)965-9689()
CIWMB#: 30-C-06182

M & N Coastline Auto & Tire Service
4005 Ball Rd., Cypress, CA 90630
(714)826-1001()
CIWMB#: 30-C-04387

Masterlube #103
5904 Lincoln Cypress, CA 90630
(714)826-2323()
CIWMB#: 30-C-01071

Masterlube #104
5971 Ball Rd., Cypress, CA 90630
(714)220-1555()
CIWMB#: 30-C-04682

Metric Motors of Cypress
6042 Cerritos Ave., Cypress, CA 90630
(714)821-4702()
CIWMB#: 30-C-05157

Fullerton
AutoZone #2898
146 N. Raymond Ave., Fullerton, CA 92831
(714)870-9772()
CIWMB#: 30-C-04488

AutoZone #5522
1801 Orangetherpe W. Fullerton, CA 92833
(714)870-8286()
CIWMB#: 30-C-06062

AutoZone #5523
102 N Euclid Fullerton, CA 92832
(714)870-8286()
CIWMB#: 30-C-04755

EZ Lube #17
4002 N Harbor Blvd., Fullerton, CA 92835
(714)871-9980()
CIWMB#: 30-C-03741

Firestone Store #27EH
1933 N Placentia Ave., Fullerton, CA 92831
(714)993-7100()
CIWMB#: 30-C-02122

Fox Service Center
1018 W Orangetherpe Fullerton, CA 92833
(714)879-1430()
CIWMB#: 30-C-02318

Fullerton College Automotive Technology
321 E Chapman Ave., Fullerton, CA 92832
(714)992-7275()
CIWMB#: 30-C-03165

Kragen Auto Parts #0731
2978 Yorba Linda Fullerton, CA 92831
(714)996-4780()
CIWMB#: 30-C-02628

Kragen Auto Parts #4133
904 W Orangetherpe Ave., Fullerton, CA 92832
(714)526-3570()
CIWMB#: 30-C-06256

Pep Boys #642
1530 S Harbor Blvd., Fullerton, CA 92832
(714)870-0700()
CIWMB#: 30-C-01755

Sunnyside 76 Car Care Center
2701 N Brea Blvd., Fullerton, CA 92835
(714)256-0773()
CIWMB#: 30-C-01381

Garden Grove
76 Pro Lube Plus
9001 Trask Ave., Garden Grove, CA 92844
(714)393-0590()
CIWMB#: 30-C-05276

AutoZone #5527
13190 Harbor Blvd., Garden Grove, CA 92843
(714)636-5665()
CIWMB#: 30-C-04760

David Murray Shell
12571 Vly View St., Garden Grove, CA 92845
(714)898-0170()
CIWMB#: 30-C-00547

Express Lube & Wash
8100 Lampson Ave., Garden Grove, CA 92841
(909)316-8261()
CIWMB#: 30-C-06544

Firestone Store #7180
10081 Chapman Ave., Garden Grove, CA 92840
(714)530-4630()
CIWMB#: 30-C-01224

Firestone Store #71W3
13961 Brookhurst St., Garden Grove, CA 92843
(714)590-2741()
CIWMB#: 30-C-03690

Jiffy Lube #1991
13970 Harbor Blvd., Garden Grove, CA 92843
(714)554-0610()
CIWMB#: 30-C-05400

Kragen Auto Parts #1251
13933 N Harbor Blvd., Garden Grove, CA 92843
(714)554-3780()
CIWMB#: 30-C-02663

Kragen Auto Parts #1555
9851 Chapman Ave., Garden Grove, CA 92841
(714)741-8030()
CIWMB#: 30-C-04079

Nissan of Garden Grove
9670 Trask Ave., Garden Grove, CA 92884
(714)537-0900()
CIWMB#: 30-C-06553

Toyota of Garden Grove
9444 Trask Ave., Garden Grove, CA 92844
(714)895-5595()
CIWMB#: 30-C-06555

La Habra
AutoZone #5532
1200 W Imperial Hwy., La Habra, CA 90631
(562)694-5337()
CIWMB#: 30-C-04784

Burch Ford
201 N Harbor Blvd., La Habra, CA 90631
(562)691-3225()
CIWMB#: 30-C-05179

Firestone Store #2736
1071 S Beach Blvd., La Habra, CA 90631
(562)691-1731()
CIWMB#: 30-C-01169

Kragen Auto Parts #1569
1621 W Whittier Blvd., La Habra, CA 90631
(562)905-2538()
CIWMB#: 30-C-04076

Pep Boys #997
125 W Imperial Hwy., La Habra, CA 90631
(714)447-0601()
CIWMB#: 30-C-04026

SpeedDee Oil Change & Tune-Up
1580 W Imperial Hwy., La Habra, CA 90631
(562)697-3513()

Los Alamitos
Jiffy Lube #1740
3311 Katella Ave., Los Alamitos, CA 90720
(562)596-1827()
CIWMB#: 30-C-03529

Midway City
Bolsa Transmission
8331 Bolsa Ave., Midway City, CA 92655
(714)799-6158()
CIWMB#: 30-C-05768

Placentia
Advanced Auto & Diesel
144 S Bradford Placentia, CA 92870
(714)996-8222()
CIWMB#: 30-C-06242

Castner's Auto Service
214 S. Bradford Ave., Placentia, CA 92870
(714)528-1311()
CIWMB#: 30-C-06452

Econo Lube N' Tune
100 W Chapman Ave., Placentia, CA 92870
(714)524-0424()
CIWMB#: 30-C-06454

Fairway Ford
1350 E Yorba Linda Blvd., Placentia, CA 92870
(714)524-1200()
CIWMB#: 30-C-01863

Seal Beach
M & N Coastline Auto & Tire Service
12239 Seal Beach Blvd., Seal Beach, CA 90740
(714)826-1001()
CIWMB#: 30-C-04433

Seal Beach Chevron
12541 Seal Beach Blvd., Seal Beach, CA 90740
(949)495-0774(14)
CIWMB#: 30-C-06425

Stanton
AutoZone #2806
11320 Beach Blvd., Stanton, CA 90680
(714)895-7665()
CIWMB#: 30-C-04563

Joe's Auto Clinic
11763 Beach Blvd., Stanton, CA 90680
(714)891-7715()
CIWMB#: 30-C-03253

Kragen Auto Parts #1742
11951 Beach Blvd., Stanton, CA 90680
(714)799-7574()
CIWMB#: 30-C-05231

Scher Tire #20
7000 Katella Ave., Stanton, CA 90680
(714)892-9924()
CIWMB#: 30-C-05907

USA 10 Minute Oil Change
8100 Lampson Ave., Stanton, CA 92841
(714)373-4432()
CIWMB#: 30-C-05909

Westminster
AutoZone #5543
6611 Westminster Blvd., Westminster, CA 92683
(714)893-2898()
CIWMB#: 30-C-04964

AutoZone #5544
8481 Westminster Blvd., Westminster, CA 92683
(714)891-3511()
CIWMB#: 30-C-04966

City of Westminster Corporate Yard
14381 Olive St., Westminster, CA 92683
(714)895-2876(292)
CIWMB#: 30-C-02008

Honda World
13600 Beach Blvd., Westminster, CA 92683
(714)890-8900()
CIWMB#: 30-C-03639

Jiffy Lube #1579
6011 Westminster Blvd., Westminster, CA 92683
(714)899-2727()
CIWMB#: 30-C-02745

John's Brake & Auto Repair
13050 Hoover St., Westminster, CA 92683
(714)379-2088()
CIWMB#: 30-C-05617

Kragen Auto Parts #0762
6562 Westminster Blvd., Westminster, CA 92683
(714)898-0810()
CIWMB#: 30-C-02590

Midway City Sanitary District
14451 Cedarwood St., Westminster, CA 92683
(714)893-3553()
CIWMB#: 30-C-01626

Pep Boys #653
15221 Beach Blvd., Westminster, CA 92683
(714)893-8544()
CIWMB#: 30-C-03415

Yorba Linda
AutoZone #5545
18528 Yorba Linda Blvd., Yorba Linda, CA 92886
(714)970-8933()
CIWMB#: 30-C-04971

Econo Lube N' Tune
22270 La Palma Ave., Yorba Linda, CA 92887
(714)692-8394()
CIWMB#: 30-C-06513

EZ Lube Inc. #41
17511 Yorba Linda Blvd., Yorba Linda, CA 92886
(714)556-1312()
CIWMB#: 30-C-05739

Firestone Store #27T3
18500 Yorba Linda Blvd., Yorba Linda, CA 92886
(714)779-1966()
CIWMB#: 30-C-01222

Jiffy Lube #1532
16751 Yorba Linda Blvd., Yorba Linda, CA 92886
(714)528-2800()
CIWMB#: 30-C-03777

Mike Schultz Import Service
4832 Eureka Ave., Yorba Linda, CA 92886
(714)528-4411()
CIWMB#: 30-C-04313

This information was provided by the County of Orange Integrated Waste Management Department and the California Integrated Waste Management Board (CIWMB).

Attachment B



303(d) list

8	Newport Bay, Upper (Ecological Reserve)	Estuary	80111000 / 18070201	<ul style="list-style-type: none"> • Chlordane <ul style="list-style-type: none"> ◦ Source Unknown • Copper <ul style="list-style-type: none"> ◦ Source Unknown • DDT (Dichlorodiphenyltrichloroethane) <ul style="list-style-type: none"> ◦ Source Unknown • Indicator Bacteria <ul style="list-style-type: none"> ◦ Source Unknown • Metals <ul style="list-style-type: none"> ◦ Urban Runoff/Storm Sewers • Nutrients <ul style="list-style-type: none"> ◦ Source Unknown • PCBs (Polychlorinated biphenyls) <ul style="list-style-type: none"> ◦ Source Unknown • Pesticides <ul style="list-style-type: none"> ◦ Agriculture ◦ Unknown Nonpoint Source • Sediment Toxicity <ul style="list-style-type: none"> ◦ Source Unknown • Sedimentation/Siltation <ul style="list-style-type: none"> ◦ Agriculture ◦ Channel Erosion ◦ Construction/Land Development ◦ Erosion/Siltation 	653 Acres	2006
					653 Acres	2006
					653 Acres	2006
					653 Acres	
					653 Acres	1992
					653 Acres	2006
					653 Acres	2006
					653 Acres	1992
					653 Acres	2006
					653 Acres	2006

Attachment C

BMP Fact Sheet and Calculations

TENTATIVE TRACT NO. 18064

HYDROLOGY

85th Percentile Rainfall (inch) =

0.75



Soil Group D

EXISTING AREA		Elev 1	Elev 2	Length	Diff	Slope	impervious	Pervious	% imp	%per	
	ft ²	ac	ft	ft	ft	ft/ft	ft ²	ft ²	(%)	(%)	
Area I	72,729	1.67	72.1	70.62	420.5	1.48	0.004	65,824	6,905	0.905	0.095

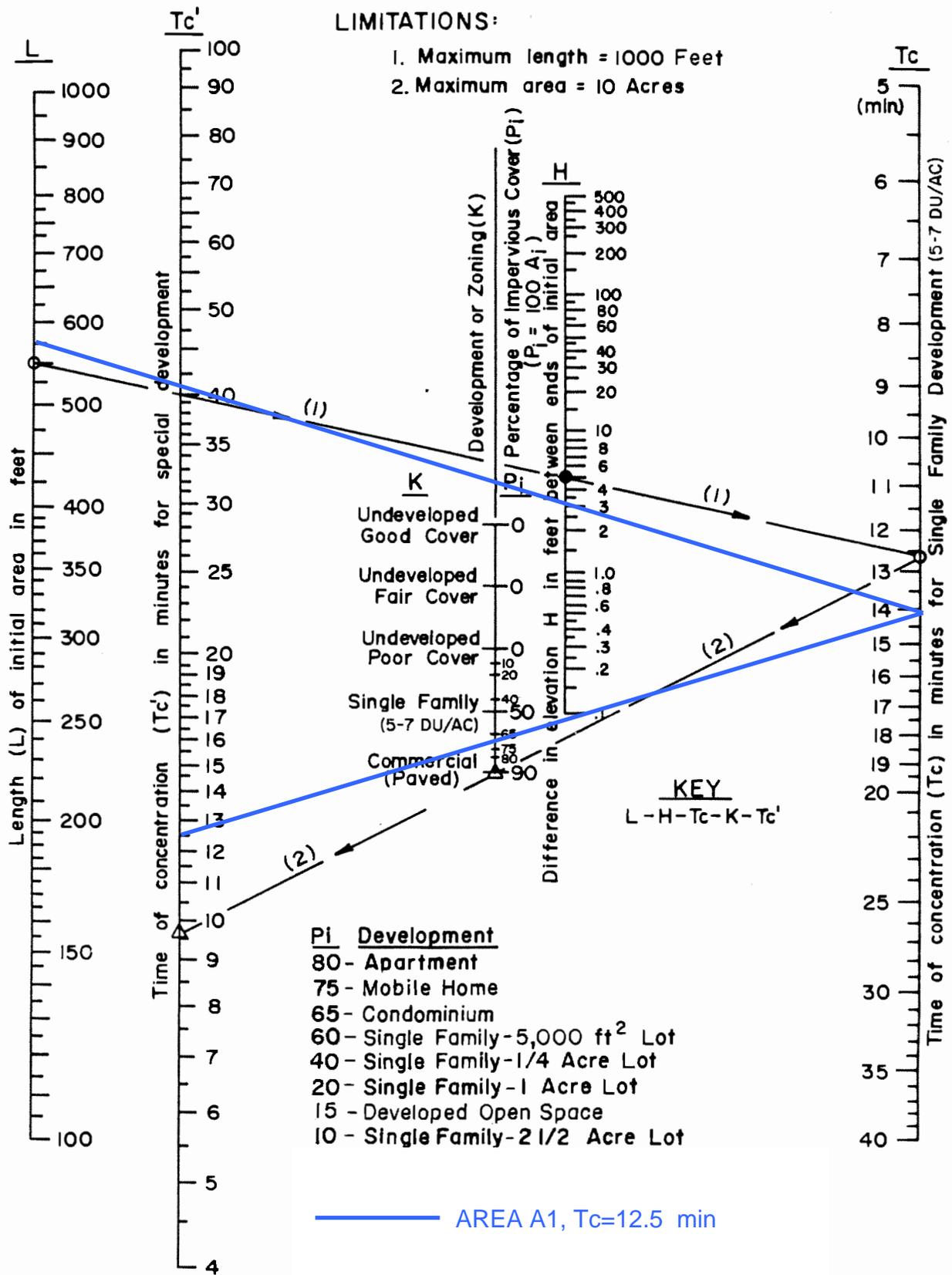
RATIONAL METHOD STUDY FORM

ORANGE COUNTY HYDROLOGY MANUAL		STUDY NAME: 1506 West 1st Street, Santa Ana, CA								Calc'd By: T.G		Date: 6/28/2016		
		PRE- DEVELOPMENT								Checked I P.G.		Date: 7/2/2016		
		2-YEAR STORM RATIONAL METHOD STUDY										Page 1 of 1		
Concentration Point	AREA (Acres)		Soil Type	Dev. Type	Tt min	Tc min	I in/hr	Fm in/hr	Fm avg	Q Total	Flow Path	Slope ft/ft	V ft/sec	Hydraulics and Notes
	Subarea	Total												
Area I	1.67	1.67	D	S.F.	-	11.0	1.440	0.02	0.02	2.10	420.5	0.0035	-	INITIAL SUBAREA
														INITIAL SUBAREA
a _p = pervious area fraction			F _p = infiltration rate for pervious area, from soil group											
					AREA I	AREA II								AREA I
				a _p	0.1				F _m = a _p * F _p	=				0.02
				a _i	0.905				F _p		0.2			
C = 0.9 (a _i + (I - F _p)(a _p /I))			C											
				1	2				C					
				a _p /I	I - F _p	2*1	a _i +3							
			I	0.0695	1.240	0.1	1.0	0.8920499						

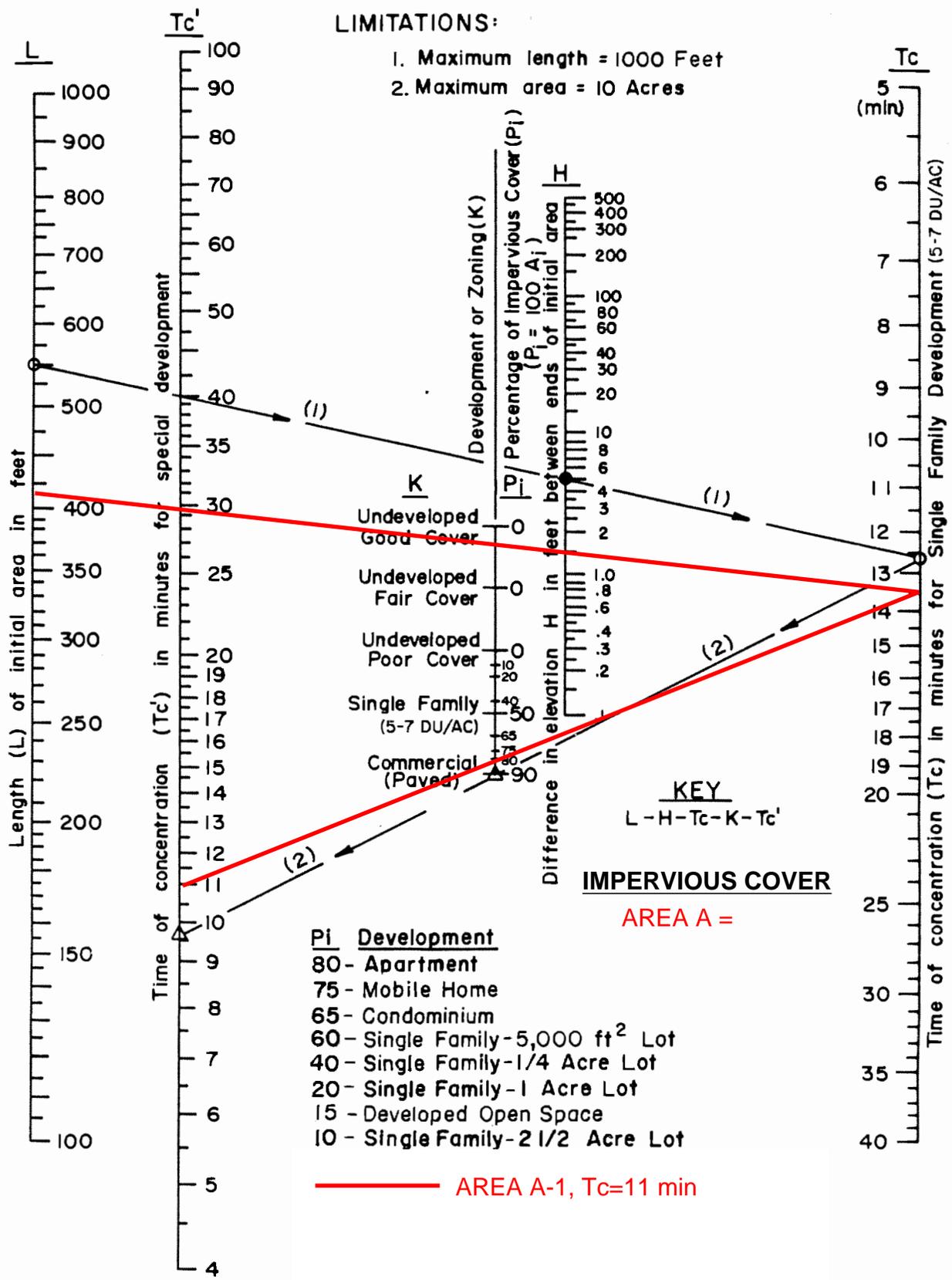
POST-DEVELOPMENT

LIMITATIONS:

1. Maximum length = 1000 Feet
2. Maximum area = 10 Acres



PRE-DEVELOPMENT



TENTATIVE TRACT NO. 18064

HYDROLOGY

85th Percentile Rainfall (inch) = 0.75 Soil Group D

EXISTING AREA			Elev 1	Elev 2	Length	Diff	Slope	impervious	Pervious	% imp	%per
	ft ²	ac	ft	ft	ft	ft	ft/ft	ft ²	ft ²	(%)	(%)
Area I	72,729	1.67	72.98	69.94	564	3.04	0.005	55,329	17,400	0.761	0.239

RATIONAL METHOD STUDY FORM

ORANGE COUNTY HYDROLOGY MANUAL			STUDY NAME: 1506 West 1st Street, Santa Ana, CA								Calc'd By: T.G		Date: 6/28/2016	
			POST- DEVELOPMENT 2-YEAR STORM RATIONAL METHOD STUDY								Checked I P.G.		Date: 7/2/2016	
Page 1 of 1														
Concentration Point	AREA (Acres)		Soil Type	Dev. Type	Tt min	Tc min	I in/hr	Fm in/hr	Fm avg	Q Total	Flow Path	Slope ft/ft	V ft/sec	Hydraulics and Notes
	Subarea	Total												
Area I	1.67	1.67	D	S.F.	-	13.0	1.308	0.02	0.02	1.91	564	0.0054	-	INITIAL SUBAREA
														INITIAL SUBAREA
a _p = pervious area fraction			F _p = infiltration rate for pervious area, from soil group											
					AREA I	AREA II							AREA I	
				a _p	0.1				F _m =a _p *F _p	=			0.02	
				a _i	0.761				F _p		0.2			
C=0.9 (a _i + (I-F _p)(a _p /I))			C											
				1	2				C					
				a _p /I	I-F _p	2*1	a _i +3							
			I	0.0764	1.108	0.1	0.8	0.7609192						

TENTATIVE TRACT NO. 18064

HYDROLOGY

85th Percentile Rainfall (inch) = 0.75 Soil Group D

EXISTING AREA			Elev 1	Elev 2	Length	Diff	Slope	impervious	Pervious	% imp	%per
	ft ²	ac	ft	ft	ft	ft	ft/ft	ft ²	ft ²	(%)	(%)
Area I	72,729	1.67	72.1	70.62	420.5	1.48	0.004	65,824	6,905	0.905	0.095

RATIONAL METHOD STUDY FORM

ORANGE COUNTY HYDROLOGY MANUAL			STUDY NAME: 1506 West 1st Street, Santa Ana, CA								Calc'd By: T.G		Date: 6/28/2016	
			PRE- DEVELOPMENT								Checked I P.G.		Date: 7/2/2016	
			10-YEAR STORM RATIONAL METHOD STUDY								Page 1 of 1			
Concentration Point	AREA (Acres)		Soil Type	Dev. Type	Tt min	Tc min	I in/hr	Fm in/hr	Fm avg	Q Total	Flow Path	Slope ft/ft	V ft/sec	Hydraulics and Notes
	Subarea	Total												
Area I	1.67	1.67	D	S.F.	-	11.0	2.584	0.02	0.02	3.79	420.5	0.0035	-	INITIAL SUBAREA
														INITIAL SUBAREA
a _p = pervious area fraction			F _p = infiltration rate for pervious area, from soil group											
					AREA I	AREA II								AREA I
				a _p	0.1				F _m =a _p *F _p	=				0.02
				a _i	0.905				F _p		0.2			
C=0.9 (a _i + (I-F _p)(a _p /I))			C											
				1	2				C					
				a _p /I	I-F _p	2*1	a _i +3							
			I	0.0387	2.384	0.1	1.0	0.8975863						

TENTATIVE TRACT NO. 18064

HYDROLOGY

85th Percentile Rainfall (inch) = 0.75 Soil Group D

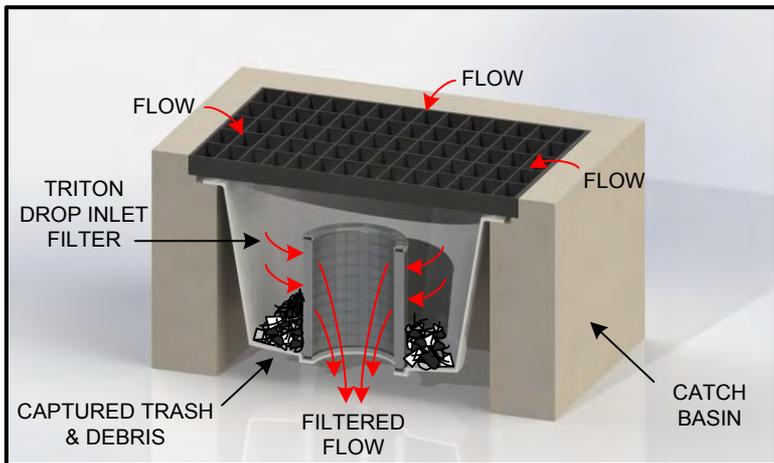
EXISTING AREA		Elev 1	Elev 2	Length	Diff	Slope	impervious	Pervious	% imp	%per	
ft ²	ac	ft	ft	ft	ft	ft/ft	ft ²	ft ²	(%)	(%)	
Area I	72,729	1.67	72.98	69.94	564	3.04	0.005	55,329	17,400	0.761	0.239

RATIONAL METHOD STUDY FORM

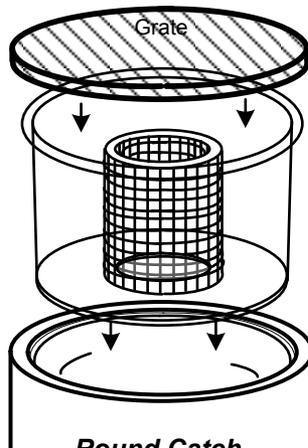
ORANGE COUNTY HYDROLOGY MANUAL		STUDY NAME: 1506 West 1st Street, Santa Ana, CA								Calc'd By: T.G		Date: 6/28/2016		
		POST- DEVELOPMENT 10-YEAR STORM RATIONAL METHOD STUDY								Checked I P.G.		Date: 7/2/2016		
Page 1 of 1														
Concentration Point	AREA (Acres)		Soil Type	Dev. Type	Tt min	Tc min	I in/hr	Fm in/hr	Fm avg	Q Total	Flow Path	Slope ft/ft	V ft/sec	Hydraulics and Notes
	Subarea	Total												
Area I	1.67	1.67	D	S.F.	-	13.0	2.348	0.02	0.02	3.44	564	0.0054	-	INITIAL SUBAREA
														INITIAL SUBAREA
a _p = pervious area fraction				F _p = infiltration rate for pervious area, from soil group										
					AREA I	AREA II								AREA I
				a _p	0.1				F _m = a _p * F _p	=				0.02
				a _i	0.761				F _p		0.2			
C = 0.9 (a _i + (I - F _p)(a _p /I))				C	0.767									
				1	2				C					
				a _p /I	I - F _p	2*1	a _i +3							
			I	0.0426	2.148	0.1	0.9	0.7670139						

REM's TRITON – TR (Drop Inlet) Series

The REM TRITON -TR Filter is a multipurpose catch basin insert designed to capture sediment, trash, debris, suspended solids, oils & grease and other storm water pollutants. TRITON -TR filters may be utilized in new construction or retrofitted in existing catch basin structures. They are sized to spec or modified in the field for drains with unusual dimensions and unique frame and grates. Filter Cartridges may be easily removed when servicing. Media strategy may be optimized for specific pollutant concerns.



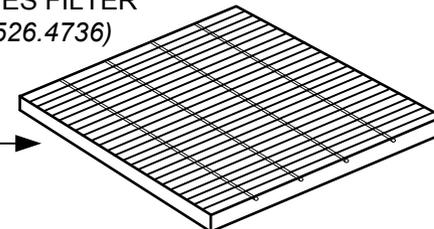
Model: TR24SR (shown above)



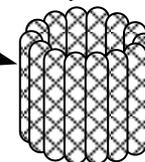
Round Catch Basin Shown

TRITON – TR SERIES FILTER
By REM Inc. (888.526.4736)

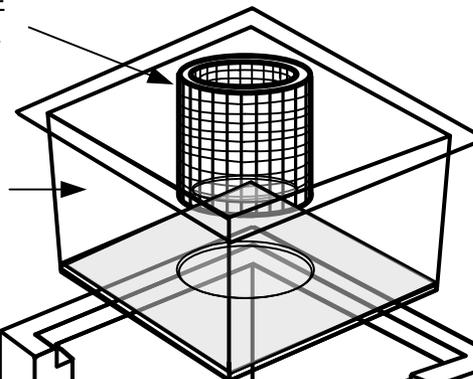
GRATE



REPLACABLE ABSORBENT MEDIA-PAKS

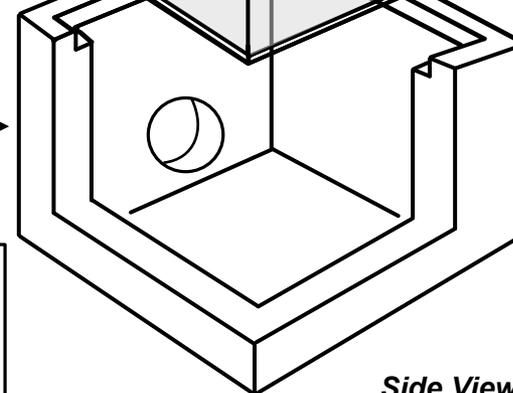


STAINLESS STEEL REMOVABLE CARTRIDGE HOUSING



FILTER BODY

CATCH BASIN



Side View

MADE IN USA

Notes:

- The TRITON - TR Series Filters may be customized in the field to fit catch basins with irregular dimensions or unusual frame and grate types. REM also designs custom filters for unique storm water infrastructures and applications.
- Filter bodies are constructed using **100% recycled** High Molecular Weight Polyethylene Plastic (HMWPE) with added U.V. inhibitors.
- Filter cartridge housings are constructed utilizing Type 304 Stainless Steel, with 2" welded square openings.
- Removable cartridge tops are constructed utilizing over 80% recycled ABS Plastic.
- REM TRITON replacement Filter Media Packs are charged with REM FOG media an expanded volcanic ash medium treated to be highly hydrophobic housed in a durable geo-textile perforated polypropylene woven fabric. REM FOG media effectively encapsulates liquefied petroleum hydrocarbons (Fats, Oils & Grease including animal fats). The media's hydrophobic characteristic allows for greater polishing of flow resulting in the reduction of Total Suspended Solids (TSS). Suspended solid reduction includes but is not limited to debris, trash, silt sediment and agglomerated heavy metals. (Additional media options are available including mixed blends of granulated carbon [AC] and Zeolite [ZEO].)
- REM TRITON filter cartridges are removable for ease of cleaning and maintenance.
- Filter designs include a high flow overflow bypass to eliminate pooling or flooding during heavy rain events.
- See our Specifier Sheet for sizes, models and flow rate information.
- Maintenance information and replacement REM Media Packs are available upon request by contacting REM at sales@remfilters.com or (888) 526-4736.
- Made in the USA.

Cartridge Diameter size may vary by catch basin. Taller cartridge options provide greater volume capacity and increased treatment rates.

THE DESIGN AND DETAIL OF THIS DRAWING IS THE PROPERTY OF REM INC. AND IS NOT TO BE USED EXCEPT IN CONNECTION WITH OUR WORK, DESIGN AND INVENTION RIGHTS ARE RESERVED.

U.S. Patent Number:
6,217,757

PH: (888) 526-4736

DIMENSIONS ARE IN INCHES
UNLESS OTHERWISE NOTED.

REM Inc.

TRITON DROP INLET SERIES
(TRITON Cartridge System)

SCA LE	DRAWN BY: C.F.	FOR: Drop Inlet Combinations	REV
1/4 : 1	DATE: 11/3/2014	SHE ET 1 OF 1	

For design assistance, drawings,
and pricing send completed worksheet to:
dyods@contech-cpi.com



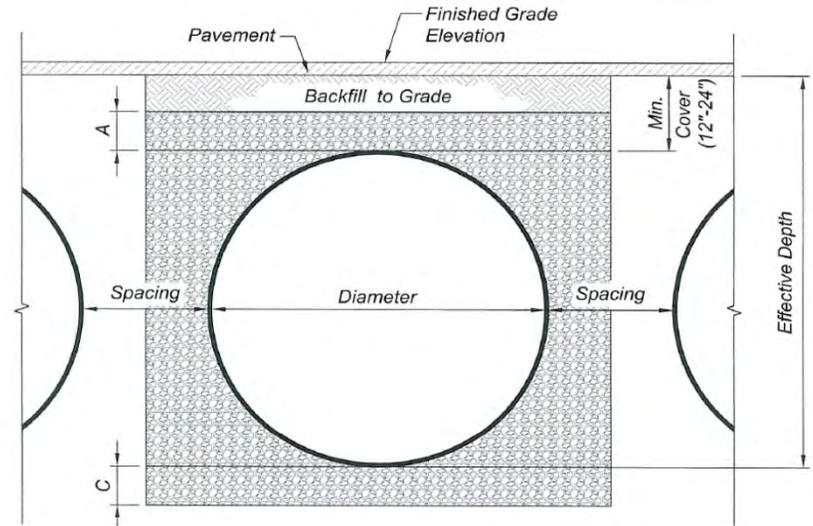
Project Summary

Date:	7/8/2016
Project Name:	costa mesa
City / County:	Orange
State:	CA
Designed By:	CDH
Company:	Contech
Telephone:	

Enter Information in
Blue Cells

Corrugated Metal Pipe Calculator

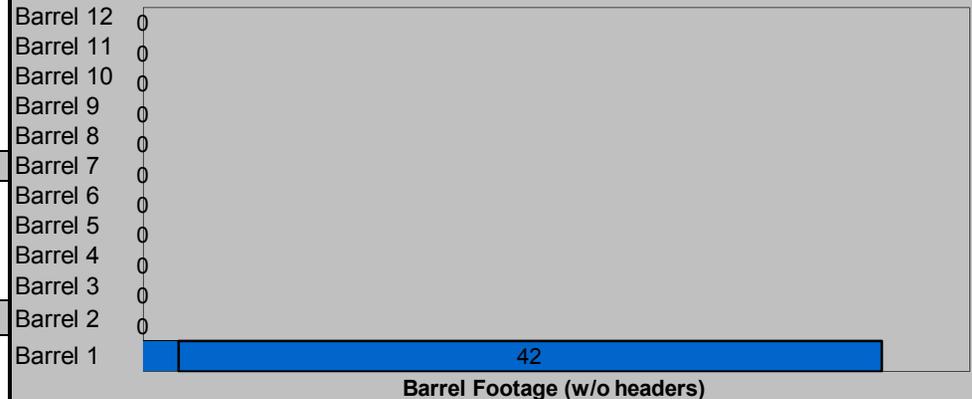
Storage Volume Required (cf):	3,274	50.27 ft ² Pipe Area
Limiting Width (ft):	12.00	
Invert Depth Below Asphalt (ft):	15.00	
Solid or Perforated Pipe:	Perforated	
Shape Or Diameter (in):	96	
Number Of Headers:	1	
Spacing between Barrels (ft):	3.00	
Stone Width Around Perimeter of System (ft):	1	
Depth A: Porous Stone Above Pipe (in):	6	
Depth C: Porous Stone Below Pipe (in):	6	
Stone Porosity (0 to 40%):	40	



System Sizing

Pipe Storage:	2,513 cf	
Porous Stone Storage:	867 cf	
Total Storage Provided:	3,380 cf	103.2% Of Required Storage
Number of Barrels:	1 barrels	
Length per Barrel:	42.0 ft	
Length Per Header:	8.0 ft	
Rectangular Footprint (W x L):	10. ft x 52. ft	

System Layout



CONTECH Materials

Total CMP Footage:	50 ft
Approximate Total Pieces:	3 pcs
Approximate Coupling Bands:	2 bands
Approximate Truckloads:	2 trucks

Construction Quantities**

Total Excavation:	289 cy
Porous Stone Backfill For Storage:	80 cy stone
Backfill to Grade Excluding Stone:	116 cy fill

**Construction quantities are approximate and should be verified upon final design

Attachment D

O & M PLAN



Operations and Maintenance (O&M) Plan

**Preliminary Water Quality Management Plan
for**

Tentative Tract No. 18064

Project Name:

Costa Mesa Residential Development

2507 Carnegie Ave, Costa Mesa, CA

**Preliminary Water Quality Management Plan (WQMP)
Tentative Tract 18064
Exhibit B, Operations and Maintenance Plan**

BMP Applicable ? Yes/No	BMP Name and BMP Implementation, Maintenance and Inspection Procedures	Implementation, Maintenance, and Inspection Frequency and Schedule	Person or Entity with Operation & Maintenance Responsibility
Non-Structural Source Control BMPs			
Yes	<p>N1. Education for Property Owners, Tenants and Occupants These information materials will be provided to educate the residents/occupants/tenants on general housekeeping practices that contribute to the protection of stormwater quality. This will bring awareness in people about stormwater pollutants and its consequences. These materials will be initially developed and provided to first residents/occupants/tenants by the developer.</p>	These materials will be initially developed and provided to the first residents/occupants/tenants by the developer and after that it will be HOA's responsibility to distribute	Owner/HOA
Yes	<p>N2. Activity Restrictions The purpose of this restrictions list is to protect surface water quality. The developer must prepare the rules and regulation pertaining to discharge of any pollutants. This includes no discharges of fertilizer, pesticides, and wastes to streets or storm drains, no blowing or sweeping of debris into streets or storm drains, no vehicle washing on-site, no vehicle repair/tire on site</p>	This activity initially prepared by the developer for the surface water quality protection. The home owner association will be responsible for enforcing the restrictions	Home Owner's Association (HOA)
Yes	<p>N3. Common Area Landscape Management Routine checkup and maintenance is required to minimize problem related erosion, irrigation leakage. HOA will have to establish more sustainable approach such as to conserve water, reduce pesticide, and fertilizer. All landscaped areas will be suppressed two inches below top of curb to retain nutrients, irrigation water and small storms. Irrigation equipment shall be monitored monthly for proper operation to conserve water. Plants with low water requirements will be planted to reduce water and fertilizer needs</p>	Landscape Management program should be outline by HOA and it's HOA responsibility to continue provide service to the landscape area weekly and visit the site monthly for any maintenance related issues.	HOA/ Can hire a Private Management company who can maintain the landscape area.

**Preliminary Water Quality Management Plan (WQMP)
Tentative Tract 18064
Exhibit B, Operations and Maintenance Plan**

BMP Applicable ? Yes/No	BMP Name and BMP Implementation, Maintenance and Inspection Procedures	Implementation, Maintenance, and Inspection Frequency and Schedule	Person or Entity with Operation & Maintenance Responsibility
Yes	<p>N4. BMP Maintenance Inspect twice a year, once before start of rainy season. Remove accumulated sediment or trash. For addition information see Manufactures maintenance, inspection and cleaning brochure</p>	<p>6 Month See manufacture Inspection/Maintenance</p>	<p>HOA</p>
Yes	<p>N14. Common Area Catch Basin Inspection Cleaning should take place in the late summer/early fall prior to the start of the rainy season. Drainage facilities include catch basins (storm drain inlets), area drain. The proposed catch basins and area drain shall be inspected on a quarterly basis, at minimum. They will be cleaned whenever they are greater than 25% full of debris.</p>	<p>Starting and ending of the rainy season every year</p>	<p>HOA</p>
Yes	<p>N15. Street Sweeping Private Streets and Parking Lots The HOA shall be responsible for sweeping the surrounding parking lot and on Private Street on a regular basis to remove debris. Regular Street Sweeping lessens the effect of contamination on stormwater.</p>	<p>Twice a month to remove debris (HOA can hire sweeping contractor)</p>	<p>HOA</p>
Structural Source Control BMPs			

**Preliminary Water Quality Management Plan (WQMP)
Tentative Tract 18064
Exhibit B, Operations and Maintenance Plan**

BMP Applicable ? Yes/No	BMP Name and BMP Implementation, Maintenance and Inspection Procedures	Implementation, Maintenance, and Inspection Frequency and Schedule	Person or Entity with Operation & Maintenance Responsibility
Yes	<p>S1. Provide Storm Drain System Stenciling and Signage The catch basins shall be stamped or labeled with the message “No Dumping - Drains to Ocean”. The storm drain label/stencil shall be checked for legibility once per year and shall be reapplied as necessary to maintain legibility.</p>	Inspect the legibility of Signage once a year and replace it if necessary to maintain legibility	HOA
Yes	<p>S4. Use Efficient Irrigation Systems and Landscape Design The irrigation system will include devices to prevent low head drainage, overspray and runoff through the use of pressure regulating devices, check valves, flow sensors, proper spacing, low precipitation emission devices and ET or water based controllers. Check irrigation equipment monthly to ensure there are no leaks or excess runoff from landscaped areas. Adjust irrigation heads and timing as necessary to prevent over or under-watering of vegetation and excessive runoff from landscaped areas.</p>	The HOA will be responsible for maintaining the irrigation system and checking the system quarterly. The HOA can hire contractor to overlook the system	HOA

**Preliminary Water Quality Management Plan (WQMP)
Tentative Tract 18064
Exhibit B, Operations and Maintenance Plan**

BMP Name and BMP Implementation, Maintenance and Inspection Procedures	Implementation, Maintenance, and Inspection Frequency and Schedule	Person or Entity with Operation & Maintenance Responsibility
Low Impact Development BMPs		
Infiltration BMP CMP Detention System - Inspect twice a year, once before start of rainy season. System should be cleaned when inspection reveals that accumulated sediment or rash is clogging the discharge orifice.	6months HOA is responsible for managing the system (can hire a manufacture or contractor to maintain the CMP system) See Contech CMP Detention & Infiltration Maintenance guidelines	HOA
Pre-Treatment/Gross Solids Removal BMPs		
Catch Basin Inserts (REM TRITON Filters) – Filters are inspected and serviced 3 times a year. Filters be serviced and maintained when debris and pollutant accumulations exceed no more than 80% of the filter’s capacity.	4months HOA is responsible for managing the system (can hire a manufacture or contractor to maintain) See REM manufacturer’s Resources Operation and Maintenance and Procedures	HOA

**Preliminary Water Quality Management Plan (WQMP)
Tentative Tract 18064
Exhibit B, Operations and Maintenance Plan**

Required Permits

This section must list any permits required for the implementation, operation, and maintenance of the BMPs. Possible examples are:

- Permits for connection to sanitary sewer
- Permits from California Department of Fish and Game
- Encroachment permits

If no permits are required, a statement to that effect should be made.

Forms to Record BMP Implementation, Maintenance, and Inspection

The form that will be used to record implementation, maintenance, and inspection of BMPs is attached.

Recordkeeping

All records must be maintained for at least five (5) years and must be made available for review upon request.

**Preliminary Water Quality Management Plan (WQMP)
Tentative Tract 18064
Exhibit B, Operations and Maintenance Plan**

RECORD OF BMP IMPLEMENTATION, MAINTENANCE, AND INSPECTION

Today's Date: _____

**Name of Person Performing Activity
(Printed):** _____

Signature: _____

BMP Name (As Shown in O&M Plan)	Brief Description of Implementation, Maintenance, and Inspection Activity Performed



Revel Environmental Manufacturing Inc.

sales@remfilters.com (888) 526-4736 Lic. No. 857410

Northern California
960-B Detroit Avenue
Concord, California 94518
P: (925) 676-4736
F: (925) 676-8676

Southern California
2110 South Grand Avenue
Santa Ana, California 92705
P: (714) 557-2676
F: (714) 557-2679

Operation & Maintenance (O&M) and Procedures

REM TRITON Filter Recommended Maintenance Procedures:

Maintenance and Inspections:

In order to ensure proper operation, REM (Revel Environmental Manufacturing, Inc.) recommends that REM Stormwater filters be serviced and maintained when debris and pollutant accumulations exceed no more than 80% of the filter's capacity. REM recommends that the filters are inspected and serviced at a minimum of three times (3X's) per seasonal cycle year. The frequency and length of duration between inspections and maintenance may fluctuate based on specific site conditions such as local weather conditions, site use, and pollutant type and loading volume.

Filter Media Replacement:

In order to ensure proper operation, REM recommends that the FOG Media, or other specified media (such as Activated Carbon, and/or Zeolite) be replaced when the outer surface of media is no more than 50% coated with contaminants. (The surface area of REM's standard FOG media is stark white in color. The media will blacken with encapsulated contaminants over time.) It is recommended that REM media packs and Bioflex be replaced a minimum of one time (1X) per seasonal cycle year. Sites with higher pollutant loading concentrations may require more frequent service and media replacement. Purchase replacement media packs from REM at (888) 526-4736 or sales@remfilters.com. Custom media configurations are available upon.

Disposal:

Captured pollutant debris and spent media must be disposed of in accordance with all Federal, State, and Local Laws and Regulations.

On-site Procedures for Triton Catch Basin Filter Inserts:

1. Secure area (proceed with traffic and pedestrian control plan).
2. Clean surface area immediately around each storm drain utilizing a stiff bristled push-broom, flat shovel or industrial vacuum.
3. Proceed with confined space procedures as necessary.
4. Remove grate or manhole cover and set aside.
5. Inspect perimeter filter flange gasket. Confirm media cartridge is secure in the filter basin.
6. Remove debris trapped in grate slot openings.
7. Utilize an industrial vacuum to remove debris from within filter basin.
8. Pressure wash media pack through the stainless steel cartridge. (Avoid discharge by utilizing an industrial vacuum to remove excess water while pressure washing).
9. Inspect media housed inside stainless steel cartridge. REM recommends replacing the filter media a minimum of once a year (see *Filter Media Replacement* above).
10. Place grate or manhole cover back on catch basin grate frame.
11. Secure dated service lock-out tag on grate lid.
12. Identify catch basin on site map for tracking and reporting.
13. Note observations, concerns or recommendation regarding specific filter on maintenance report.
14. Remove pedestrian and/or traffic control barricades.



Contech[®] CMP Detention & Infiltration Maintenance Guide



Contech® CMP Detention

Maintenance

Underground storm water detention and retention systems should be inspected at regular intervals and maintained when necessary to ensure optimum performance. The rate at which the system collects pollutants will depend more heavily on site activities than the size or configuration of the system.

Inspection

Inspection is the key to effective maintenance and is easily performed. CONTECH recommends ongoing quarterly inspections of the accumulated sediment. Sediment deposition and transport may vary from year to year and quarterly inspections will help insure that systems are cleaned out at the appropriate time. Inspections should be performed more often in the winter months in climates where sanding operations may lead to rapid accumulations, or in equipment washdown areas. It is very useful to keep a record of each inspection. A sample inspection log is included for your use.

Systems should be cleaned when inspection reveals that accumulated sediment or trash is clogging the discharge orifice. CONTECH suggests that all systems be designed with an access/inspection manhole situated at or near the inlet and the outlet orifice. Should it be necessary to get inside the system to perform maintenance activities, all appropriate precautions regarding confined space entry and OSHA regulations should be followed.

Cleaning

Maintaining an underground detention or retention system is easiest when there is no flow entering the system. For this reason, it is a good idea to schedule the cleanout during dry weather.

Accumulated sediment and trash can typically be evacuated through the manhole over the outlet orifice. If maintenance is not performed as recommended, sediment and trash may accumulate in front of the outlet orifice. Manhole covers should be securely seated following cleaning activities.

Inspection & Maintenance Log Sample Template

_____ " Diameter System			Location: Anywhere, USA		
Date	Depth of Sediment	Accumulated Trash	Maintenance Performed	Maintenance Personnel	Comments
12/01/10	2"	None	Removed Sediment	B. Johnson	Installed
03/01/11	1"	Some	Removed Sediment and Trash	B. Johnson	Swept parking lot
06/01/11	0"	None	None		
09/01/11	0"	Heavy	Removed Trash	S. Riley	
12/01/11	1"	None	Removed Sediment	S. Riley	
04/01/12	0"	None	None	S. Riley	
04/15/01	2	Some	Removed Sediment and Trash	ACE Environmental Services	

SAMPLE



Support

Drawings and specifications are available at www.ContechES.com.

Site-specific support is available from our engineers.



800.338.1122

www.ContechES.com

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Attachment E

Worksheets from County of Orange TGD

**Costa Mesa Residential Development
Tract No. 18064
2507 Carnegie Ave, Costa Mesa, CA**

Worksheet B: Simple Design Capture Volume Sizing Method

Step 1: Determine the design capture storm depth used for calculating volume			
1	Enter design capture storm depth from Figure III.1, d (inches)	$d=$	0.75 inches
2	Enter the effect of provided HSCs, d_{HSC} (inches) (Worksheet A)	$d_{HSC}=$	inches
3	Calculate the remainder of the design capture storm depth, $d_{remainder}$ (inches) (Line 1 – Line 2)	$d_{remainder}=$	0.75 inches
Step 2: Calculate the DCV			
1	Enter Project area tributary to BMP (s), A (acres)	$A=$.67 acres
2	Enter Project Imperviousness, imp (unitless)	$imp=$.761
3	Calculate runoff coefficient, $C= (0.75 \times imp) + 0.15$	$C=$.72
4	Calculate runoff volume, $V_{design}= (C \times d_{remainder} \times A \times 43560 \times (1/12))$	$V_{design}=$	3,274 cu-ft 
Step 3: Design BMPs to ensure full retention of the DCV			
Step 3a: Determine design infiltration rate			
1	Enter measured infiltration rate, $K_{measured}$ (in/hr) (Appendix VII)	$K_{measured}=$	In/hr
2	Enter combined safety factor from Worksheet H, S_{final} (unitless)	$S_{final}=$	
3	Calculate design infiltration rate, $K_{design} = K_{measured} / S_{final}$	$K_{design}=$	In/hr
Step 3b: Determine minimum BMP footprint			
4	Enter drawdown time, T (max 48 hours)	$T=$	Hours
5	Calculate max retention depth that can be drawn down within the drawdown time (feet), $D_{max} = K_{design} \times T \times (1/12)$	$D_{max}=$	feet
6	Calculate minimum area required for BMP (sq-ft), $A_{min} = V_{design} / d_{max}$	$A_{min}=$	sq-ft

**Costa Mesa Residential Development
Tract No. 18064
2507 Carnegie Ave, Costa Mesa, CA**

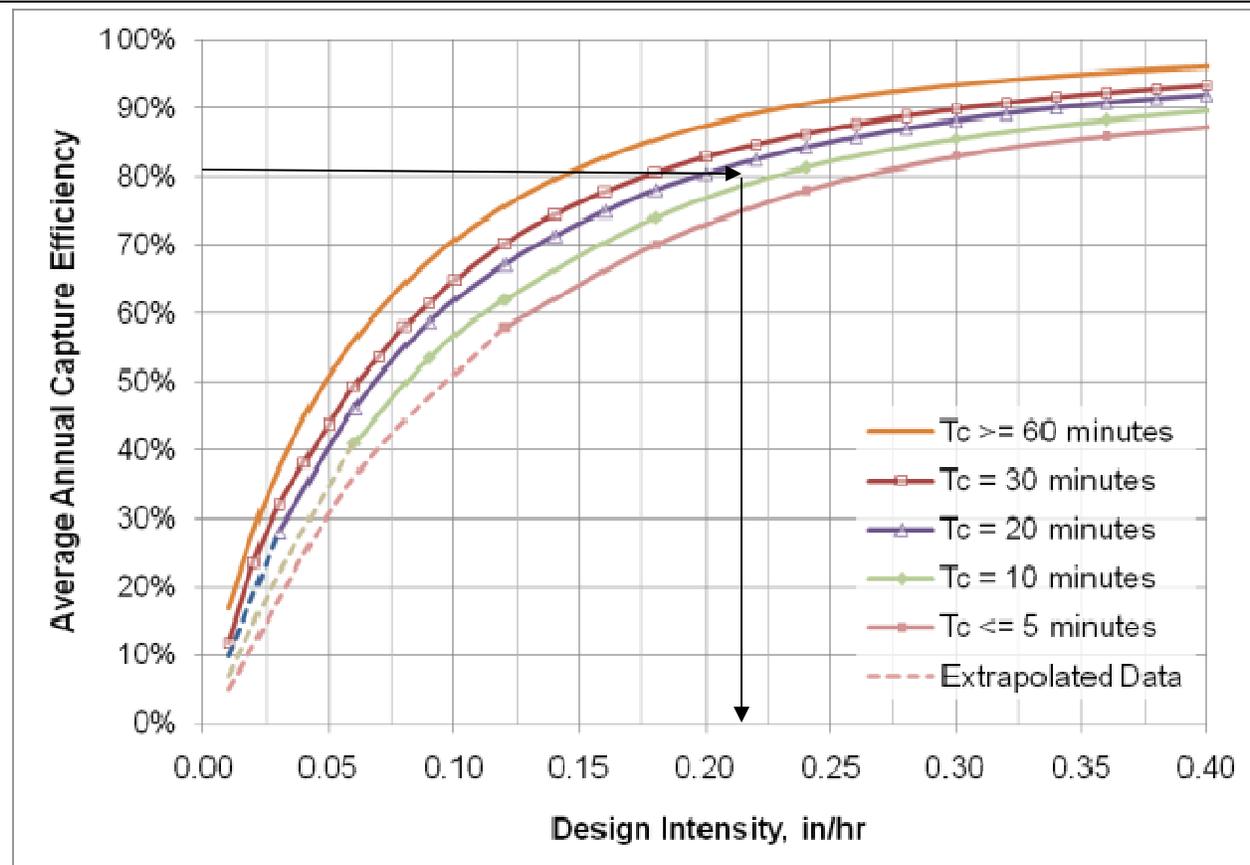
Worksheet D: Capture Efficiency Method for Flow-Based BMPs

Step 1: Determine the design capture storm depth used for calculating volume				
1	Enter the time of concentration, T_c (min) (See Appendix IV.2)	$T_c =$	13	
2	Using Figure III.4, determine the design intensity at which the estimated time of concentration (T_c) achieves 80% capture efficiency, I_1	$I_1 =$	0.22	in/hr
3	Enter the effect depth of provided HSCs upstream, d_{HSC} (inches) (Worksheet A)	$d_{HSC} =$		inches
4	Enter capture efficiency corresponding to d_{HSC} , Y_2 (Worksheet A)	$Y_2 =$		%
5	Using Figure III.4, determine the design intensity at which the time of concentration (T_c) achieves the upstream capture efficiency (Y_2), I_2	$I_2 =$		
6	Determine the design intensity that must be provided by BMP, $I_{design} = I_1 - I_2$	$I_{design} =$	0.22	
Step 2: Calculate the design flowrate				
1	Enter Project area tributary to BMP (s), A (acres)	$A =$	1.67	acres
2	Enter Project Imperviousness, imp (unitless)	$imp =$.761	
3	Calculate runoff coefficient, $C = (0.75 \times imp) + 0.15$	$C =$.72	
4	Calculate design flowrate, $Q_{design} = (C \times I_{design} \times A)$	$Q_{design} =$.265	cfs
Supporting Calculations				
Describe system: CMP Detention System Footprint 10' x 52'				

Worksheet D: Capture Efficiency Method for Flow-Based BMPs

Provide time of concentration assumptions:
See Calculations

Graphical Operations



Provide supporting graphical operations. See Example III.7.

Attachment F

Reference Exhibits/Figures from County of Orange TGD

- *XVI.1_ Orange County Rainfall Zones*
- *XVI.2_ Infiltration Feasibility Constraint Maps*
- *XVI.3_ North Orange County Hydromodifcation Susceptibility Map Newport Bay/Newport Coastal Streams*
- *Newport Bay Watershed Map*

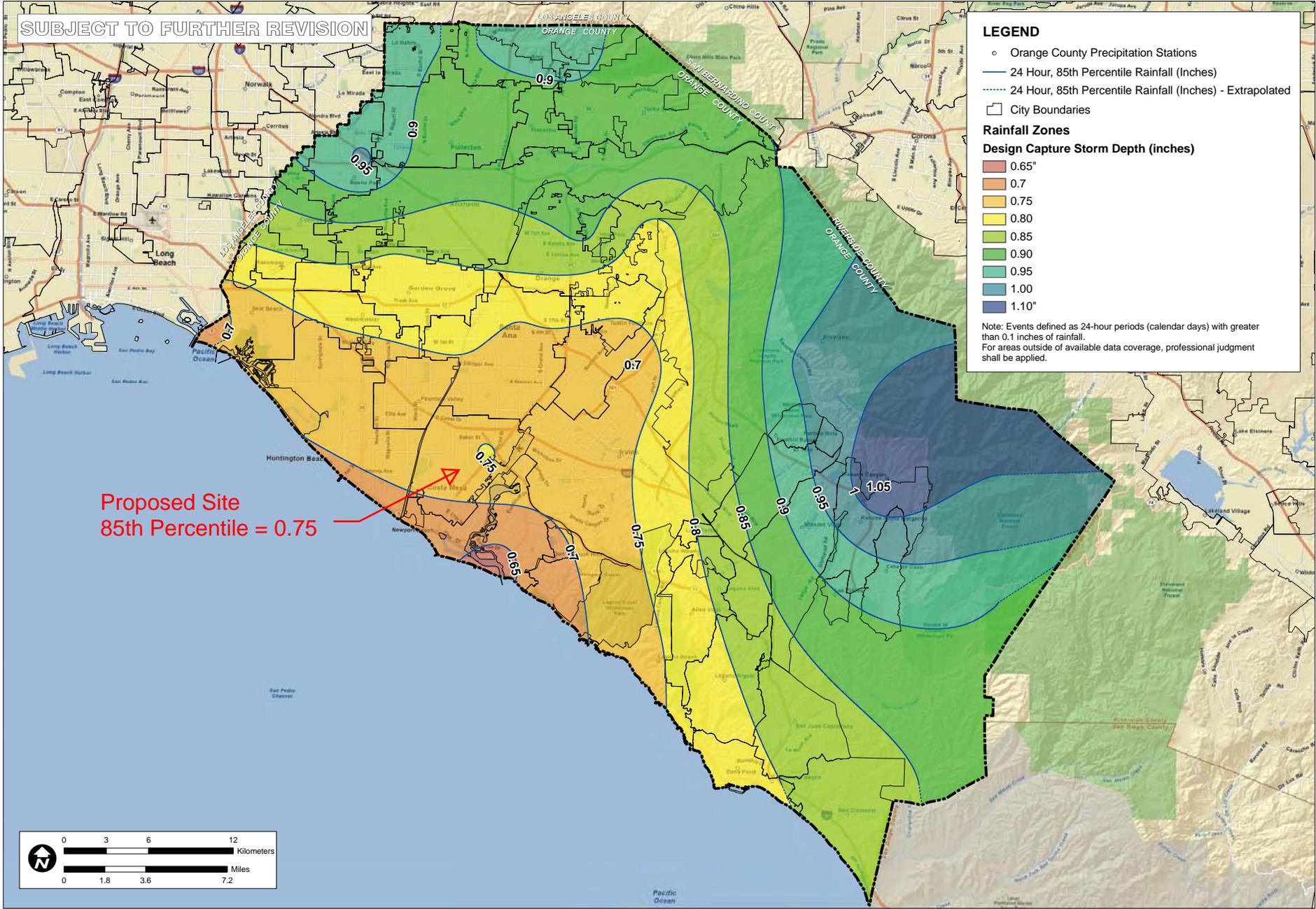
XVI.1. Rainfall Zones Map

Figure XVI.1: Orange County Rainfall Zones Map

Exhibit on following page



SUBJECT TO FURTHER REVISION



LEGEND

- Orange County Precipitation Stations
- 24 Hour, 85th Percentile Rainfall (Inches)
- ⋯ 24 Hour, 85th Percentile Rainfall (Inches) - Extrapolated
- City Boundaries

Rainfall Zones

Design Capture Storm Depth (inches)

- 0.65"
- 0.7
- 0.75
- 0.80
- 0.85
- 0.90
- 0.95
- 1.00
- 1.10"

Note: Events defined as 24-hour periods (calendar days) with greater than 0.1 inches of rainfall.
For areas outside of available data coverage, professional judgment shall be applied.

Proposed Site
85th Percentile = 0.75



RAINFALL ZONES															
ORANGE COUNTY TECHNICAL GUIDANCE DOCUMENT	ORANGE CO. CA														
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td>SCALE</td> <td>F = 1.8 inches</td> </tr> <tr> <td>DESIGNED</td> <td>TH</td> </tr> <tr> <td>DRAWN</td> <td>TH</td> </tr> <tr> <td>CHECKED</td> <td>BJP</td> </tr> <tr> <td>DATE</td> <td>04/22/19</td> </tr> <tr> <td>JOB NO.</td> <td></td> </tr> <tr> <td>SIZE</td> <td></td> </tr> </table>	SCALE	F = 1.8 inches	DESIGNED	TH	DRAWN	TH	CHECKED	BJP	DATE	04/22/19	JOB NO.		SIZE		
SCALE	F = 1.8 inches														
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DATE	04/22/19														
JOB NO.															
SIZE															
FIGURE XVI-1															

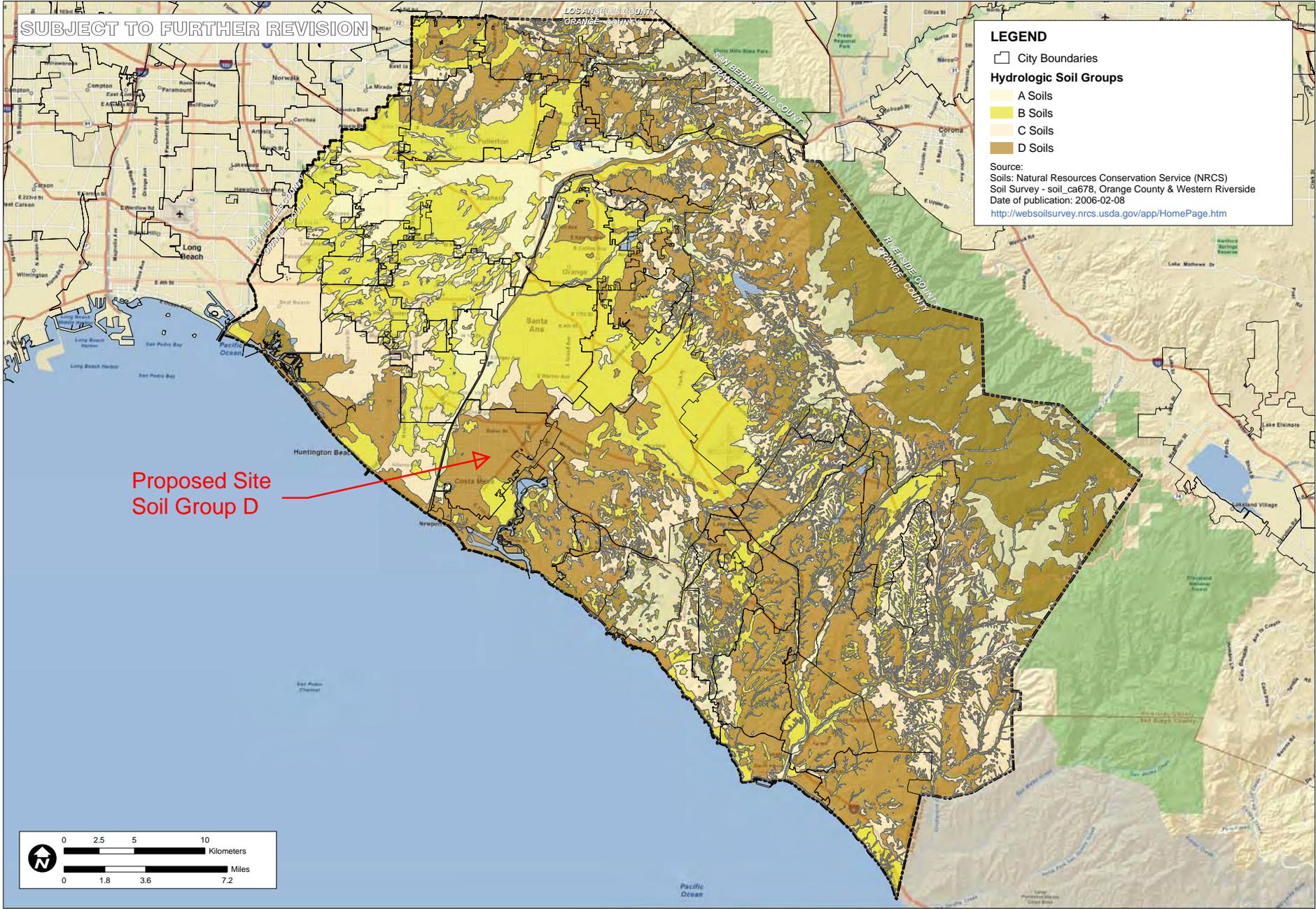
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XVI.2. Infiltration Feasibility Constraints Maps

Figure XVI.2: Infiltration Feasibility Constraints Maps

Exhibits start on following page

SUBJECT TO FURTHER REVISION

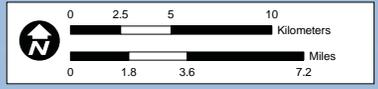


Proposed Site
Soil Group D

LEGEND

- City Boundaries
- Hydrologic Soil Groups**
 - A Soils
 - B Soils
 - C Soils
 - D Soils

Source:
Soils: Natural Resources Conservation Service (NRCS)
Soil Survey - soil_ca678, Orange County & Western Riverside
Date of publication: 2006-02-08
<http://websoilsurvey.nrcs.usda.gov/app/HomePage.htm>



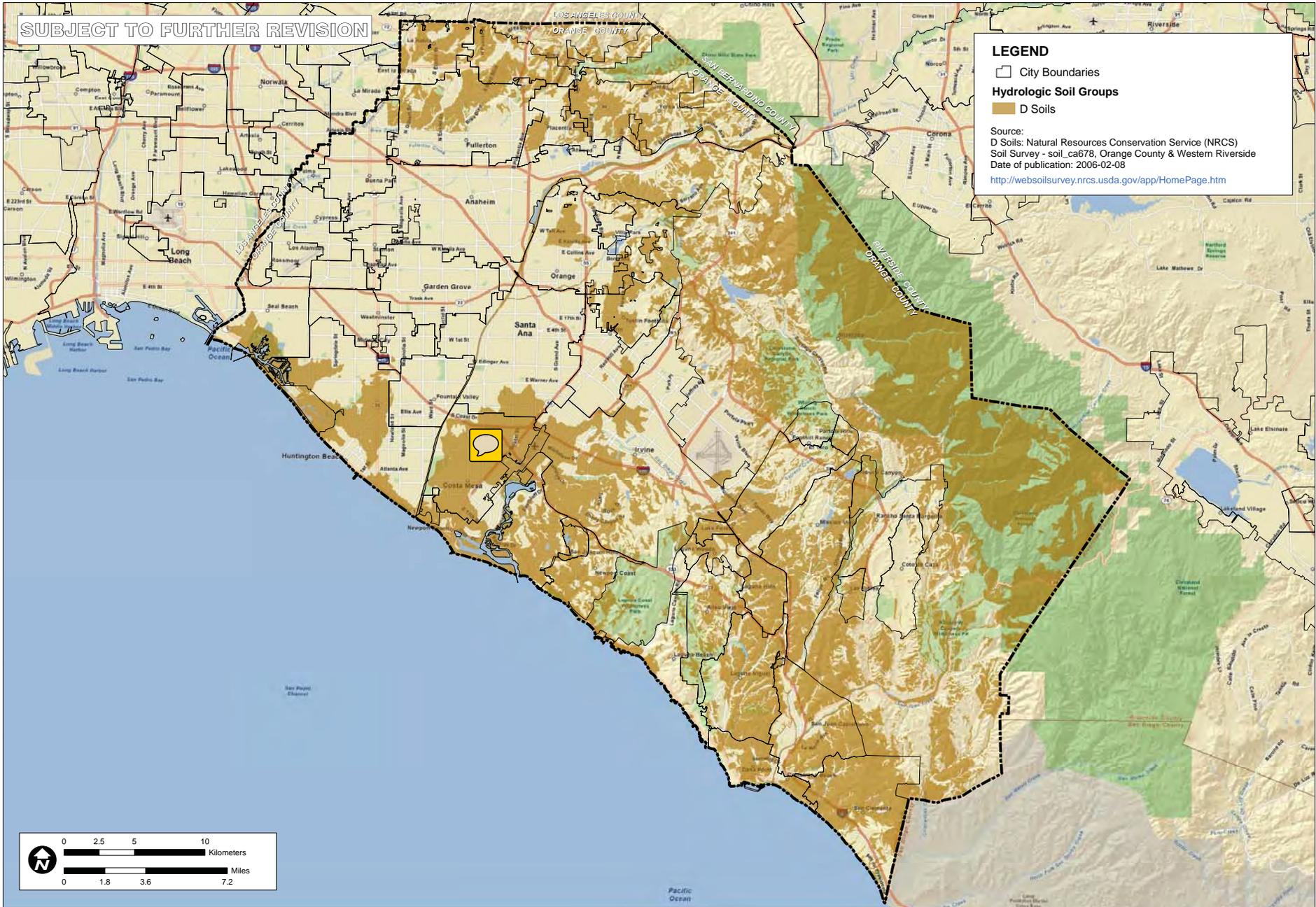
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 ORANGE COUNTY INFILTRATION STUDY
 ORANGE CO. CA

SCALE	F = 1:8,000
DESIGNED	TH
DRAWING	TH
CHECKED	BJP
DATE	02/09/11
JOB NO.	5232E

PACE
 Advanced Water Engineering

FIGURE XVI-2a

SUBJECT TO FURTHER REVISION



HYDROLOGIC SOIL GROUP
 TYPE D NRCS SOIL SURVEY

ORANGE COUNTY
 INFILTRATION STUDY

CA

ORANGE CO.

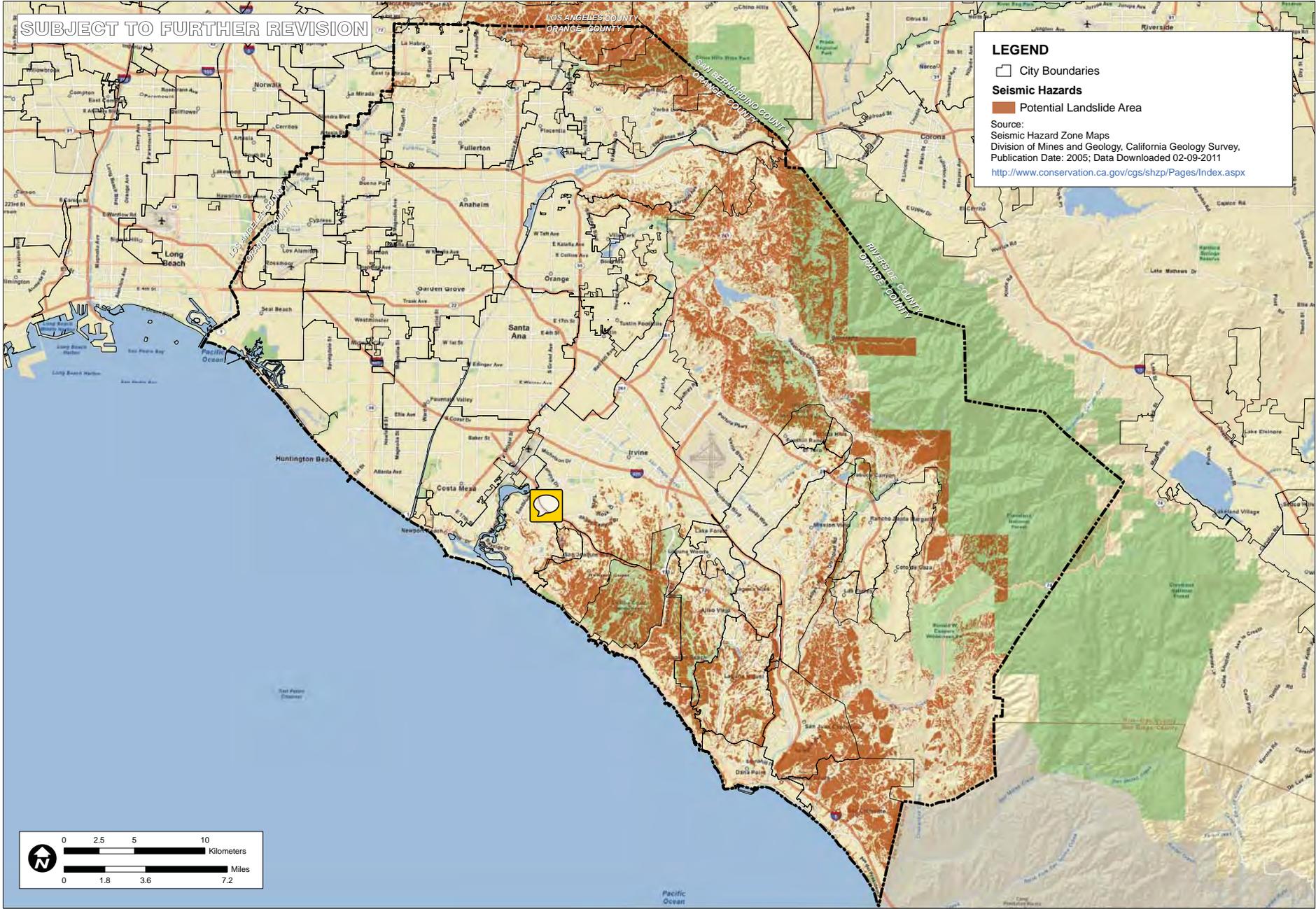
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DRAWN	TH
CHECKED	BJP
DATE	02/09/11
JOB NO.	
SCALE	



FIGURE
 XVI-2b

SUBJECT TO FURTHER REVISION



LEGEND

- City Boundaries
- Seismic Hazards**
 - Potential Landslide Area

Source:
 Seismic Hazard Zone Maps
 Division of Mines and Geology, California Geology Survey,
 Publication Date: 2005; Data Downloaded 02-09-2011
<http://www.conservation.ca.gov/cgs/shzp/Pages/Index.aspx>



TITLE
**HYDROLOGIC SOIL GROUP
 TYPE D NRCS SOIL SURVEY**

ORANGE COUNTY
 INFILTRATION STUDY

JOB NO. ORANGE CO. CA

SCALE	1" = 1.25 miles
DESIGNED	TH
DRAWN	TH
CHECKED	BMF
DATE	02/09/11
JOB NO.	5926E

FIGURE
XVI-2c

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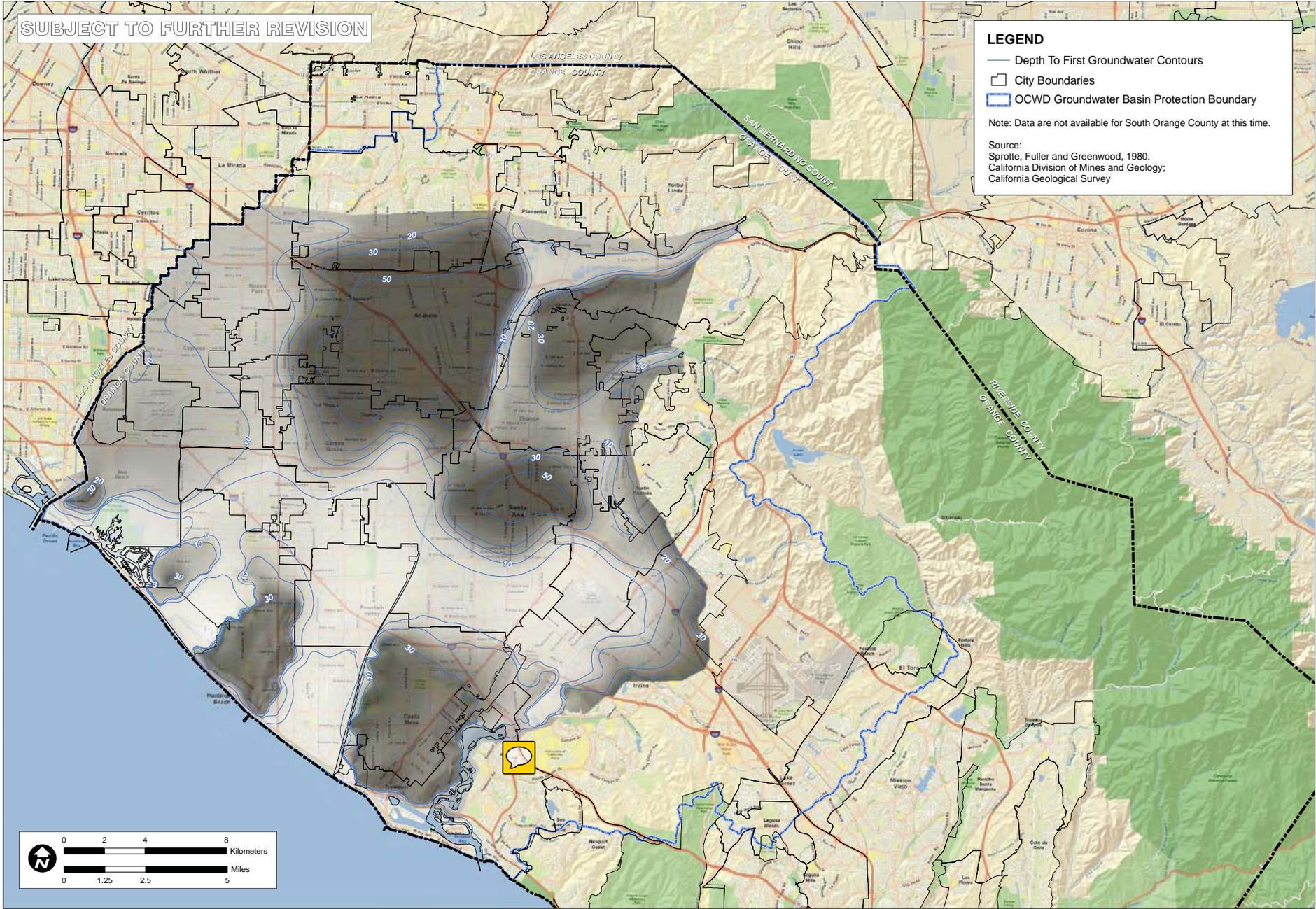
SUBJECT TO FURTHER REVISION

LEGEND

-  Depth To First Groundwater Contours
-  City Boundaries
-  OCWD Groundwater Basin Protection Boundary

Note: Data are not available for South Orange County at this time.

Source:
 Sprotte, Fuller and Greenwood, 1980.
 California Division of Mines and Geology;
 California Geological Survey



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TITLE: NORTH ORANGE COUNTY MAPPED DEPTH TO FIRST GROUNDWATER

JOB: ORANGE COUNTY INFILTRATION STUDY

SCALE: 1" = 1.25 miles

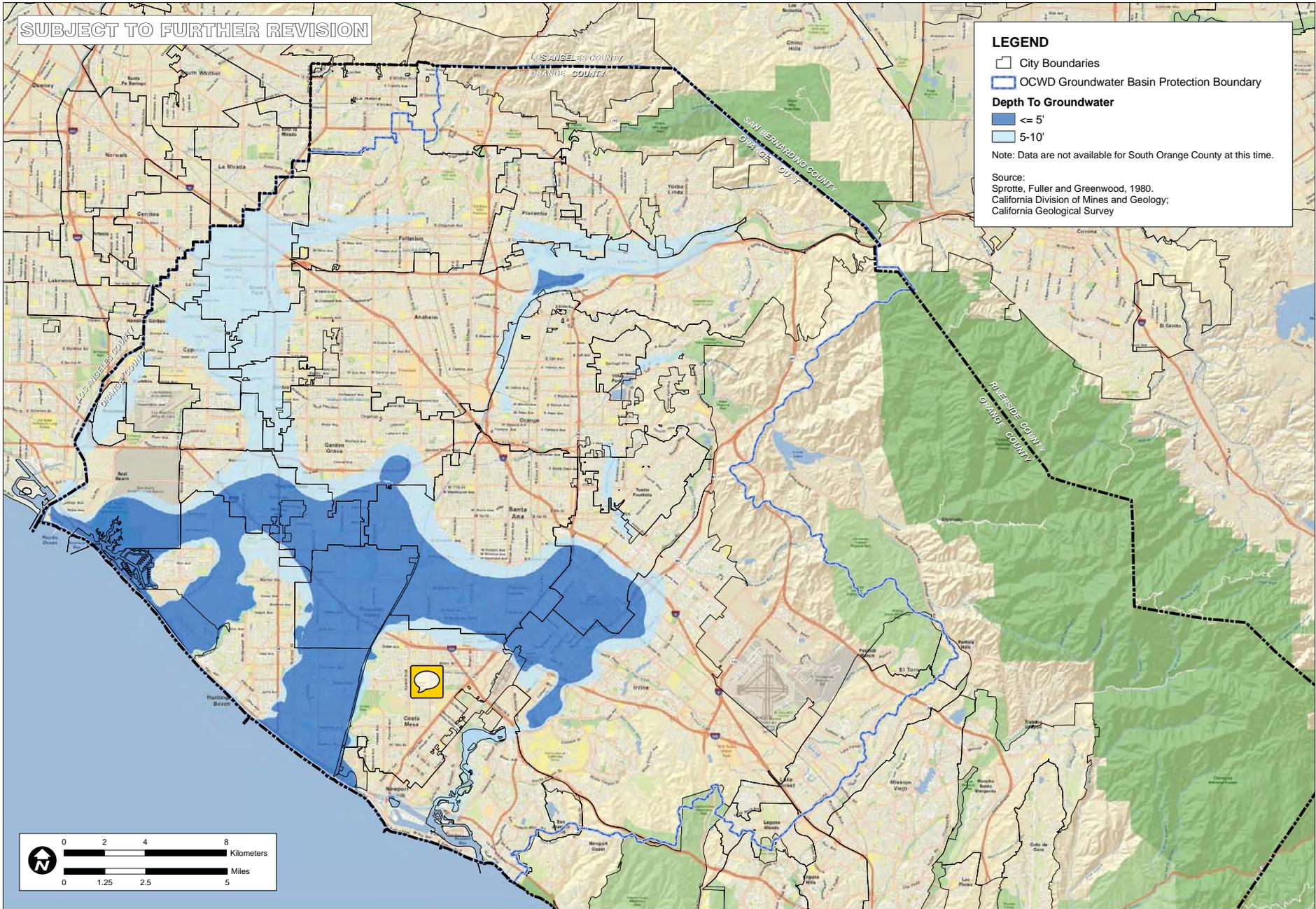
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DATE	02/09/11
JOB NO.	
SHEET	

ORANGE CO. CA

FIGURE: XVI-2d



SUBJECT TO FURTHER REVISION



LEGEND

- City Boundaries
- OCWD Groundwater Basin Protection Boundary
- Depth To Groundwater**
- <= 5'
- 5-10'

Note: Data are not available for South Orange County at this time.

Source:
Sprotte, Fuller and Greenwood, 1980.
California Division of Mines and Geology;
California Geological Survey

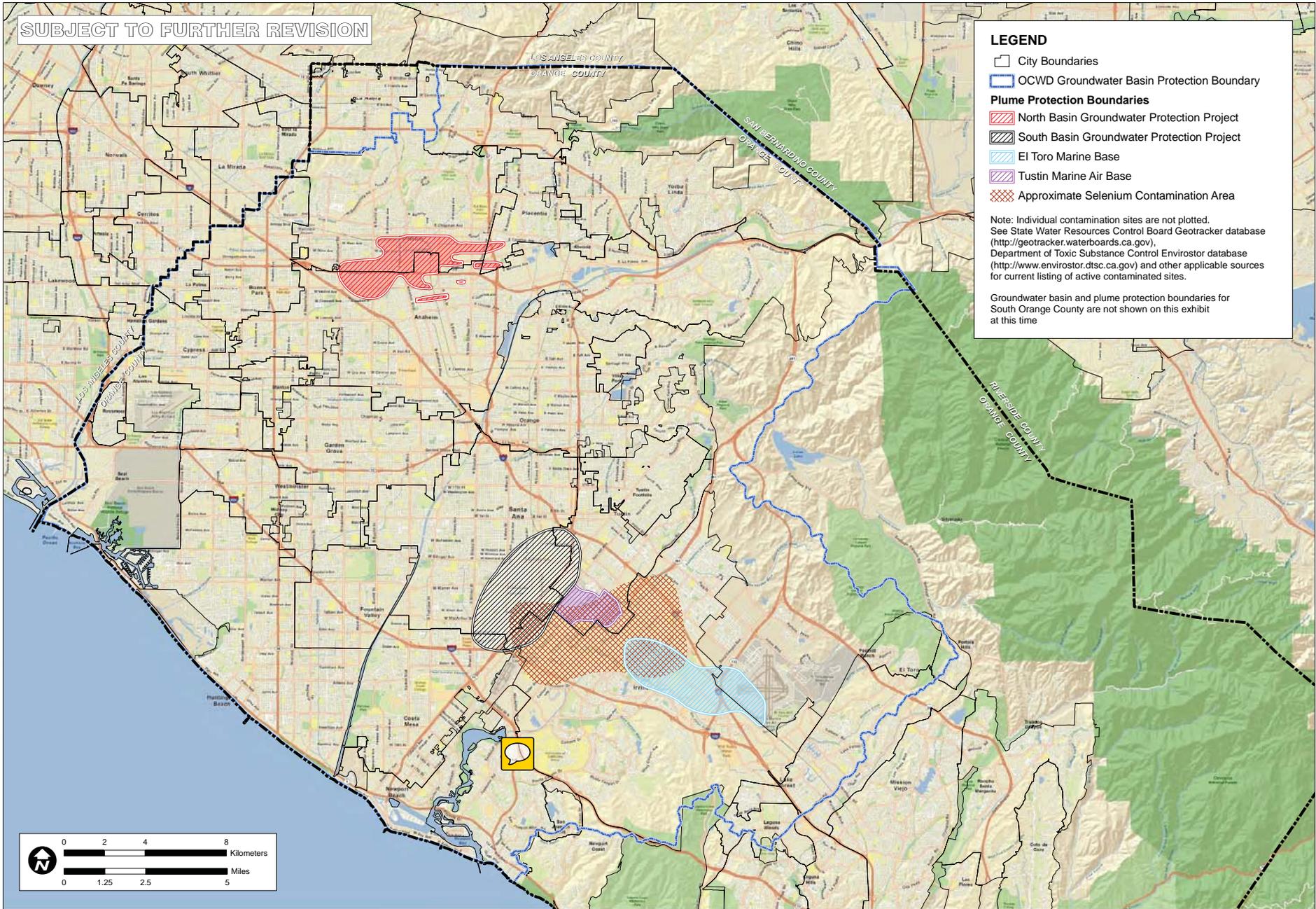


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JOB		ORANGE COUNTY INFILTRATION STUDY	
SCALE		F = 1:25,000	
DESIGNED	TH	DRAWN	TH
CHECKED	BP	DATE	02/09/11
JOB NO.	5824E	ORANGE CO.	CA
FIGURE		XVI-2e	



SUBJECT TO FURTHER REVISION

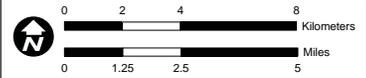


LEGEND

- City Boundaries
- OCWD Groundwater Basin Protection Boundary
- Plume Protection Boundaries**
- North Basin Groundwater Protection Project
- South Basin Groundwater Protection Project
- El Toro Marine Base
- Tustin Marine Air Base
- Approximate Selenium Contamination Area

Note: Individual contamination sites are not plotted. See State Water Resources Control Board Geotracker database (<http://geotracker.waterboards.ca.gov>), Department of Toxic Substance Control Envirostor database (<http://www.envirostor.dtsc.ca.gov>) and other applicable sources for current listing of active contaminated sites.

Groundwater basin and plume protection boundaries for South Orange County are not shown on this exhibit at this time



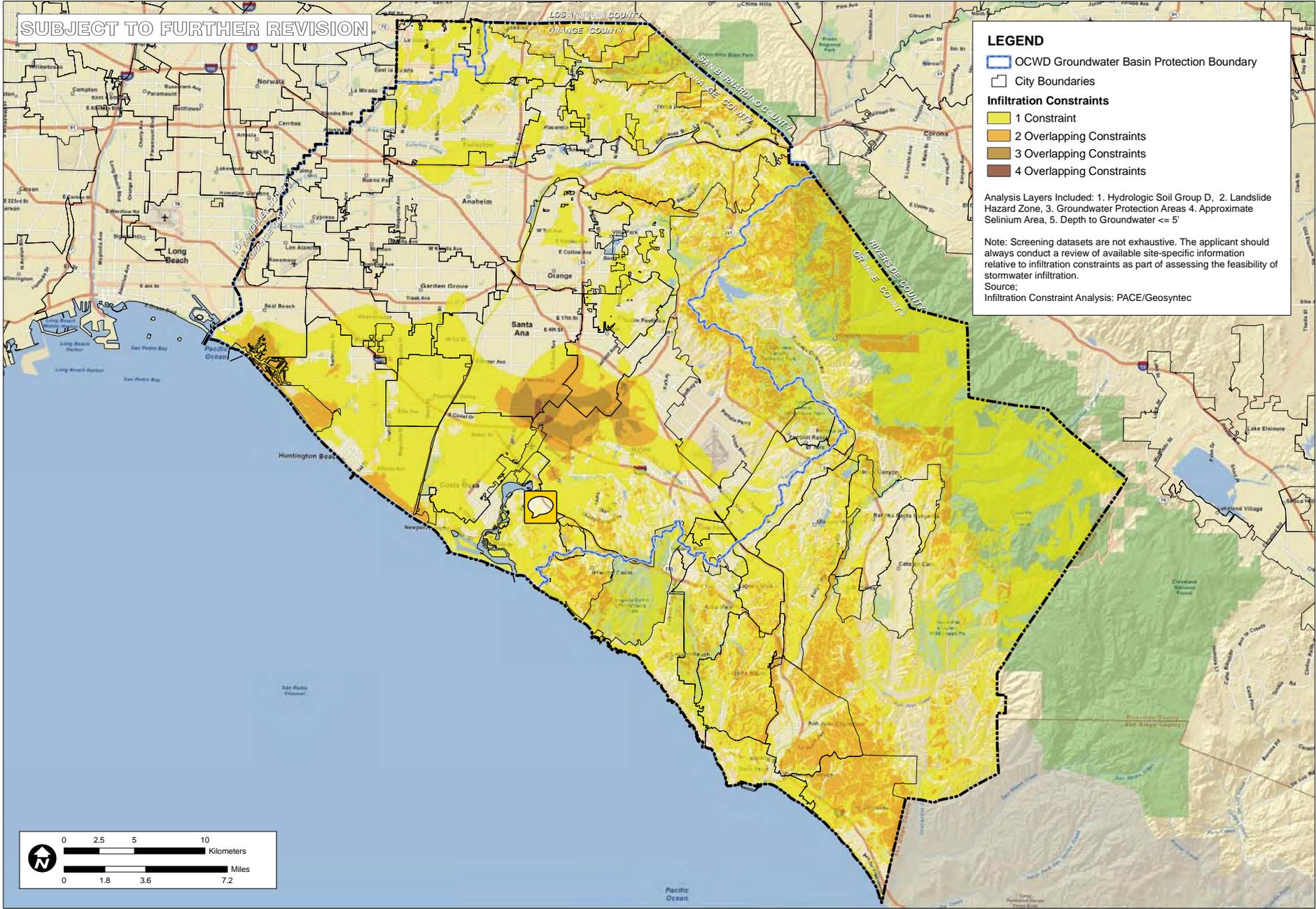
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TITLE		NORTH ORANGE COUNTY GROUNDWATER PROTECTION AREAS	
JOB		ORANGE COUNTY INFILTRATION STUDY	
SCALE		ORANGE CO.	
DESIGNED	TH	DATE	06/22/10
DRAWN	TH	JOB NO.	592E
CHECKED	BJP	SCALE	

FIGURE
XVI-2f



SUBJECT TO FURTHER REVISION



LEGEND

- OCWD Groundwater Basin Protection Boundary
- City Boundaries

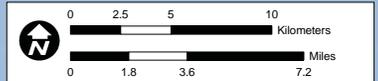
Infiltration Constraints

- 1 Constraint
- 2 Overlapping Constraints
- 3 Overlapping Constraints
- 4 Overlapping Constraints

Analysis Layers Included: 1. Hydrologic Soil Group D, 2. Landslide Hazard Zone, 3. Groundwater Protection Areas 4. Approximate Selenium Area, 5. Depth to Groundwater <= 5'

Note: Screening datasets are not exhaustive. The applicant should always conduct a review of available site-specific information relative to infiltration constraints as part of assessing the feasibility of stormwater infiltration.

Source:
Infiltration Constraint Analysis: PACE/Geosyntec



INTEGRATED INFILTRATION ANALYSIS OVERLAPPING CONSTRAINT LOCATIONS

ORANGE COUNTY INFILTRATION STUDY

ORANGE CO. CA

JOB NO. 150101519524E

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DATE	04/22/19
JOB NO.	150101519524E
SCALE	1" = 1.8 miles

FIGURE XVI-2g

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XVI.3. North Orange County Hydromodification Susceptibility Maps

Figure XVI.3: North Orange County Hydromodification Susceptibility Maps

Exhibits start on following page

PRELIMINARY MAP - SUBJECT TO FURTHER REVISION

Susceptibility

- Potential Areas of Erosion, Habitat, & Physical Structure Susceptibility

Channel Type

- Earth (Unstable)
- Earth (Stabilized)
- Stabilized

Tidel Influence

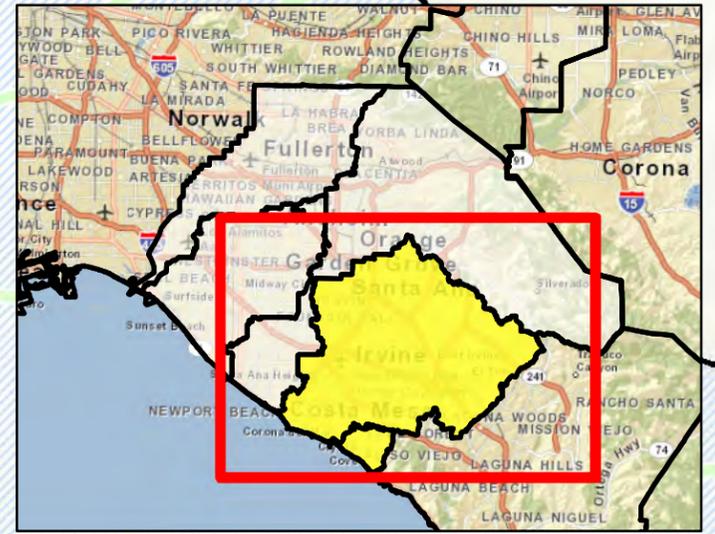
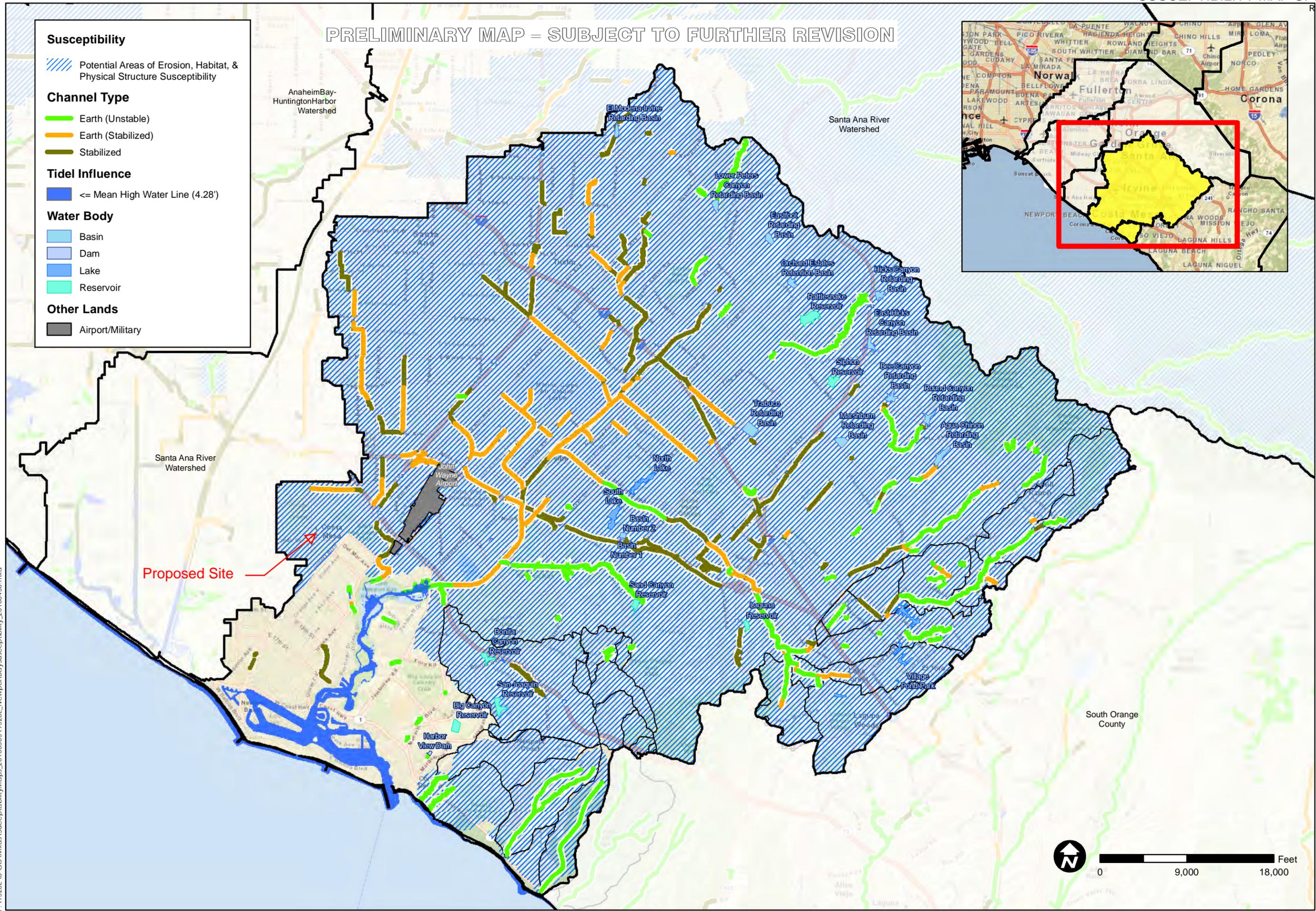
- <= Mean High Water Line (4.28')

Water Body

- Basin
- Dam
- Lake
- Reservoir

Other Lands

- Airport/Military



TITLE
**SUSCEPTIBILITY ANALYSIS
 NEWPORT BAY-
 NEWPORT COASTAL STREAMS**

JOB
**ORANGE COUNTY
 WATERSHED
 MASTER PLANNING**

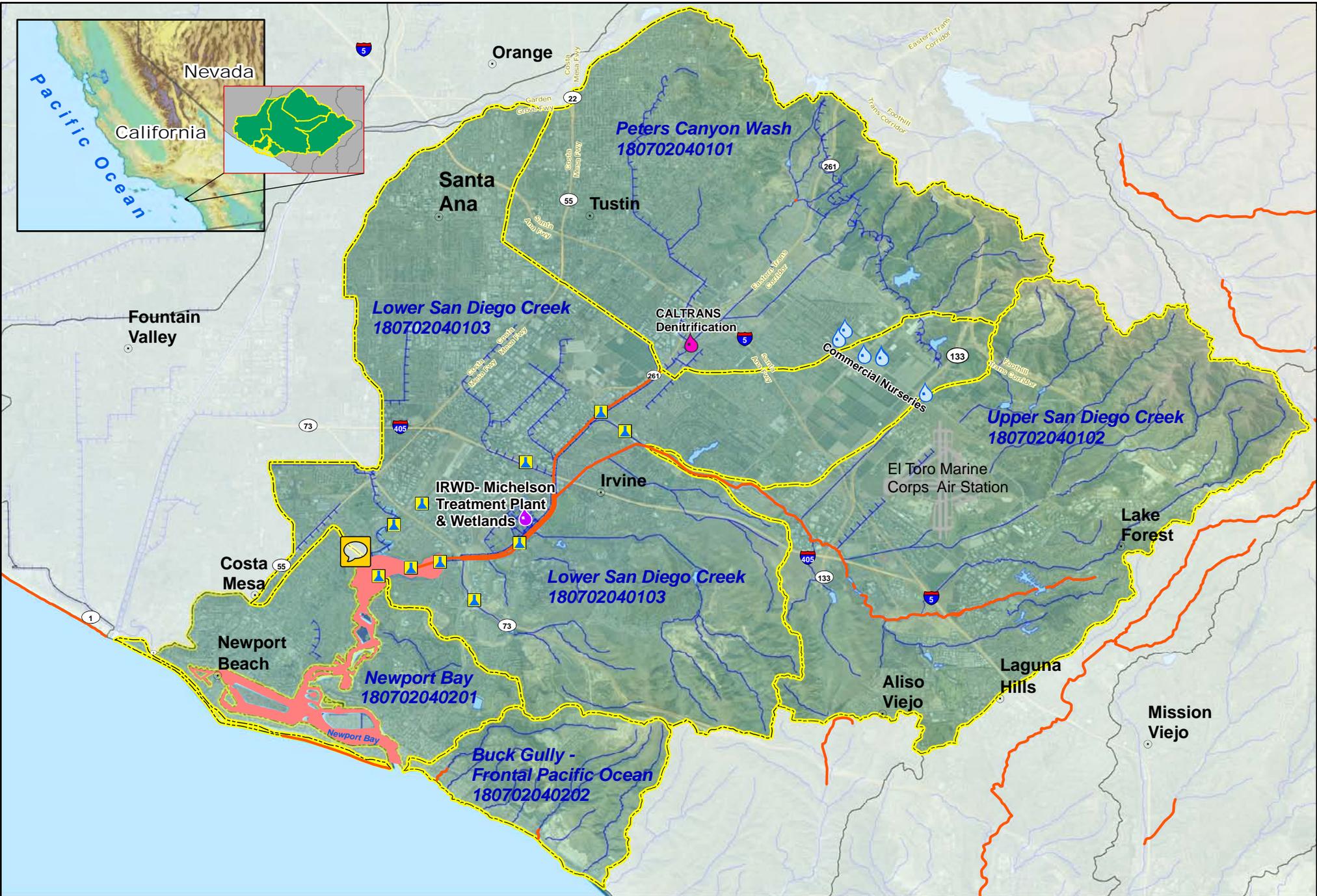
CA
 ORANGE CO.

SCALE	1" = 12,000'
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CHECKED	BMP
DATE	04/30/10
JOB NO.	9526 E



FIGURE
4

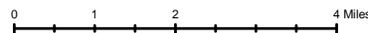
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-  Water Quality Monitoring Stations
Source: Santa Ana Regional Water Board
-  Nursery Implementation Actions
-  CALTRANS Denitrification
-  IRWD-Michelson Treatment Plant & Wetlands



Newport Bay HUC12 Watersheds

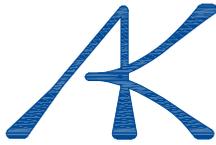


- Impaired Waters 2006 303(d) list
-  Linear
-  Area
-  Watershed Boundary



Attachment G

Geotechnical Percolation Report (for reference only)



June 10, 2016
J.N.: 2495.00

Mr. Steve Sheldon
Sheldon Development, LLC
901 Dove Street, Suite 140
Newport Beach, California 92660

**Subject: Geotechnical Investigation for Proposed Water Quality Improvements,
Proposed Residential Development, 440 Fair Drive, City of Costa Mesa,
California**

Dear Mr. Sheldon,

Pursuant to your request, *Albus-Keefe & Associates, Inc.* has completed a geotechnical investigation of the site for evaluation of the percolation characteristics of the site soils. The scope of this investigation consisted of the following:

- Exploratory drilling, soil sampling and test well installation
- Field percolation testing
- Laboratory testing of selected soil samples
- Engineering analysis of the data
- Preparation of this report

SITE DESCRIPTION AND PROPOSED DEVELOPMENT

Site Location and Description

The site is located at 440 Fair Drive within the city of Costa Mesa, California. The property is bordered by a Dodge and Fiat Auto Dealership to the north and northwest, a gas station to the southwest, Fair Drive to the south, and Carnegie Avenue to the east. The location of the site and its relationship to the surrounding areas is shown on Figure 1, Site Location Map.

The site is currently occupied by a two-story commercial building (mini-mall) with a large, asphalt paved parking lot. The northern portion of the parking lot area is currently sub-leased and used as car detailing area for a neighboring auto dealership. Associated improvements include some concrete flatwork, underground utilities and a masonry block screen wall along the east margin of the site. Chain-link fencing also bounds the property on the north and west property lines.

Vegetation on site consists of some mature trees along the east property line with some small landscape islands and planters around the building area. Based on Google Earth, topography on site is relatively level at approximately 70 feet above mean sea level. Drainage is generally directed as sheet flow to the south towards Fair Drive.



© 2016 Google



SITE LOCATION MAP

Sheldon Development, LLC
Proposed Residential Development
440 Fair Drive
Costa Mesa, California

NOT TO SCALE

FIGURE 1

Proposed Development

Based on our review of the referenced conceptual site plan, the site will developed for construction of eight (8) two-story detached homes and twenty (20) three-story duplex units. Associated interior streets, parking stalls, decorative hardscape, and underground improvements are also anticipated.

We anticipate the proposed residences will be wood-framed, slab-on-grade structures yielding relatively light foundations loads. No grading or structural plans were available in preparing this report. However, we anticipate that minor rough grading of the site will be required to achieve future surface configurations.

Storm water quality management is anticipated to utilize infiltration BMPs within the site. The specific location and type are not known at this time. The site generally drains to the north and as such, we anticipate the primary infiltration BMP will be located near the northern end of the site.

SUMMARY OF FIELD AND LABORATORY WORK

Subsurface Investigation

Subsurface exploration for this investigation was conducted on May 6, 2016. Our exploration consisted of drilling three (3) exploratory borings to depths ranging from 21 to 51.5 feet below the existing ground surface utilizing a truck-mounted, hollow-stem-auger drill rig. Representatives of *Albus-Keefe & Associates, Inc.* logged the exploratory excavations. Visual and tactile identifications were made of the materials encountered, and their descriptions are presented in the Exploration Logs in Appendix A. An additional boring was drilled adjacent Boring B-2 for percolation testing. The approximate locations of the exploratory excavations completed by this firm are shown on the enclosed Geotechnical Map, Plate 1.

Bulk, relatively undisturbed and Standard Penetration Test (SPT) samples were obtained at selected depths within the exploratory borings for subsequent laboratory testing. Relatively undisturbed samples were obtained using a 3-inch O.D., 2.5-inch I.D., California split-spoon soil sampler lined with brass rings. SPT samples were obtained from the borings using a standard, unlined SPT soil sampler. During each sampling interval, the sampler was driven 12 or 18 inches with successive drops of a 140-pound automatic hammer falling 30 inches. The number of blows required to advance the sampler was recorded for each six inches of advancement. The total blow count for the lower 12 inches of advancement per soil sample is recorded on the exploration log. Samples were placed in sealed containers or plastic bags and transported to our laboratory for analyses. The borings were backfilled with auger cuttings upon completion of sampling.

Upon completion of drilling, one additional boring was drilled approximately 10 feet away from Boring B-2 in order to install 3-inch-diameter casing for subsequent percolation testing. Well screens were installed from near the bottom of the borings to ground surface. The annular space of the well screen sections were filled with #3 Monterey sand for depths covering the extent of our testing. The remaining annular space was then backfilled with native soils. Subsequent to completion of well installation, the casings were then filled with water until the minimum volume of water was achieved for presoaking the test wells as required by test method USBR 7300-89.

Percolation Testing

Percolation testing was performed on May 6, 2016, in general conformance with the constant-head test procedures outlined in the referenced Well Permeameter Method (USBR 7300-89). A water hose attached to a water truck was connected to an inline flow meter to measure the water flow. The flow meter is capable of measuring flow rates up to 10 gallons per minute and as low as 0.1 gallons per minute. A valve was connected in line with the flow meter to control the flow rate. A filling hose was used to connect the flow meter and the test wells. Water was introduced by the filling hose near the bottom of the test wells. A water level meter with 1/100-foot divisions was used to measure the depths to water surface from the top of well casings.

Flow to the wells was terminated upon either completion of testing of all the pre-determined water levels or the flow rate reached the maximum capacity of the flow meter. Measurements obtained during the percolation testing are provided on Plate C-1.

Laboratory Testing

Selected soil samples of representative earth materials were tested to assist in the formulation of conclusions and recommendations presented in this report. Tests consisted of grain-size analysis. Laboratory testing relevant to percolation characteristics are presented in Appendix B.

ANALYSIS OF DATA

Subsurface Conditions

Soil materials encountered at the site consist of terrace deposits covered by a minor thickness of artificial fill. The artificial fills encountered consist of brown to red-brown, moist, medium stiff sandy clay with trace gravel. The thickness of artificial fill materials measured about 12 to 18 inches. However, artificial fill materials of greater thickness are anticipated to exist beneath portions of the site, particularly in areas of structures and as backfill in underground utility trenches.

Terrace deposits were encountered below the artificial fills to the maximum depth explored, 51.5 feet below existing ground surfaces. The upper 2 to 3 feet of the terrace deposits consists of red-brown sandy clay that is generally damp to moist and very stiff. Below 3 feet, the terrace deposits consists of interlayered sands, silty sands, and sandy silts to a depth of about 15 feet. Below a depth of 15 feet, the materials generally consisted of silty sands. These materials were light red-brown, yellow brown, gray, and light gray, dry to moist and medium dense to very dense/stiff to very stiff.

A more detailed description of the interpreted soil profile at the boring locations, based upon the borehole cuttings and soil samples, are presented in Appendix A. The stratigraphic descriptions in the logs represent the predominant materials encountered and relatively thin, often discontinuous layers of different material may occur within the major divisions.

Ground Water

Groundwater was not encountered during this firm's subsurface exploration to a maximum depth of 51.5 feet below the existing ground surface. A review of the CDMG Seismic Hazard Zone Report 03 indicates that historical high groundwater levels for the general site area is greater than 30 feet below the existing ground surface.

We performed research on available groundwater well data in the general area. We identified 4 wells in proximity to the site that provided long-term monitoring data. The data was obtained from the California Department of Water Resources. The data spans a period of time from 1982 to 2011 (29 years). The depth to groundwater has generally dropped over this time frame and has always remained below a depth of 50 feet (not counting some questionable data points obtained in one well. Plots of the well data and a map indicating the locations of the wells are provided in Appendix D. Based on this data, we conclude that groundwater is unlikely to rise above a depth of 50 feet during the lifespan of the project.

Percolation Data

Analyses were performed to evaluate permeability using the flow rate obtained at the end of the constant-head stage of field percolation testing. These analyses were performed in accordance with the procedures provided in the referenced USBR 7300-89. The procedure essentially uses a closed-form solution to the percolation out of a small-diameter well.

Using the USBR method, we calculated a composite permeability value for the head condition maintained in the well. The results are summarized in Table 1 below and the supporting analyses are included in Appendix C, Plate C-2.

TABLE 1
Summary of Back-Calculated Permeability Coefficient

Location	Total Depth of Well (ft)	Depth to Water in Well (ft)	Height of Water in Well (ft)	Static Flow Rate (gal./min.)	Estimated Permeability, k_s (in/hr.)
P-1 (B-2)	24.6	20	4.6	4.5	7.59

Design of Dry Well

Infiltration in a dry well was modeled using the software Seep/W, version 2007, by Geo-Slope International. The program allows for modeling of both partially-saturated and saturated porous medium using a finite element approach to solve Darcy's Law. The program can evaluate both steady-state and transient flow in planer and axisymmetric cases. Boundaries of the model can be identified with various conditions including fix total head, fix pressure head, fix flow rate, and head

as a function of flow. Soil conductivity properties can be modeled with either Fredlund et al (1994), Green and Corey (1971), or Van Genuchten (1980). The Van Genuchten parameters were selected for use in our models and were based on test results of particle-size analyses and estimated in-place densities. The saturated conductivities for the infiltration zones are set to the values obtained from back-calculation of the percolation tests.

A model was setup with two zones of material to represent the general soil profile. The conductivity of zone 1 (Material No. 1) was set to highly restrict water flow from this zone. Based on our testing, this zone would actually provide significant lateral infiltration but interbeds of fine-grained soils would tend to restrict the downward movement of water. Therefore, the infiltration of this upper zone was ignored. The conductivity of zone 2 (Material No. 2) was based on the back-analyzed percolation test and represents the infiltration zone. A summary of the well profile is provided in Table 2.

TABLE 2
Summary of Characteristic Curve Parameters

Material No.	Depth (ft.)	USCS	Ks (in/hr)	Van Genuchten Parameters				
				a (1/cm)	n	m	Sat. Water Content	Residual Water Content
1	0-15	Impermeable	0.001	0.004	1.11	0.061	0.55	0.01
2	>15	SM	7.0	0.037	1.42	0.29	0.25	0.025

Steady state analysis was performed to estimate the maximum inflow that the wells could accommodate. The water head was set at a depth of 5 feet below ground level. Using a well that is 4 feet in diameter and 40 feet in depth, we obtain a static total flow of 0.35 ft³/sec. An effective percolation surface area (wetted surface) of 327 ft² was determined for the zone from 15 to 40 feet. The static flow divided by the effective surface area (Q/A) would then yield an average infiltration rate of 46 in/hr. A Plot depicting the resulting pressure head contours and flow vectors for the model are provided on Plate C-3 in Appendix C.

To evaluate the time required to empty the wells once no more water is introduced, the models were reanalyzed with a variable head condition that was dependent upon the volume of water leaving the wells. As water infiltrates into the surrounding soil, the volume of water remaining in the well is reduced as well as the resulting water head. A graph of the well head versus exit volume for a depth of 40 feet is provided in Figure 2. The function assumes a void ratio of 0.4 within the zones occupied by gravel. If some other well configuration is used, then the analyses may require updating. The model is based on a 40 foot-deep well with a 6 foot outer diameter and 4 foot inner chamber diameter in the upper 15 feet and a 4 foot diameter in below 15 feet. Gravel is assumed to occupy the annular space between the outer and inner diameters. A more detailed model of the dry well designs can be found on Plate 2.

Analysis was performed as a transient case over a total time of 2 hours. The condition in the model was evaluated in several increments of time over the total duration. The water was completely evacuated in 1.2 hours. Plots depicting the resulting pressure head contours and flow vectors are provided in Appendix C on Plates C-4 through C-8. A plot of time versus water height in the well is shown on Figure 3.

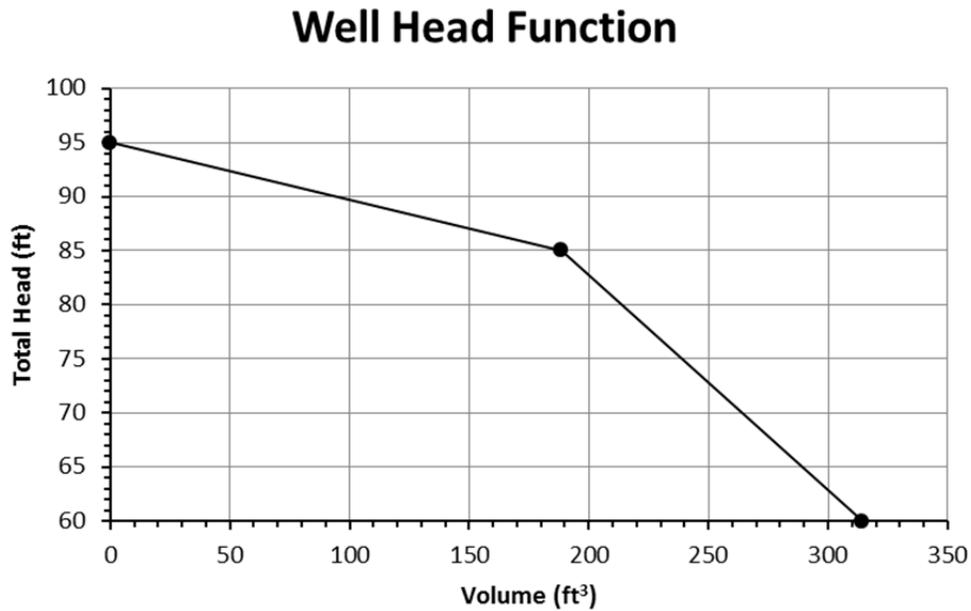


FIGURE 2

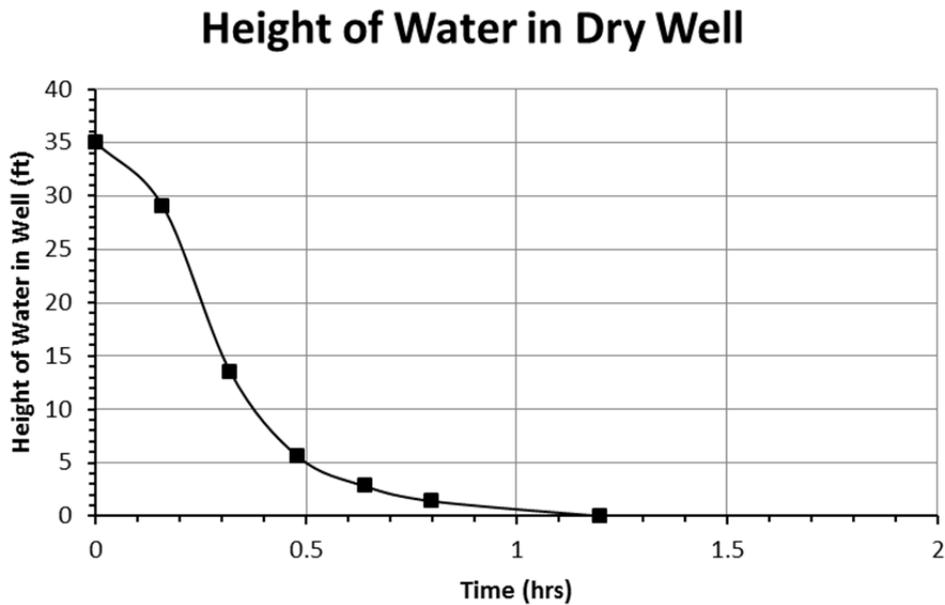


FIGURE 3

CONCLUSIONS AND RECOMMENDATIONS

General

Results of our work indicate a storm water disposal system consisting of either a dry well or chamber system is feasible at the site. The following provides conclusions and recommendations pertaining to each option.

Dry Well

Based on results of percolation testing and analyses, the percolation rate for a 4-foot-diameter dry well with a total depth of at least 40 feet may utilize an unfactored peak flow rate of 0.35 ft³/sec. At this flow rate, an average measured peak infiltration rate of 46 in/hr may be achieved by the dry well system when applied to the wetted surface area from 15 to 40 feet. Based on this average infiltration rate, the minimum required rate as required by the Santa Ana Regional Water Quality Control Board is achieved.

An appropriate factor of safety should be applied to these values as required by the appropriate governmental authority. The project geotechnical consultant should observe the drilling to confirm the intent of this report.

The Regional Water Quality Boards generally requires the dry wells to empty within 72 hours. From our analyses, a 4-foot-diameter dry well with depth of 40 feet will empty in 1.2 hours. Therefore this maximum value is met.

The entire site is suitable for infiltration by a dry well. Should you require multiple dry wells across the site, the wells should be spaced at least 50 feet center to center to avoid cross influence. The wells should be placed at least 10 feet from any residential structure or property line.

The actual flow capacity of the dry well could be more or less than the estimated value. As such, provisions should be made to accommodate excess flow quantities in the event the dry well does not infiltrate the anticipated amount. The design also assumes that sediments will be removed from the inflowing water. Sediments that are allowed to enter the dry well will tend to degrade the flow capacity by plugging up the infiltration surfaces.

In general, the dry well may consist of a concrete inner chamber surrounded by ½-inch open graded gravel. The concrete chamber should have perforations sized to prevent piping of the gravel into the chamber. A minimum of 6 inches of gravel should be provided around the inner chamber. The gravel should terminate no closer than 5 feet from the ground surface. The remaining space around and above the chamber should be backfilled with 2-sack slurry. A general diagram of a dry well is provided on Plate 2.

The dry well shaft may be adequately stable under temporary construction conditions for uncased drilling. However, most of the site soils are very granular and will be prone to sloughing and caving

shortly after drilling are even as drilling advances. The contractor should be prepared to provide casing to maintain stability of the shaft in the event of caving. Workers should not enter the shaft unless the excavation is laid back or shored in accordance with OSHA requirements. The placement and compaction of backfill materials, including the gravel, should be observed by the project geotechnical consultant.

Chamber System

Conditions at the site are suitable for infiltration by a shallow chamber system provided the system infiltrates at a depth of 15 feet or more. If the chambers do not extend to a depth of 15 feet, the area below the chambers can be excavated and refilled with a Class II permeable filter mix per Caltrans or $\frac{3}{4}$ crushed rock wrapped in filter fabric such as Mirafi 140N or equivalent approved by the geotechnical consultant.

Chambers may be designed based on a “measured” infiltration rate of 7 inches per hour. A factor of safety should be applied to this value to obtain the “design” infiltration rate in accordance with the agency requirements.

Chambers should be placed to provide a minimum setback from residential structures and property lines a distance of at least 10 feet. The sidewalls of the excavations for chambers should be covered with an impermeable membrane if they will be placed within 20 feet of a residential structure to limit lateral flow of water. This requirement includes portions of the excavation that are removed and replaced with permeable filter mix. The membrane should be lapped and sealed at all joints.

LIMITATIONS

This report is based on the geotechnical data as described herein. The materials encountered in our boring excavations and utilized in our laboratory testing for this investigation are believed representative of the project area, and the conclusions and recommendations contained in this report are presented on that basis. However, soil and bedrock materials can vary in characteristics between points of exploration, both laterally and vertically, and those variations could affect the conclusions and recommendations contained herein. As such, observations by a geotechnical consultant during the construction phase of the storm water infiltration systems are essential to confirming the basis of this report.

This report has been prepared consistent with that level of care being provided by other professionals providing similar services at the same locale and time period. The contents of this report are professional opinions and as such, are not to be considered a guaranty or warranty.

This report should be reviewed and updated after a period of one year or if the site ownership or project concept changes from that described herein.

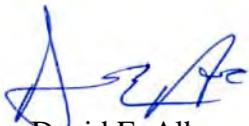
This report has been prepared for the exclusive use of **Sheldon Development, LLC** to assist the project consultants in the design of the proposed development. This report has not been prepared for use by parties or projects other than those named or described herein. This report may not contain sufficient information for other parties or other purposes.

This report is subject to review by the controlling governmental agency.

We appreciate this opportunity to be of service to you. If you should have any questions regarding the contents of this report, please do not hesitate to call.

Sincerely,

ALBUS-KEEFE & ASSOCIATES, INC.



David E. Albus
Principal Engineer
G.E. 2455



- Enclosures:
- Plate 1- Geotechnical Map
 - Plate 2 – Diagram of Dry Well
 - Appendix A - Exploratory Logs
 - Appendix B - Laboratory Testing
 - Appendix C - Percolation Testing and Analyses

REFERENCES

Publications and Reports

CDMG, "Seismic Hazard Zone Report for the El Monte 7.5-Minute Quadrangle, Los Angeles County, California", Seismic Hazard Zone Report 024, (1998).

Procedure for Performing Field Permeability Testing by the Well Permeameter Method, by United States Department of The Interior, Bureau of Reclamation (USBR 7300-89).

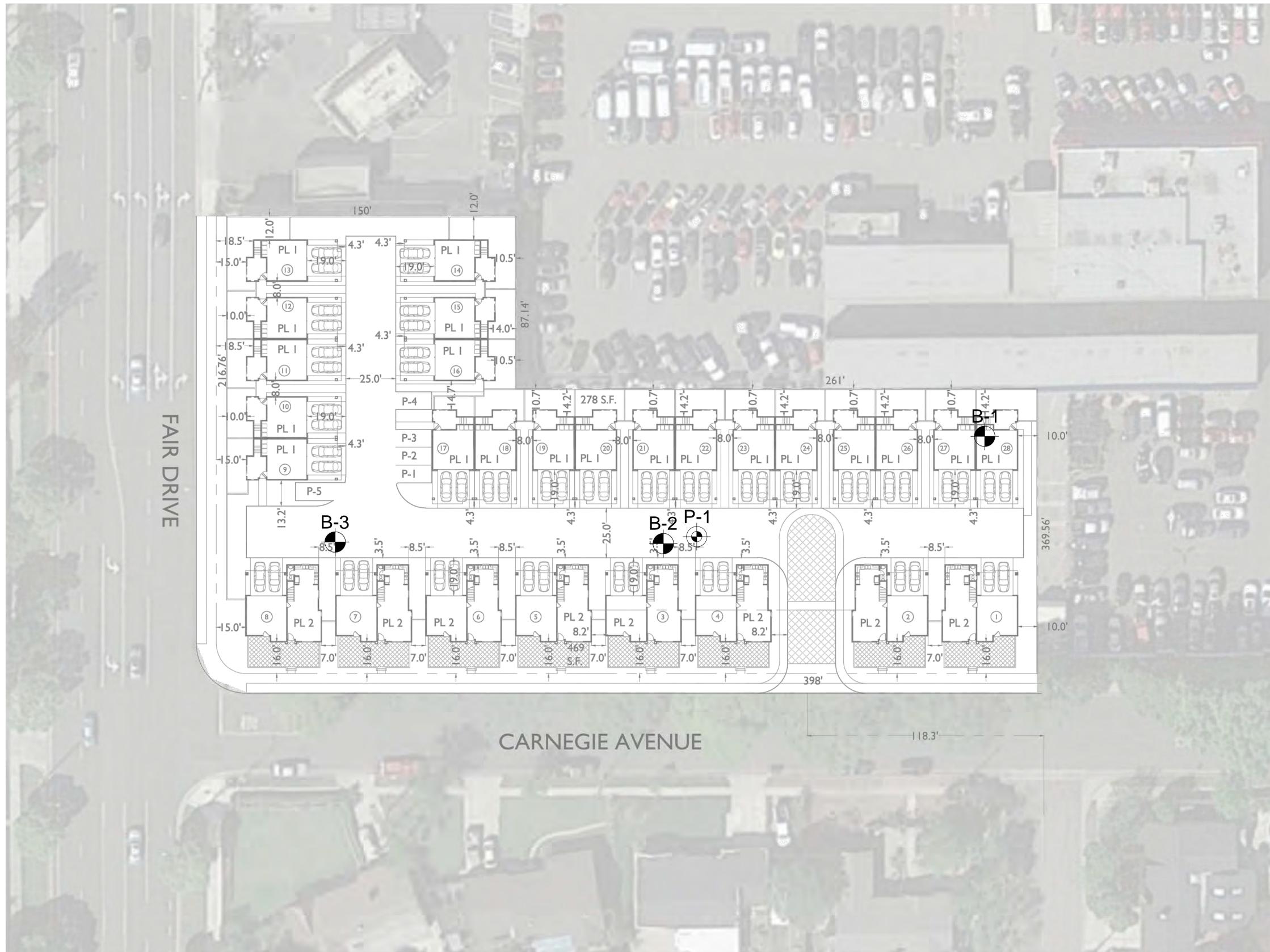
GEOTECHNICAL MAP

Job No.: 2495.00 Date: 06/10/16 Plate: 1

EXPLANATION

(Locations Approximate)

- B-3**
 - Exploratory Boring
- P-1**
 - Percolation Well



SITE PLAN SUMMARY

OWNER: SHELDON DEVELOPMENT, LLC.
 901 DOVE STREET, SUITE 230
 NEWPORT BEACH, CA 92660
 PHONE: (949)777-9400

SITE ADDRESS: FAIR DRIVE AT CARNEGIE

PROPOSED UNITS: 28 HOMES
 20 - 3 STORY DUPLEX
 8 - 2 STORY DETACHED

LOT AREA: 72,310 S.F. (1.66 ACRES)

DENSITY: 16.25 UNITS PER ACRE

SITE SUMMARY:
 BLDG FOOTPRINTS: 21,060 S.F. (31.5%)
 PRIV. STREETS/DRIVES: 24,150 S.F. (29.2%)
 OPEN SPACE: 22,808 S.F. (31.5% AT GRADE)
 BALCONIES: 1,080 S.F. (2ND FLOOR)
 ROOF DECKS: 8,000 S.F.
 TOTAL OPEN SPACE: 31,888 S.F. (44.0%)

PLAN SUMMARY:		LIVABLE AREA
3 STORY - 4 BDRM		
PLAN 1	1ST FLR	157 S.F.
	2ND FLR	897 S.F.
	3RD FLR	809 S.F.
	TOTAL LIVABLE	1,863 S.F.
	GARAGE	471 S.F.
	BALCONY	54 S.F.
	ROOF DECK	400 S.F.
3 STORY - 3 BDRM		
PLAN 2	1ST FLR	609 S.F.
	2ND FLR	1,174 S.F.
	3RD FLR	237 S.F.
	TOTAL LIVABLE	2,020 S.F.
	GARAGE	453 S.F.

PARKING SUMMARY:
 REQUIRED PARKING = 20 UNITS X 4 STALLS/UNIT = 80 STALLS
 8 UNITS X 4 STALLS/UNIT = 32 STALLS
 112 STALLS

PLAN 1 2 CAR ATTACHED GARAGE X 20 UNITS = 40 STALLS
 PLAN 2 2 CAR ATTACHED GARAGE X 8 UNITS = 16 STALLS
 GUEST PRIVATE DRIVE STALLS = 56 STALLS
 GUEST ADD'L OPEN UNASSIGNED STALLS = 5 STALLS
 117 STALLS

BUILDING HEIGHT: 3 STORIES, 44'-0" MAXIMUM HEIGHT

CARNEGIE AVENUE - COSTA MESA - 28 HOMES

SITE PLAN

MAXWELL® IV DRAINAGE SYSTEM DETAIL AND SPECIFICATIONS

ITEM NUMBERS

1. Manhole Cone - Modified Flat Bottom.
2. Moisture Membrane - 6 Mil. Plastic. Applies only when native material is used for backfill. Place membrane securely against eccentric cone and hole sidewall.
3. Bolted Ring & Grate - Diameter as shown. Clean cast iron with wording "Storm Water Only" in raised letters. Bolted in 2 locations and secured to cone with mortar. Rim elevation $\pm 0.02'$ of plans.
4. Graded Basin or Paving (by Others).
5. Compacted Base Material - 1-Sack Slurry except in landscaped installations with no pipe connections.
6. PureFlo® Debris Shield - Rolled 16 ga. steel X 24" length with vented anti-siphon and Internal .265" Max. SWO flattened expanded steel screen X 12" length. Fusion bonded epoxy coated.
7. Pre-cast Liner - 4000 PSI concrete 48" ID. X 54" OD. Center in hole and align sections to maximize bearing surface.
8. Min. 6' \emptyset Drilled Shaft.
9. Support Bracket - Formed 12 Ga. steel. Fusion bonded epoxy coated.
10. Overflow Pipe - Sch. 40 PVC mated to drainage pipe at base seal.
11. Drainage Pipe - ADS highway grade with TRI-A coupler. Suspend pipe during backfill operations to prevent buckling or breakage. Diameter as noted.
12. Base Seal - Geotextile or concrete slurry.
13. Rock - Washed, sized between 3/8" and 1-1/2" to best complement soil conditions.
14. FloFast® Drainage Screen - Sch. 40 PVC 0.120" slotted well screen with 32 slots per row/ft. Diameter varies 120" overall length with TRI-B coupler.
15. Min. 4' \emptyset Shaft - Drilled to maintain permeability of drainage soils.
16. Fabric Seal - U.V. resistant geotextile - to be removed by customer at project completion.
17. Absorbent - Hydrophobic Petrochemical Sponge. Min. to 128 oz. capacity.
18. Freeboard Depth Varies with inlet pipe elevation. Increase settling chamber depth as needed to maintain all inlet pipe elevations above overflow pipe inlet.
19. Optional Inlet Pipe (Maximum 4", by Others). Extend moisture membrane and compacted base material or 1 sack slurry backfill below pipe invert.

The referenced drawing and specifications are available on CAD either through our office or web site. This detail is copyrighted (2004) but may be used as is in construction plans without further release. For information on product application, individual project specifications or site evaluation, contact our Design Staff for no-charge assistance in any phase of your planning.

CALCULATING MAXWELL IV REQUIREMENTS

The type of property, soil permeability, rainfall intensity and local drainage ordinances determine the number and design of Maxwell Systems. For general applications draining retained stormwater, use one standard **MaxWell IV** per the instructions below for up to 3 acres of landscaped contributory area, and up to 1 acre of paved surface. For larger paved surfaces, subdivision drainage, nuisance water drainage, connecting pipes larger than 4" \emptyset from catch basins or underground storage, or other demanding applications, refer to our **MaxWell® Plus** System. For industrial drainage, including gasoline service stations, our **Envibro® System** may be recommended. For additional considerations, please refer to "Design Suggestions For Retention And Drainage Systems" or consult our Design Staff.

COMPLETING THE MAXWELL IV DRAWING

To apply the **MaxWell IV** drawing to your specific project, simply fill in the blue boxes per instructions below. For assistance, please consult our Design Staff.

ESTIMATED TOTAL DEPTH

The Estimated Total Depth is the approximate depth required to achieve 10 continuous feet of penetration into permeable soils. Torrent utilizes specialized "crowd" equipped drill rigs to penetrate difficult, cemented soils and to reach permeable materials at depths up to **180 feet**. Our extensive database of drilling logs and soils information is available for use as a reference. Please contact our Design Staff for site-specific information on your project.

SETTLING CHAMBER DEPTH

On MaxWell IV Systems of over 30 feet overall depth and up to 0.25cfs design rate, the **standard** Settling Chamber Depth is **18 feet**. For systems exposed to greater contributory area than noted above, extreme service conditions, or that require higher design rates, chamber depths up to 25 feet are recommended.

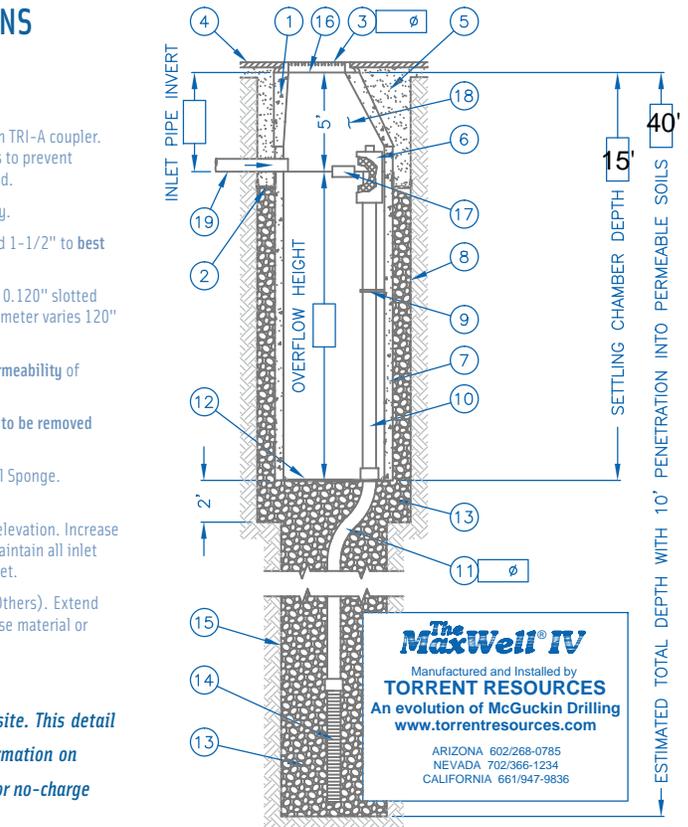
OVERFLOW HEIGHT

The Overflow Height and Settling Chamber Depth determine the effectiveness of the settling process. The higher the overflow pipe, the deeper the chamber, the greater the settling capacity. For normal drainage applications, an overflow height of **13 feet** is used with the standard settling chamber depth of **18 feet**. Sites with higher design rates than noted above, heavy debris loading or unusual service conditions require greater settling capacities

TORRENT RESOURCES INCORPORATED

1509 East Elwood Street, Phoenix Arizona 85040-1391
phone 602-268-0785 fax 602-268-0820
Nevada 702-366-1234

AZ Lic. ROC070465 A, ROC047067 B-4; ADWR 363
CA Lic. 528080 A, C-42, HAZ - NV Lic. 0035350 A - NM Lic. 90504 GF04



AZ Lic. ROC070465 A, ROC047067 B-4, ADWR 363
CA Lic. 528080 A, C-42, HAZ
NV Lic. 0035350 A - NM Lic. 90504 GF04
U.S. Patent No. 4,923,330 - TM Trademark 1974, 1990, 2004

MaxWell® IV
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TORRENT RESOURCES
An evolution of McGuckin Drilling
www.torrentresources.com
ARIZONA 602/268-0785
NEVADA 702/366-1234
CALIFORNIA 661/947-9836

DRAINAGE PIPE

This dimension also applies to the **PureFlo®** Debris Shield, the **FloFast®** Drainage Screen, and fittings. The size selected is based upon system design rates, soil conditions, and the need for adequate venting. Choices are 6", 8", or 12" diameter. Refer to "Design Suggestions for Retention and Drainage Systems" for recommendations on which size best matches your application.

BOLTED RING & GRATE

Standard models are quality cast iron and available to fit 24" \emptyset or 30" \emptyset manhole openings. All units are bolted in two locations with wording "Storm Water Only" in raised letters. For other surface treatments, please refer to "Design Suggestions for Retention and Drainage Systems."

INLET PIPE INVERT

Pipes up to 4" in diameter from catch basins, underground storage, etc. may be connected into the settling chamber. Inverts deeper than 5 feet will require additional settling chamber depth to maintain effective overflow height.

TORRENT RESOURCES (CA) INCORPORATED

phone 661-947-9836
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PLATE 2



APPENDIX A
EXPLORATORY LOGS

EXPLORATION LOG

Project:		Location:
Address:		Elevation:
Job Number:	Client:	Date:
Drill Method:	Driving Weight:	Logged By:

Depth (feet)	Lith- ology	Material Description	Water	Samples			Laboratory Tests		
				Blows Per Foot	Core	Bulk	Moisture Content (%)	Dry Density (pcf)	Other Lab Tests
		<u>EXPLANATION</u>							
		Solid lines separate geologic units and/or material types.							
5		Dashed lines indicate unknown depth of geologic unit change or material type change.							
		Solid black rectangle in Core column represents California Split Spoon sampler (2.5in ID, 3in OD).			■				
		Double triangle in core column represents SPT sampler.			▲▼				
10		Solid black rectangle in Bulk column represents large bag sample.				■			
		<u>Other Laboratory Tests:</u> Max = Maximum Dry Density/Optimum Moisture Content EI = Expansion Index SO4 = Soluble Sulfate Content DSR = Direct Shear, Remolded DS = Direct Shear, Undisturbed SA = Sieve Analysis (1" through #200 sieve) Hydro = Particle Size Analysis (SA with Hydrometer) 200 = Percent Passing #200 Sieve Consol = Consolidation SE = Sand Equivalent Rval = R-Value ATT = Atterberg Limits							
15									
20									

EXPLORATION LOG

Project: 440 Fair Drive, Costa Mesa		Location: B-1
Address: 440 Fair Dr, Costa Mesa, CA 92626		Elevation: 70
Job Number: 2495.00	Client: Sheldon Development, LLC	Date: 5/6/2016
Drill Method: Hollow-Stem Auger	Driving Weight: 140 lbs / 30 in	Logged By: BJP

Depth (feet)	Lithology	Material Description	Water	Samples		Laboratory Tests		
				Blows Per Foot	Core Bulk	Moisture Content (%)	Dry Density (pcf)	Other Lab Tests
		<u>Asphalt Concrete (AC):</u> 5.5 inches AC / No base						EI SO4 ATT RVal
		ARTIFICIAL FILL (Af) <u>Sandy Clay (CL):</u> Brown to red-brown, moist, medium stiff, fine grained sand, trace coarse grained sand and gravel		21		15.3	88	
5		TERRACE DEPOSITS (Qt) <u>Sandy Clay (CL):</u> Red-brown, moist, very stiff, fine grained sand, trace medium to coarse grained sand and gravel, some blocky ped development, some pinhole pores		15		6.6	106.6	Max DS
		<u>Clayey Sand/Silty Sand (SC/SM):</u> Light red-brown to yellow-brown, damp, medium dense, fine to medium grained sand, trace coarse grained sand and gravel, trace pores		10				
		<u>Sand (SP):</u> Light red-brown, damp, medium dense, fine to medium grained sand, some coarse grained sand and gravel, sample disturbed		21				
10		<u>Sand (SP):</u> Light red-brown, damp, medium dense, fine to medium grained sand, some coarse grained sand and gravel, sample disturbed		31				
		@ 8', no recovery						
		<u>Silt with some Sand (ML):</u> Gray, moist, very stiff, fine grained sand, some orange oxidation staining						
15		<u>Sandy Silt (ML):</u> Gray, moist, very stiff, fine grained sand, some orange oxidation staining		23		10	115.5	
		<u>Silty Sand (SM):</u> Light gray, dry to damp, dense, fine grained sand, some orange oxidation staining						
20				57		2.9	91	
		Total Depth: 21 feet No groundwater Backfilled with soil cuttings and capped with AC cold patch						

EXPLORATION LOG

Project: 440 Fair Drive, Costa Mesa		Location: B-2
Address: 440 Fair Dr, Costa Mesa, CA 92626		Elevation: 70
Job Number: 2495.00	Client: Sheldon Development, LLC	Date: 5/6/2016
Drill Method: Hollow-Stem Auger	Driving Weight: 140 lbs / 30 in	Logged By: BJP

Depth (feet)	Lithology	Material Description	Water	Samples			Laboratory Tests		
				Blows Per Foot	Core	Bulk	Moisture Content (%)	Dry Density (pcf)	Other Lab Tests
		<u>Asphalt Concrete (AC):</u> 4.5 inches AC / No base							
		ARTIFICIAL FILL (Af) <u>Sandy Clay (CL):</u> Brown to red-brown, moist, medium stiff, fine grained sand, trace coarse grained sand and gravel		40			6.6	119.3	Consol
5		TERRACE DEPOSITS (Qt) <u>Sandy Clay (CL):</u> Red-brown, damp to moist, hard, fine grained sand, trace medium to coarse grained sand and gravel, some blocky ped development, some pores		19			6.7	104.4	Consol
		<u>Clayey Sand/Silty Sand (SC/SM):</u> Light red-brown to yellow-brown, damp, medium dense, fine grained sand, some pinhole pores		10			2.4	98.1	
10		@ 6', becomes loose, dry to damp, increased fine grained sand, some medium grained sand, trace clay		43			1.9	Dist.	
		<u>Sand (SP):</u> Light red-brown to tan, dry, dense, fine to coarse grained sand, some gravel							
		<u>Sandy Silt (ML):</u> Gray, moist, hard, fine grained sand, some orange oxidation staining, some pinhole pores							
15				74			3.9	96.5	
		<u>Silty Sand/Sand with Silt (SM/SP-SM):</u> Light gray, dry to damp, very dense, fine grained sand, some orange oxidation staining							
20		@ 20', becomes damp, dense, decreased silt		44			4.3	95.1	SA Hydro

EXPLORATION LOG

Project: 440 Fair Drive, Costa Mesa		Location: B-2
Address: 440 Fair Dr, Costa Mesa, CA 92626		Elevation: 70
Job Number: 2495.00	Client: Sheldon Development, LLC	Date: 5/6/2016
Drill Method: Hollow-Stem Auger	Driving Weight: 140 lbs / 30 in	Logged By: BJP

Depth (feet)	Lithology	Material Description	Water	Samples		Laboratory Tests		
				Blows Per Foot	Core	Bulk	Moisture Content (%)	Dry Density (pcf)
30	@ 25', becomes very dense, increased silt, trace gravel			43	▲			
35	@ 30', same			74	▲			
40	@ 35', occasional 1-inch sand layers			64	▲			
45	@ 40', becomes damp to moist, fine to medium grained sand, decreased silt			54	▲			
	<u>Silty Sand/Sandy Silt (SM/ML):</u> Gray, moist, dense/hard, fine grained sand, some orange oxidation staining							
45	@ 45', becomes gray to olive-gray			36	▲			

EXPLORATION LOG

Project: 440 Fair Drive, Costa Mesa		Location: B-2
Address: 440 Fair Dr, Costa Mesa, CA 92626		Elevation: 70
Job Number: 2495.00	Client: Sheldon Development, LLC	Date: 5/6/2016
Drill Method: Hollow-Stem Auger	Driving Weight: 140 lbs / 30 in	Logged By: BJP

Depth (feet)	Lith- ology	Material Description	Water	Samples		Laboratory Tests		
				Blows Per Foot	Core	Bulk	Moisture Content (%)	Dry Density (pcf)
39		Total Depth: 51.5 feet No groundwater Backfilled with soil cuttings and capped with AC cold patch Perc. well set 10 feet offset						

EXPLORATION LOG

Project: 440 Fair Drive, Costa Mesa		Location: B-3
Address: 440 Fair Dr, Costa Mesa, CA 92626		Elevation: 70
Job Number: 2495.00	Client: Sheldon Development, LLC	Date: 5/6/2016
Drill Method: Hollow-Stem Auger	Driving Weight: 140 lbs / 30 in	Logged By: BJP

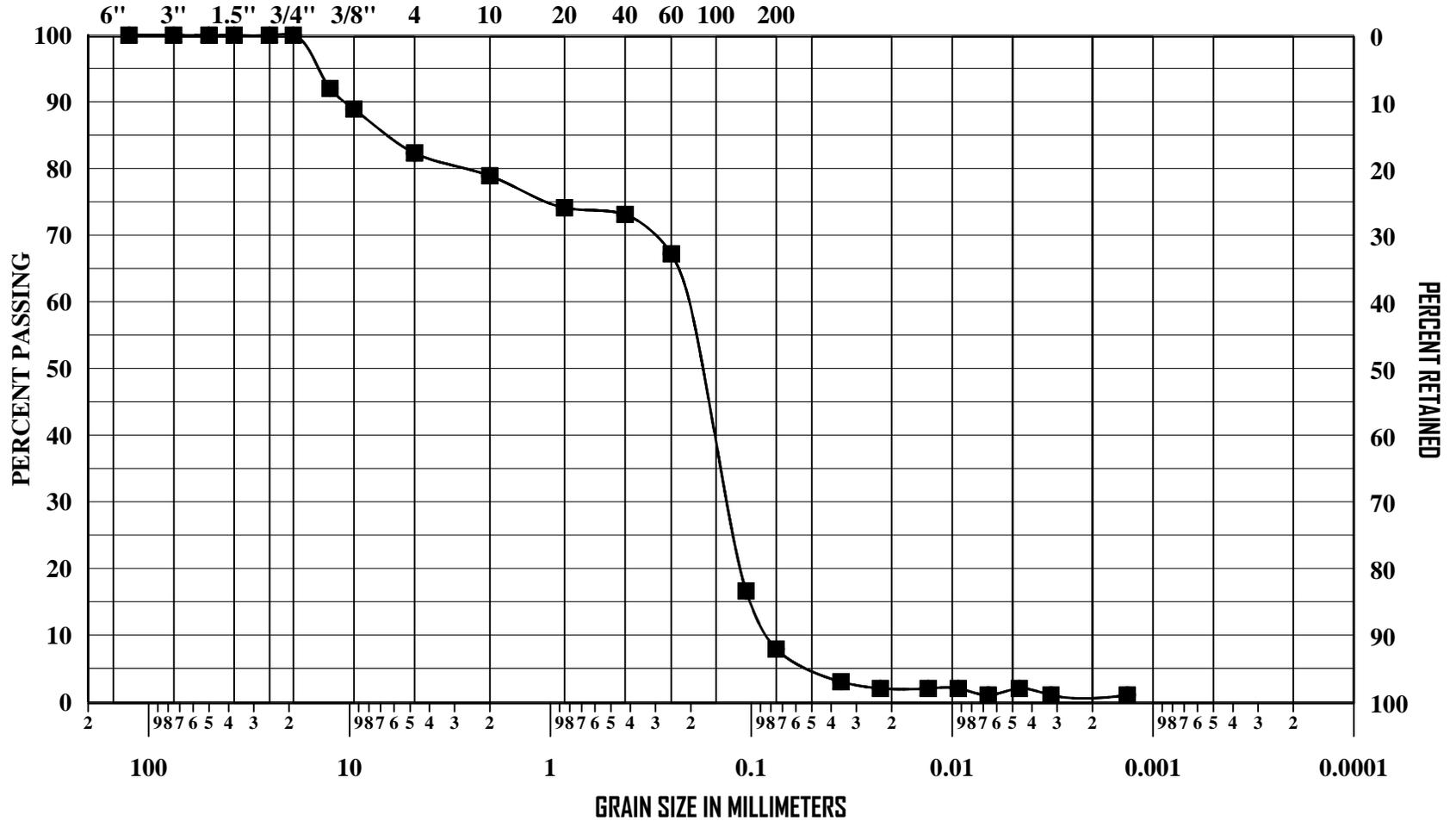
Depth (feet)	Lithology	Material Description	Water	Samples		Laboratory Tests		
				Blows Per Foot	Core	Bulk	Moisture Content (%)	Dry Density (pcf)
		<u>Asphalt Concrete (AC)</u> : 4.5 inches AC / No base						
		ARTIFICIAL FILL (Af) <u>Sandy Clay (CL)</u> : Brown to red-brown, moist, medium stiff, fine grained sand, trace coarse grained sand and gravel		35			12.4	118.3
5		TERRACE DEPOSITS (Qt) <u>Sandy Clay (CL)</u> : Red-brown, moist, very stiff, fine grained sand, trace medium to coarse grained sand and gravel, some blocky ped development, some pores and rootlets		38			7.3	112.7
		<u>Clayey Sand (SC)</u> : Light red-brown, damp to moist, medium dense, fine grained sand, some medium to coarse grained sand		20			6.3	Dist.
10		<u>Sand (SP)</u> : Yellow-brown, moist, medium dense, fine to coarse grained sand, some gravel, trace clay		26			10.7	111.3
		<u>Silty Sand (SM)</u> : Light red-brown, moist, medium dense, fine grained sand, some medium grained sand, some clay						
		<u>Silt with Sand (ML)</u> : Gray, moist, very stiff, fine grained sand, some orange oxidation staining						
15		<u>Silty Sand (SM)</u> : Light gray, moist, medium dense, fine grained sand, some orange oxidation staining		32			19.6	89.5
		<u>Sand (SP)</u> : Light red-brown to gray, dry to damp, very dense, fine to medium grained sand, trace coarse grained sand and gravel		70			2.9	99.6
		Total Depth: 21 feet No groundwater Backfilled with soil cuttings and capped with AC cold patch						

APPENDIX B
LABORATORY TESTING

UNIFIED SOIL CLASSIFICATION

COBBLES	GRAVEL		SAND			SILT AND CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

U.S. STANDARD SIEVE SIZES



LOCATION	SAMPLE	SYMBOL	LL	PI	CLASSIFICATION
B-2	20 feet	●————●			Sand with Silt (SP-SM)

ALBUS-KEEFE & ASSOCIATES, INC.
GEOTECHNICAL CONSULTANTS

GRAIN SIZE DISTRIBUTION

Job No: 2495.00

Plate No: B-1

APPENDIX C
PERCOLATION TESTING AND ANALYSES

INFILTRATION WELL DESIGN

Constant Head
 USBR 7300-89 Method
 J.N.: 2495.00
 Client: Sheldon Development
 Well No. P-1 (B-2)

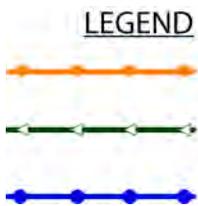
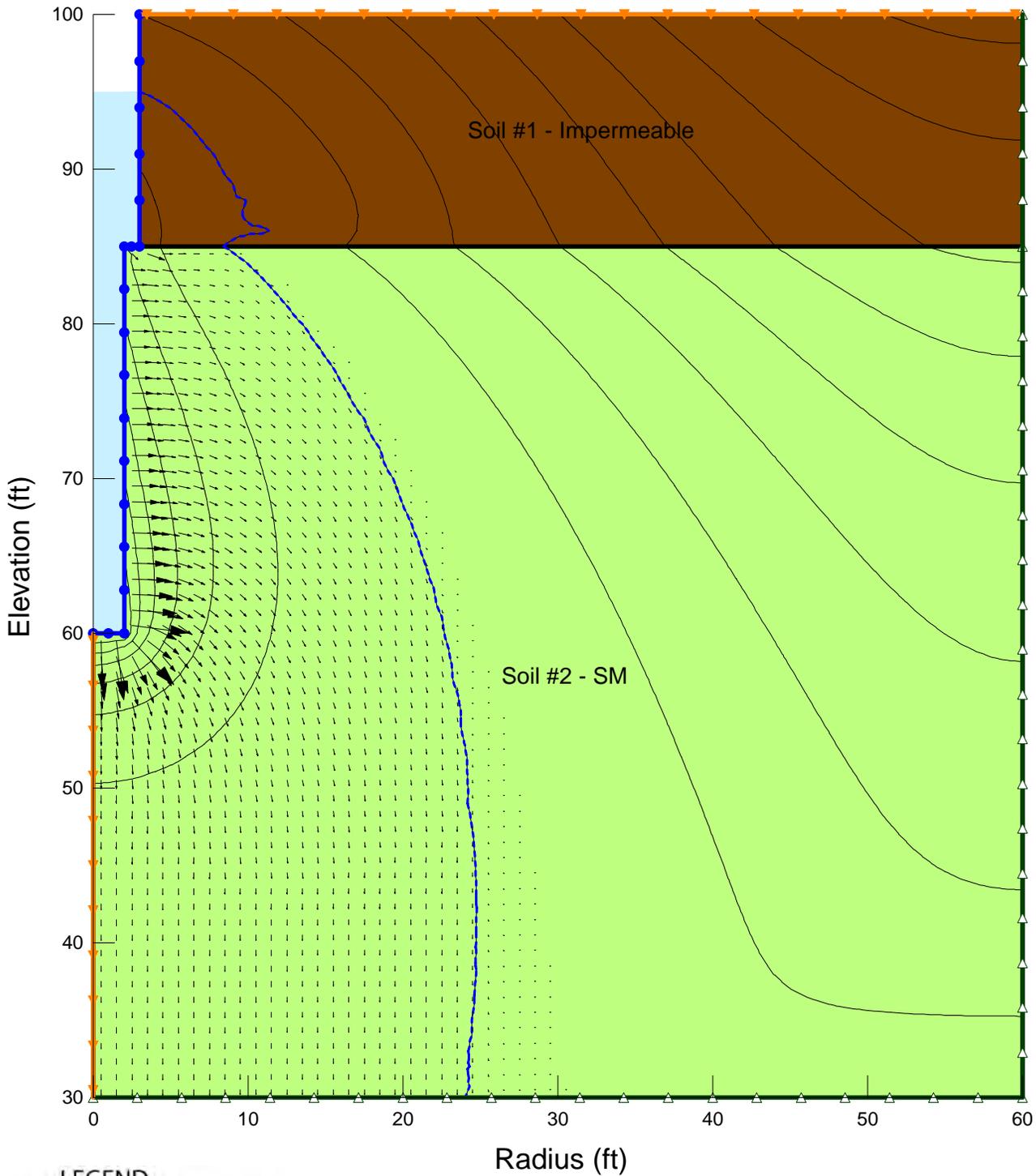
	Low Water Table	Condition 1	
	High Water Table & Water Below Bottom of Well	Condition 2	
	High water Table with Water Above the Well Bottom	Condition 3	
			Units:
Enter Condition (1, 2 or 3):		1	
Ground Surface to Bottom of Well (h_1):		24.6	feet
Depth to Water (h_2):		20	feet
Height of Water in the Well ($h_1-h_2=h$):		4.6	feet
Radius of Well (r):		4.0	Inches
Minimum Volume Required:		1209.6	Gal.
Discharge Rate of Water Into Well for Steady-State Condition (q):		4.5	Gal/min.
Temperature (T):		21	Celsius
(Viscosity of Water @ Temp. T) / (Viscosity of water @ 20° C) (V):		0.9647	ft ³ /min.
Unsaturated Distance Between the Water Surface in the Well and the			
Water table (T_u):			Ignore T_u
Factor of Safety:		1	
Coefficient of Permeability @ 20° C (k_{20}):		1.05E-02	ft/min.
Design k_{20}:		7.59	in./hr.
Design k_{20}:		15.18	ft./day

The presence or absence of a water table or impervious soil layer within a distance of less than three times that of the water depth in the well (measured from the water surface) will enable the water table to be classified as **Condition I, Condition II, Condition III.**

Low Water Table-When the distance from the water surface in the test well to the ground water table, or to an impervious soil layer which is considered for test purposes to be equivalent to a water table, is greater than three times the depth of water in the well, classify as **Condition I.**

High Water Table-When the distance from the water surface in the test well to the ground water table or to an impervious layer is less than three times the depth of water in the well, a high water table condition exists. Use **Condition II** when the water table or impervious layer is below the well bottom. Use **Condition III** when the water table or impervious layer is above the well bottom.

**STEADY STATE
FLOW ANALYSIS OF 40 ft DEEP, 4 ft DIAMETER DRY WELL**



Zero Flux

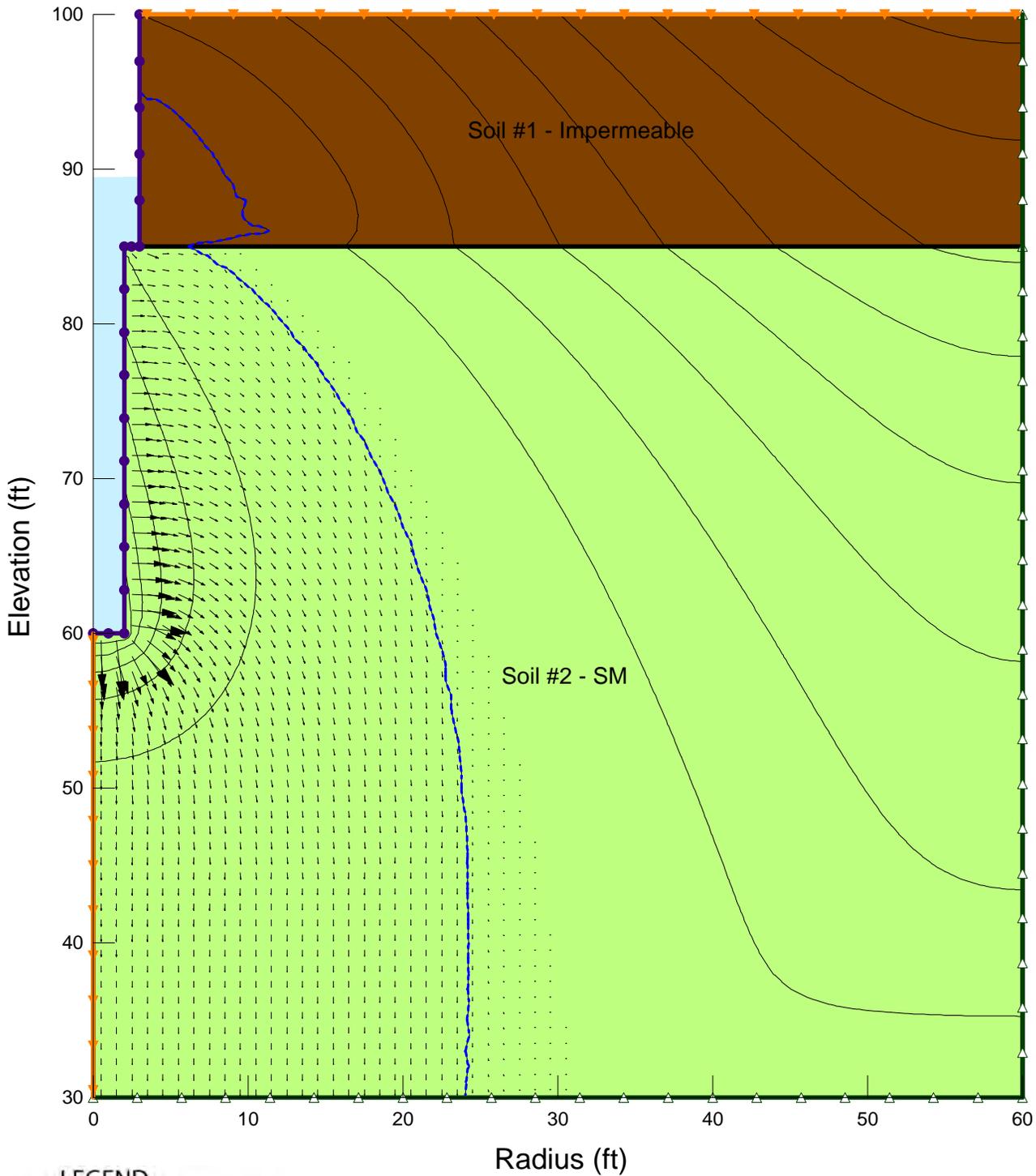
Potential Seepage Face

Fixed Total Head = 95'

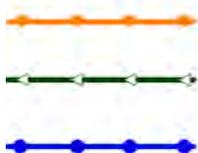
Contours are Pressure Head in Feet.

Arrows indicate direction of flow and relative magnitude of velocity.

VTCPUGPV'UTATE'VKO G? 2088'J QWTU
FLOW ANALYSIS OF 40 ft DEEP, 4 ft DIAMETER DRY WELL



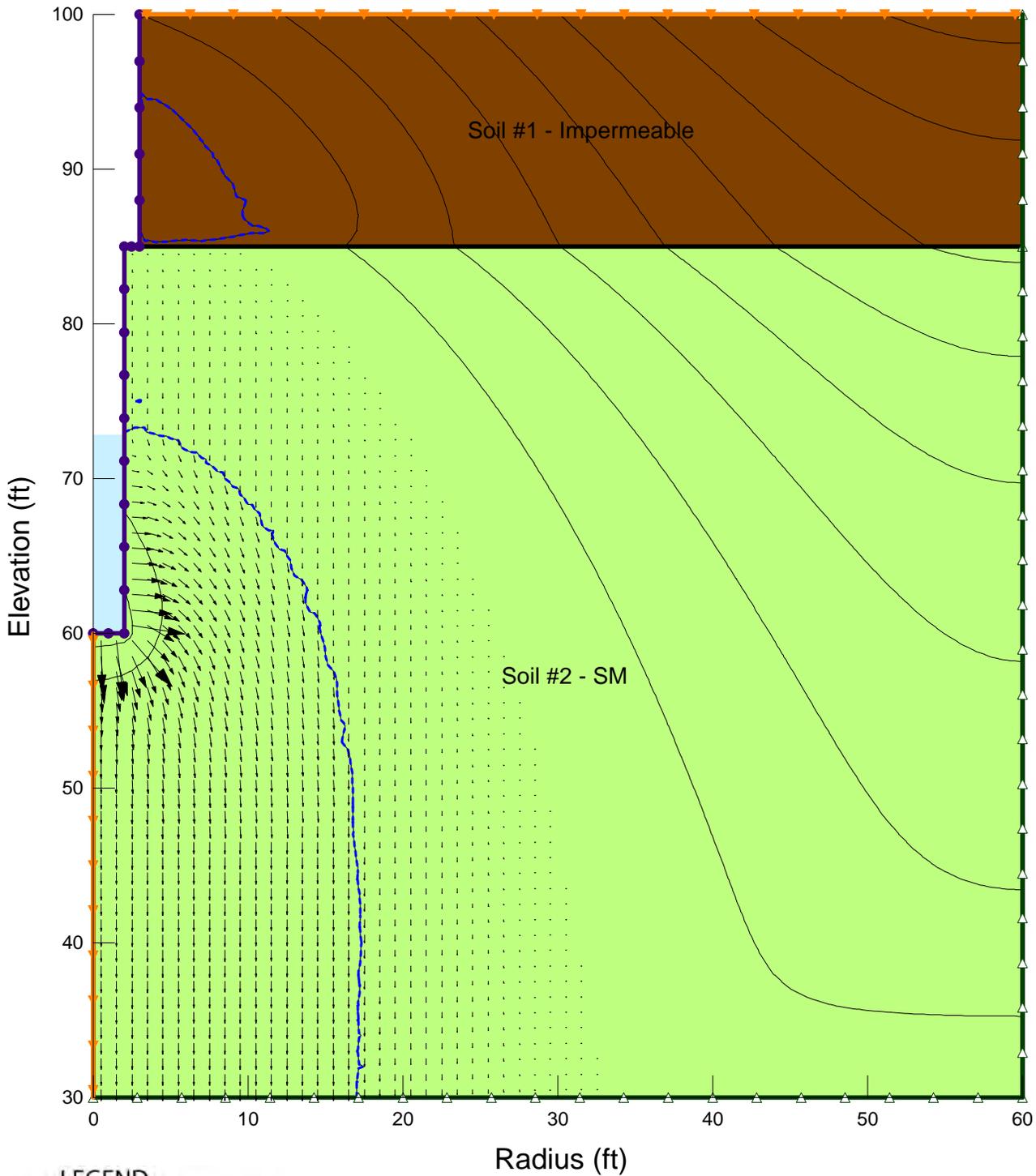
LEGEND



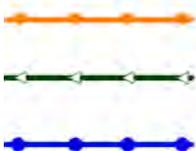
- Zero Flux
- Potential Seepage Face
- Fixed Total Head = 95'

Contours are Pressure Head in Feet.
Arrows indicate direction of flow and relative magnitude of velocity.

TRANSIENT STATE TIME =0.32 HOURS
FLOW ANALYSIS OF 40 ft DEEP, 4 ft DIAMETER DRY WELL



LEGEND



Zero Flux

Potential Seepage Face

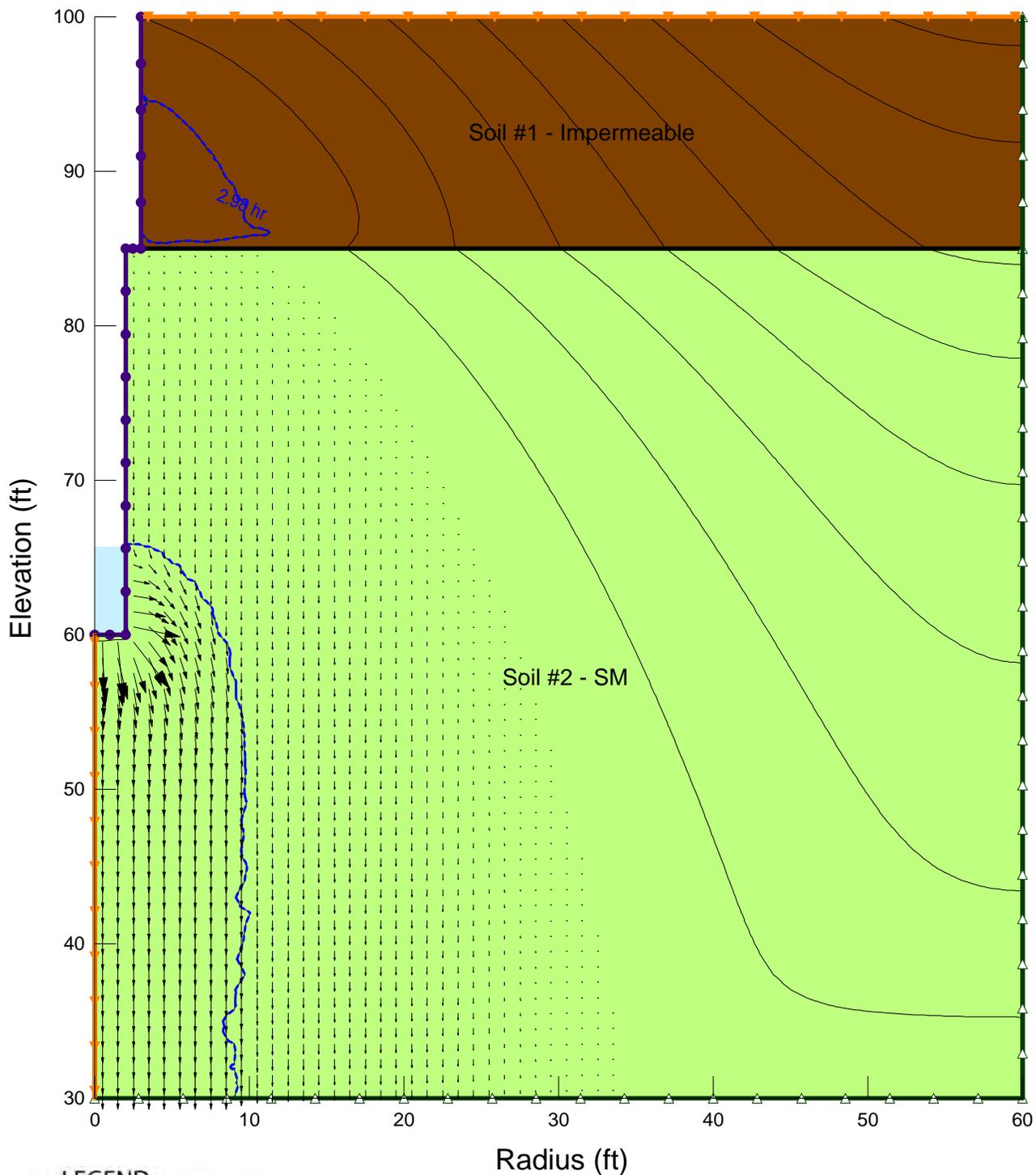
Fixed Total Head = 95'

Contours are Pressure Head in Feet.TR

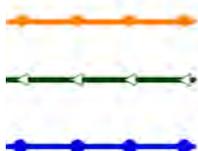
Arrows indicate direction of flow and relative magnitude of velocity.

TRANSIENT STATE TIME=0.48 HOURS

FLOW ANALYSIS OF 40 ft DEEP, 4 ft DIAMETER DRY WELL



LEGEND



Zero Flux

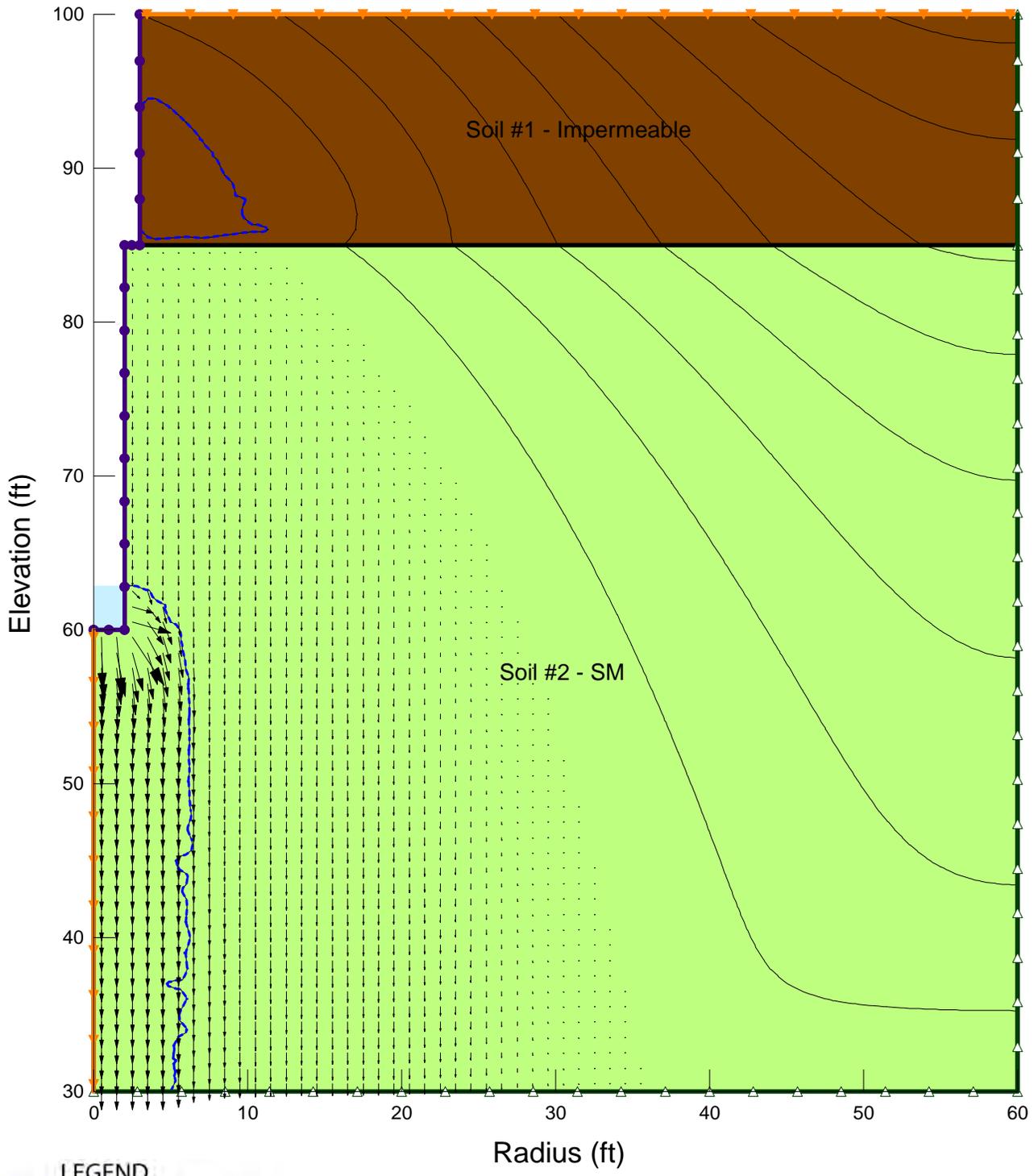
Potential Seepage Face

Fixed Total Head = 95'

Contours are Pressure Head in Feet.

Arrows indicate direction of flow and relative magnitude of velocity.

TRANSIENT STATE FLOW ANALYSIS OF 40 ft DEEP, 4 ft DIAMETER DRY WELL

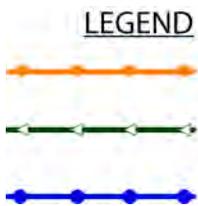
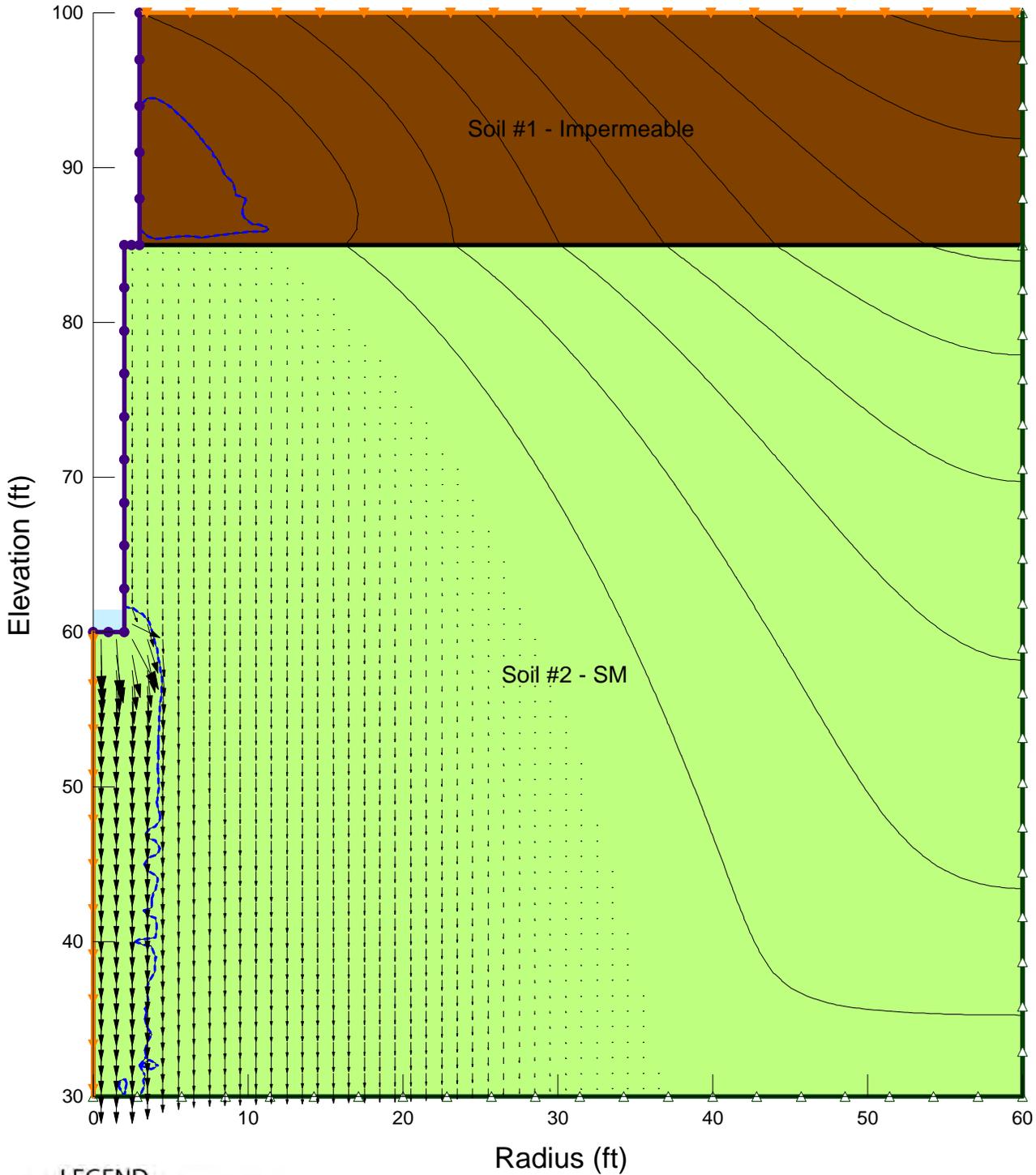


LEGEND

-  Zero Flux
-  Potential Seepage Face
-  Fixed Total Head = 95'

Contours are Pressure Head in Feet.
Arrows indicate direction of flow and relative magnitude of velocity.

VTCP UKGPV STATE VIO G? 20 2'J QWTU
FLOW ANALYSIS OF 40 ft DEEP, 4 ft DIAMETER DRY WELL



Zero Flux

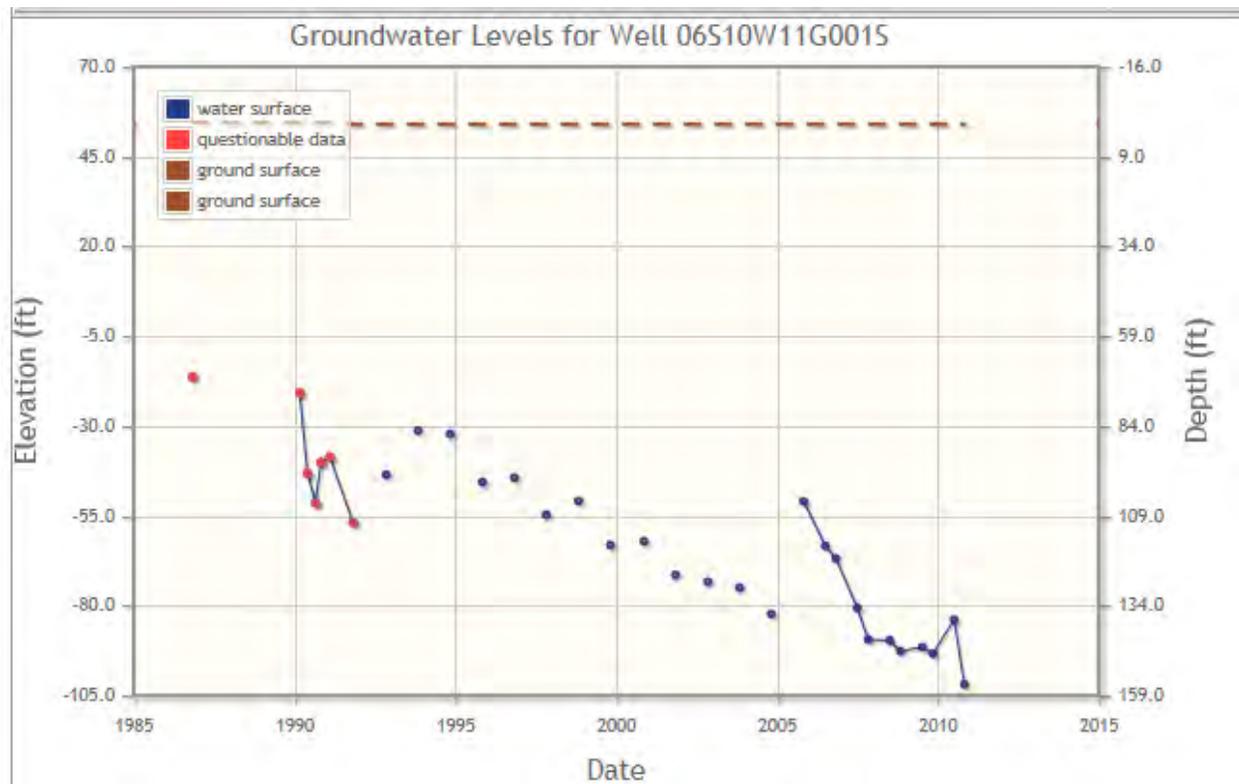
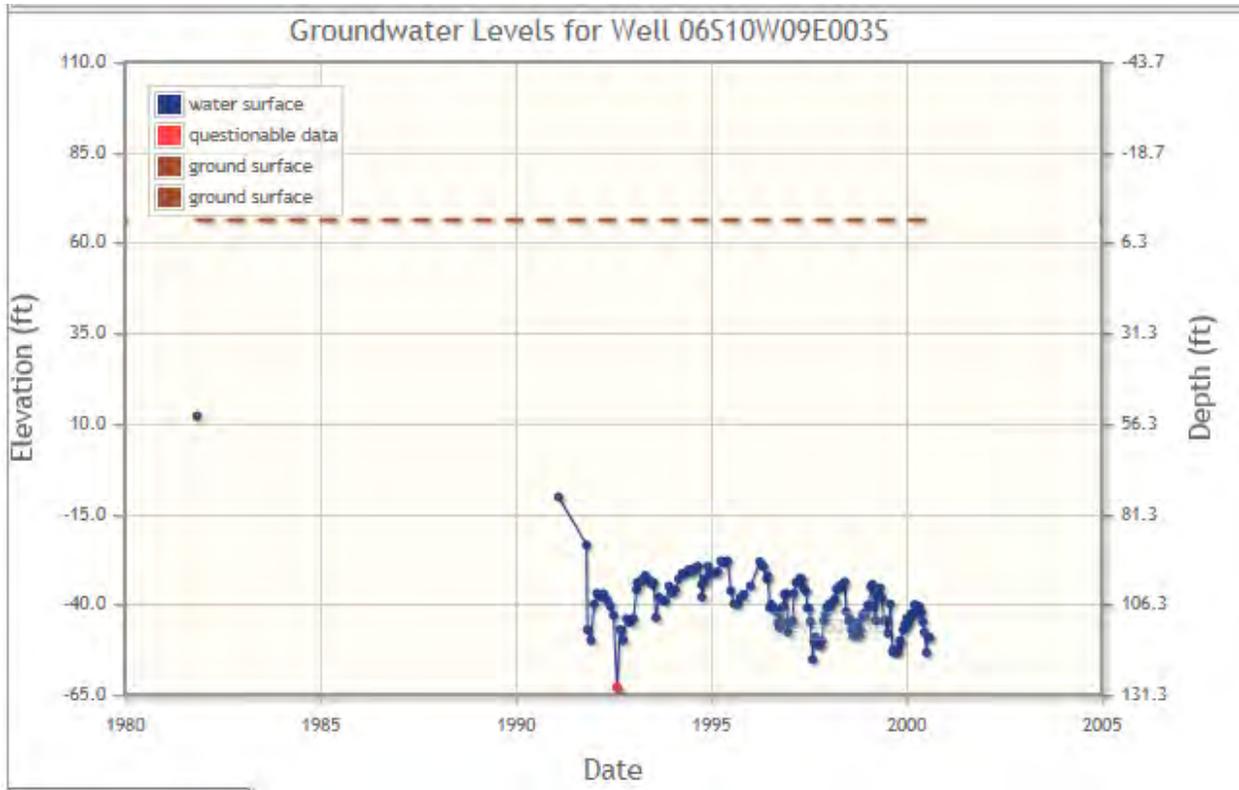
Potential Seepage Face

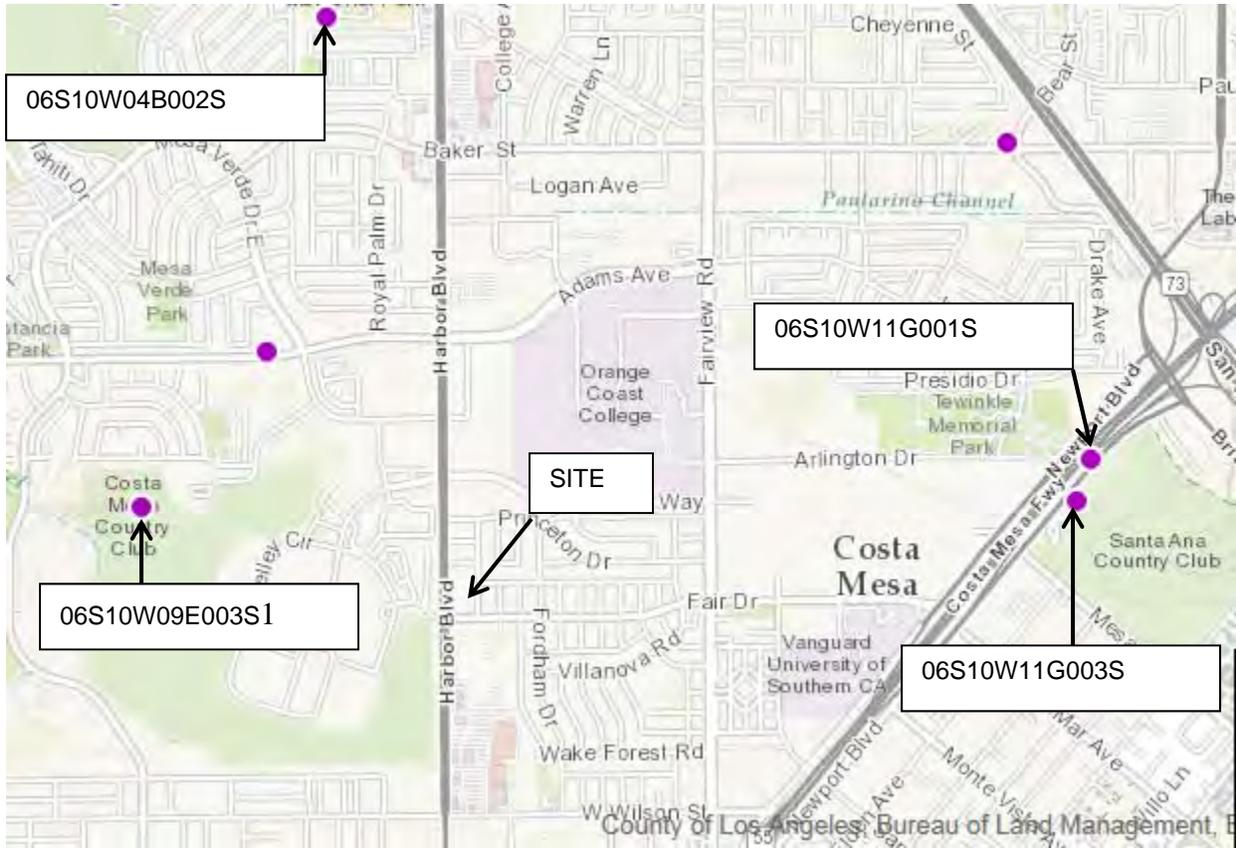
Fixed Total Head = 95'

Contours are Pressure Head in Feet. VTCP UKGPV

Arrows indicate direction of flow and relative magnitude of velocity.

APPENDIX D
GROUNDWATER DATA





Well Location Map

Attachment H

Technical Guidance Document Tables

TABLE 2.1

TABLE 2.2

Table 2.1: Anticipated and Potential Pollutants Generated by Land Use Type

Priority Project Categories and/or Project Features	General Pollutant Categories							
	Suspended Solid/Sediments	Nutrients	Heavy Metals	Pathogens (Bacteria/Virus)	Pesticides	Oil & Grease	Toxic Organic Compounds	Trash & Debris
Detached Residential Development	E	E	N	E	E	E	N	E
Attached Residential Development	E	E	N	E	E	E ⁽²⁾	N	E
Commercial/ Industrial Development	E ⁽¹⁾	E ⁽¹⁾	E ⁽⁵⁾	E ⁽³⁾	E ⁽¹⁾	E	E	E
Automotive Repair Shops	N	N	E	N	N	E	E	E
Restaurants	E ⁽¹⁾⁽²⁾	E ⁽⁴⁾	E ⁽²⁾	E	E ⁽¹⁾	E	N	E
Hillside Development >5,000 ft ²	E	E	N	E	E	E	N	E
Parking Lots	E	E ⁽¹⁾	E	E ⁽⁴⁾	E ⁽¹⁾	E	E	E
Streets, Highways, & Freeways	E	E ⁽¹⁾	E	E ⁽⁴⁾	E ⁽¹⁾	E	E	E
Retail Gasoline Outlets	N	N	E	N	N	E	E	E

E = expected to be of concern
 N = not expected to be of concern

- (1) Expected pollutant if landscaping exists on-site, otherwise not expected.
- (2) Expected pollutant if the project includes uncovered parking areas, otherwise not expected.
- (3) Expected pollutant if land use involves food or animal waste products, otherwise not expected.
- (4) Bacterial indicators are routinely detected in pavement runoff.
- (5) Expected if outdoor storage or metal roofs, otherwise not expected.

Table 2.2: Summary of the Approved 2010 303(d) Listed Water Bodies and Associated Pollutants of Concern for North Orange County

Region	Water Body	Bacteria Indicators/ Pathogens	Metals	Nutrients	Pesticides	Toxicity	Trash	Salinity/ TDS/ Chlorides	Turbidity	Other Organics
Region 8 Santa Ana	Anaheim Bay		X		X	X				X
	Bolsa Chica Channel		X							
	Buck Gully Creek	X								
	Coyote Creek	X		X	X	X				
	Huntington Beach State Park									X
	Huntington Harbor	X	X		X	X				X
	Los Trancos Creek (Crystal Cove Creek)	X								
	Newport Bay, Lower					X				X
	Newport Bay, Upper (Ecological Reserve)					X				X
	San Diego Creek, Reach 1	X								
	San Diego Creek, Reach 2									
	San Gabriel River, Reach 1	X								
	Seal Beach	X								X
<i>Silverado Creek</i>	X						X			

On October 11, 2011, the 2010 303(d) list was approved by USEPA Region 9. Project proponents should consult the most recent 303(d) list located on the State Water Resources Control Board website¹⁰.

¹⁰ http://www.swrcb.ca.gov/water_issues/programs/#wqassessment

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