PRELIMINARY DRAINAGE REPORT

UNIVERSITY OF SAN DIEGO
2015 MASTER PLAN
&
CONDITIONAL USE PERMIT
PTS 417090
SAN DIEGO, CALIFORNIA

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1.0 INTRODUCTION

The purpose of this Preliminary Drainage Report is to evaluate the existing and proposed drainage conditions in support of the University of San Diego's Main Campus 2015 Master Plan Project in support of a Conditional Use Permit (CUP) application. Specifically, this report will identify any potential hydrologic impacts and analyze potential mitigation measure alternatives to ensure that no existing public storm drain facilities will be negatively impacted as a result of this development. Refer to the Preliminary Storm Water Quality Management Plan (SWQMP) for a detailed description of how the project will address the water quality and hydromodification requirements consistent with the City of San Diego Storm Water Standards dated January 2016.

2.0 PROJECT INFORMATION

2.1 Project Location

The University of San Diego (USD) campus occupies approximately 180 acres of land devoted to university-related uses in the central portion of the City of San Diego (City), in the community of Linda Vista. The campus is located 4 miles north of downtown San Diego, approximately 0.5 mile east of Interstate 5 (I-5) and 0.5 mile north of Interstate 8 (I-8). The USD campus is located within an unsectioned area of Township 16 South, Range 3 West, on the U.S. Geological Survey (USGS) 7.5-minute La Jolla quadrangle map. Tecolote Canyon Natural Park forms the northern border of the property; Morena Boulevard is located to the west, with Via Las Cumbres bordering the campus on the east, and Linda Vista Road to the south. Elevations on campus range from approximately 50 feet above mean sea level (AMSL) to approximately 260 feet AMSL With the exception of the steep, north-facing slopes along the northern campus border and the slopes on the western end of campus near Marian Way, the majority of the campus is developed and supports university facilities (buildings, parking lots, athletic fields, etc.) and associated landscaping.

Surrounding land uses include commercial/industrial development and residential housing in the Morena Boulevard area to the west of the campus, student and non-student multi-family housing immediately to the south and various types of residential development to the east. Tecolote Canyon Natural Park contains undeveloped regional open space to the north. The City's Multi-habitat Planning Area (MHPA) occurs on approximately 7.6 acres along the northern edge of the campus and extends offsite into Tecolote Canyon. The campus is located within the Airport Influence Area (AIA) for San Diego International Airport and Montgomery Field.

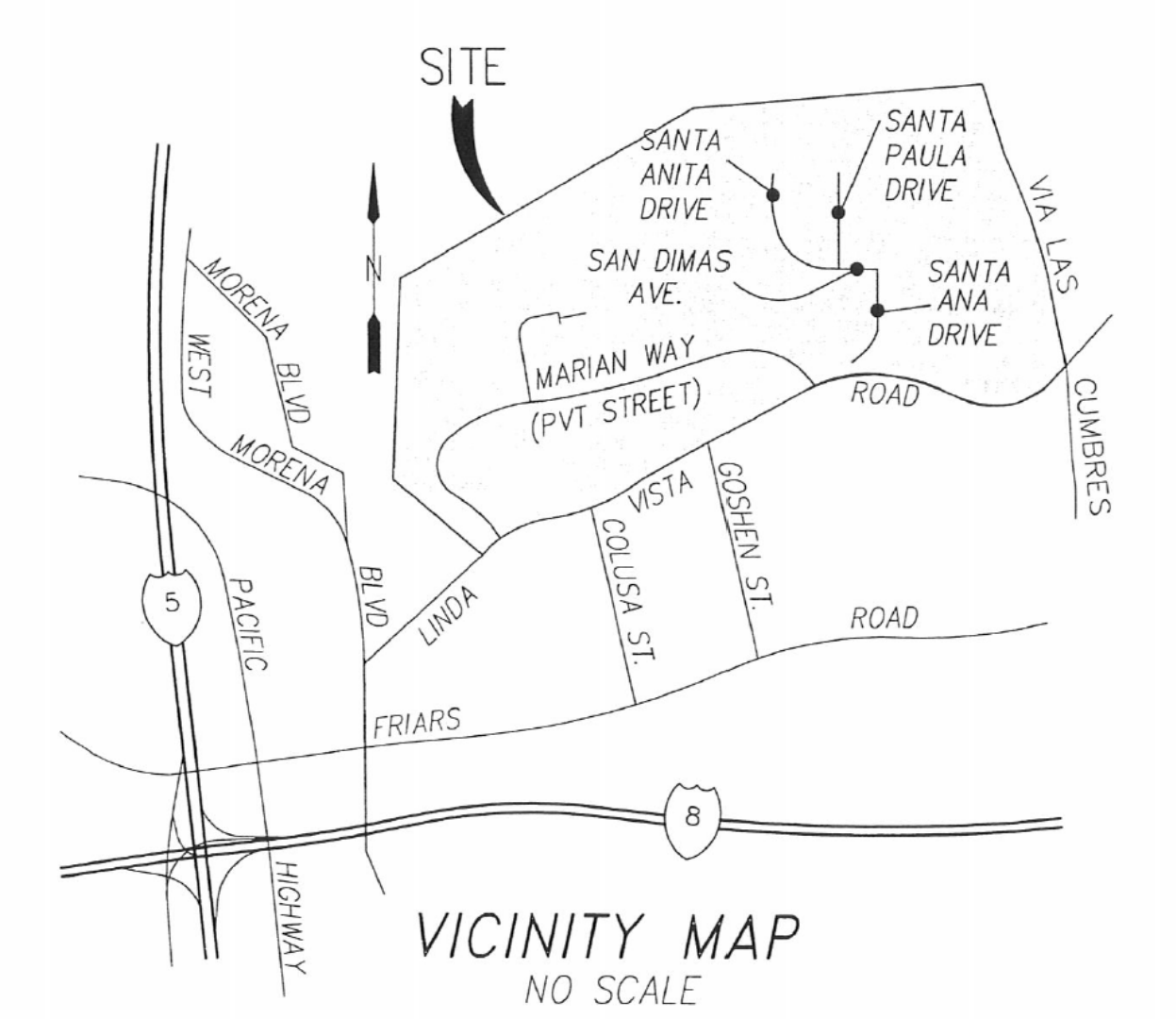

FIGURE 1 – VICINITY MAP

2.2 Project Description

In 1996, USD received approval of its existing Master Plan to guide the phased buildout of the campus through the year 2030. The City issued Conditional Use Permit (CUP)/ Resource Protection Ordinance (RPO) Permit No. 92-0568 to allow the campus to construct 23 conceptual projects and expand student population to 7,000 FTE. Two future study areas were also identified in the Master Plan. The sequence of the projects was not determined at that time in order to provide flexibility with regard to economics and academic needs. The 1996 Master

Plan EIR was prepared to assess the short- and long-term, as well as cumulative, impacts of implementing the Master Plan and was certified in conjunction with the CUP approvals.

The Master Plan is a document that records the vision and goals of the physical campus. This vision for the campus is updated from time to time to reflect the changes in demographics and the economy that affect higher education. Most importantly, the Master Plan is required by the City as the basis for the university's CUP and to ensure the University's fulfillment of current regulations. Over the last several years, USD campus officials have been conducting vision planning and space planning exercises to address the future needs of the university. An update to the existing Master Plan is now proposed.

The proposed USD Master Plan Update provides a comprehensive revision of the 1996 Master Plan and Design Guidelines, as well as the campus' building space and infrastructure needs associated with increasing enrollment from 7,000 full-time equivalent (FTE) students to 10,000 FTE over the next 20+ years. The USD Master Plan Update project would to allow for the development of academic core/student service/ support uses and athletics and recreation uses, and additional student housing. Parking supply expansions would also occur under the proposed Master Plan Update.

Among the projects outlined in the Master Plan Update are 14 proposed construction sites, as well as 16 approved projects identified in the 1996 Master Plan EIR that have previous City review/approvals but remain unbuilt. The 14 proposed project sites would allow for the construction of academic/administrative buildings, student housing, student services uses, athletics/athletic support/administrative buildings, parking, pedestrian circulation and landscape improvements not contemplated in the 1996 Master Plan and related EIR. Design guidelines contained in the Master Plan Update would provide a comprehensive design framework to guide campus development. Other elements of the Master Plan Update address the planning context of the campus, provide an enrollment and space analysis, and identify sustainability goals.

The above-described improvements would require the following entitlements: an amended CUP to allow for the continued institutional use, a Site Development Permit (SDP) to allow impacts to Environmentally Sensitive Lands (ESL), and MHPA Boundary Line Correction to shift developed land out of the Multiple Species Conservation Program (MSCP) preserve.

The Master Plan's proposed building projects include:

Site #	Project Description	Note
	Previously Approved Projects	
1	Approved as Sports Park; Tennis Center; Proposed Athletics/ Administrative/ Parking	(2)
2	Approved as Environmental Studies Building; New Academic/ Administrative Building	(1)
3	Approved as Library Expansion; New Academic/Administrative Building	(1)
4	Approved as Landscaped Pedestrian Mall; Proposed Plaza	(1)
5	Approved as Olin Hall Expansion with underground parking; Proposed Academic/Administrative Building with Parking	(2)
6	Approved as Hughes Expansion; Proposed Administrative/ Academic Building	(1)
7	Approved as Serra Hall Addition with partial demolition of existing building; Proposed Academic/Administrative Building	(1)
8	Approved as Pedestrian Mall; Proposed Plaza with enhanced connection across buildings and enhanced entry gateway and tram drop-off	(1)
9	Approved as Recreation, Wellness & Aquatic Center	(1)
10	Approved as Public Safety Building; Proposed Administrative/Parking	(1)
11	Approved as Renovation to Missions; Proposed Housing	(2)
12	Approved as Stadium Grandstands and Fieldhouse Facility	(1)
13	Approved as Collegiate Athletic Center and Office Building	(1)
14	Approved as parking and soccer field	(1)
15	Approved Residential Expansion	(1)
16	Approved as softball, golf and club sports building	(1)
	Proposed Projects	
17	Proposed Trails/ Landscape Enhancements	(3)
18	Parking/Administrative/Physical Plant. 2 levels above ground.	(3)
19	Plaza/Mall/Bridge	(3)
20	Proposed Academic/Administrative/Support	(3)
21	Proposed Academic/Administrative/Student Support Services	(3)
22	New Academic/Administrative Building (Four Stories to match Shiley Hall)	(3)
23	New Housing/Parking Structure	(3)
24	New Housing/ Student Services/ Parking	(3)
25	Proposed Academic/ Administrative / Parking Building	(3)
26	Engineering Expansion of Loma Hall; Proposed Academic/Administrative Building	(3)
27	Housing/Student Services	(3)
28	Athletics/Administrative Support	(3)
29	Facilities/Athletic Support	(3)
30	New Student Housing/Student Services/ Parking/Athletics	(3)

Notes:

(1) Project previously approved as part of CUP 92-0568 and/or SCR 140192, SCR 104201
(2) Project previously approved as part of CUP 92-0568. To be modified as part of this CUP Application
(3) Project proposed as part of this CUP Application

3.0 HYDROLOGIC AND HYDRAULIC METHODOLOGY

This section describes the methodology used to in developing the existing and proposed hydrologic and hydraulic calculations.

Runoff Calculations:

All drainage basins analyzed herein are less than one square mile and therefore runoff was calculated using the Rational Method, which is given by the following equation:

Q = C x I x A

Where:

- Q= Flow rate in cubic feet per second (cfs)
- C = Runoff coefficient
- I = Rainfall intensity in inches per hour (in/hr)
- A = Drainage basin area in acres (ac)

Soil Type - The Main Campus is located within two (2) watersheds (i.e. Los Penasquitos Hydrologic Unit and San Diego River Hydrologic Unit) as defined by the San Diego Basin Water Quality Control Plan (1994) referred to as the Basin Plan and shown on the Regional Water Quality Control Board's Hydrologic Basin Planning Area Map. Specifically, the northerly and easterly portion of the USD Main Campus is located within the Tecolote Creek HA (906.5), whereas the southerly and westerly areas are located within the Lower San Diego HA (907.1). Both areas are defined as being located within Hydrologic Soil Group "D". Therefore, consistent with the 1984 City of San Diego Drainage Design Manual (Manual), all calculations contained herein are based on this soil classification.

Runoff Coefficient ('C' Value) - The Manual does not provide Runoff Coefficients for land uses specific to the USD Campus. Therefore, in order to accurately represent the amount of runoff generated across the campus, multiple sub-areas were created. Each sub-area was outlined by considering localized drainage divides as well as the predominant ratio of impervious to pervious area. A majority of the corresponding 'C' Values were then assigned by comparing the characteristics of that sub-area to Table 2 of the Manual. For example:

- Higher impervious or Institutional areas were assigned a C-value of 0.85 consistent with the Commercial land use of Table 2.
- Pedestrian or Plaza areas that include primarily lawn and landscaped spaces were assigned a C-value of 0.55 consistent the Single Family land use of Table 2.
- Recreational areas that include very little or no impervious area were assigned a minimum C-value of 0.50 according to Note 2 of Table 2. As a conservative approach, existing artificial turf athletic fields were considered to be entirely pervious surfaces resulting in lower peak runoff rates in the existing condition. Furthermore, proposed artificial turf athletic fields were conservatively assumed to be impervious consistent with the Institutional or Commercial land use resulting in higher peak runoff rates in the developed condition.

Finally, large contiguous slopes and vegetated areas were outlined as a Natural land use. Since Table 2 of the Manual does not address natural areas, a C-value of 0.35 was assigned to this land use consistent with the Undisturbed or Natural, Type D soil, land use as identified in the County of San Diego Hydrology Manual.

Time of Concentration - Times of concentration for drainage basins were calculated based on initial or overland flow time, shallow concentrated flow and channel flow to each inlet point. Initial time or overland flow time was calculated using the following equation:

$$\mathbf{T_i = [1.8 \times (1.1 - C) \times L^{1/2}] / S^{1/3}}$$

Where:

- T_i = Initial (Overland) time of concentration in minutes
- C = Runoff coefficient
- L = Length of travel of runoff in feet
- S = Slope in percent

The travel time for shallow concentrated flow is a function of the water course length, surface condition, slope and resulting velocity. Based on surface conditions (paved or unpaved), assumptions can be made for Manning's roughness coefficient and hydraulic radius resulting in the following equation:

$$\mathbf{T_s = [L / (C \times S^{1/2})] * 60}$$

Where:

- T_s = Sheet flow time of concentration in minutes
- L = Length of travel of runoff in feet
- C = Manning's equation constant
  - = 16.1345 for unpaved surfaces
  - = 20.3282 for paved surfaces
- S = Slope in feet per feet

Lastly, travel time for channel flow was calculated as a function of flow length and average velocity. Longitudinal slopes along with estimated peak discharges were used to determine average velocities. The length of flow over a segment of longitudinal slope was then divided by the average velocity to determine channel flow travel time.

A minimum 5-minute time of concentration was used for runoff calculations and is based on the "Rainfall Intensity – Duration – Frequency Curves for County of San Diego" found in the Manual.

Intensity - The intensity of rainfall was obtained from the "Rainfall Intensity-Duration-Frequency Curves for County of San Diego" found in the Manual.

Detention Analysis:

Because detention analysis is dependent on the total storm volume, it is not sufficient to consider a single hydrography for peak flow occurring over the time of concentration. Therefore, hydrograph volumes were based on Section 6.2 of the County of San Diego Hydrology Manual dated June 2003. This process accounts for the total volume of runoff produced from the 6-hour storm event. The total volume from the resulting hydrograph is equal to the following equation:

$$\mathbf{VOL = CP_6A}$$

Where:

- VOL = volume of runoff (acre-inches)
- P6 = 6-hour rainfall (inches)
- C = runoff coefficient
- A = area of the watershed (acres)

4.0 EXISTING DRAINAGE CONDITION

The Main Campus is sited atop a mesa, with the highest elevation, located at the east side of campus at the intersection of Linda Vista and Via Las Cumbres, is approximately 265-feet. The lowest elevation, at the westerly entrance to the campus from Linda Vista, is approximately 55-feet.

Due to the hilltop nature of the campus, runoff is conveyed in multiple directions and discharged at eleven (11) distinct Study Points. These Study Points are generally divided into three (3) major tributary watersheds; Tecolote Canyon, Morena Boulevard and San Diego River.

The Tecolote Canyon Watershed includes the northern and easterly portions of the campus (approximately 92-acres) that drain towards Mission Bay via Tecolote Canyon. In general, runoff is conveyed south to north and discharges to Tecolote Canyon at Study Points 1 through 5.

The Morena Boulevard Watershed includes the northern and westerly portions of the campus (approximately 36-acres) that drain towards Mission Bay via public storm drain within Morena Boulevard. In general runoff is conveyed east to west and discharges to Morena Boulevard at Study Point 6.

The San Diego River Watershed includes southerly portions of the campus (approximately 60-acres) that drain to the San Diego River and ultimately discharging into the Pacific Ocean. In general runoff is conveyed north to south and discharges at Study Points 7 through 11.

Refer to the Existing Condition Hydrology Map for a graphical depiction of the drainage patterns, discharge points and overall watersheds.

5.0 DEVELOPED DRAINAGE CONDITION

The proposed development will maintain existing drainage patterns, as much as feasible, and runoff from the campus will continue to be split amongst the three watersheds. Although the developed condition drainage basins may not match the existing conditions exactly, diversions between the major drainage basins will be limited as much as possible and to the satisfaction of the City Engineer. Based on the preliminary Master Plan concept, a small area equal to approximately 0.3% of the 92-acre Tecolote Canyon Watershed is anticipated to be directed north from the ridge line of the San Diego River Watershed. This small diversion, if not eliminated during the SCR phase(s), is due to the hilltop nature of the campus and will be mitigated through the use of Integrated Management Practices that retain runoff to address water quality, hydromodification, and large storm attenuation requirements to the satisfaction of the City Engineer.

Refer to the Developed Condition Hydrology Map for a graphical depiction of the drainage patterns, discharge points and overall watersheds.

6.0 RESULTS & DISCUSSION

Calculations were performed to determine existing and developed condition peak discharge rates to the various study points (as described above). The following table summarizes this information for the 50 and 100-year storm events. Refer to Appendix A for more detail on the hydrology calculations.

EXISTING CONDITIONS					
BASIN NUMBER	**AREA (acres)**	**C Value**	**Tc (min)**	**Q_{50} (CFS)**	**Q_{100} (CFS)**
A1	45.40	0.53	11.9	72.19	77.00
B1	5.43	0.85	5.0	19.37	20.30
C1	32.85	0.65	9.1	70.09	76.46
D1	4.45	0.50	8.9	7.35	8.01
E1	3.77	0.50	7.3	6.78	7.53
SUB-TOTAL TECOLOTE CANYON	***91.89***	***0.59***		***175.78***	***189.30***
DEVELOPED CONDITIONS					
BASIN NUMBER	**AREA (acres)**	**C Value**	**Tc (min)**	**Q_{50} (CFS)**	**Q_{100} (CFS)**
L1	45.50	0.54	10.8	76.81	81.76
M1	5.44	0.85	5.0	19.43	20.36
N1	33.01	0.70	8.2	79.03	88.33
O1	4.45	0.50	8.9	7.35	8.01
P1	3.77	0.50	7.3	6.78	7.53
SUB-TOTAL TECOLOTE CANYON	***92.17***	***0.62***		***189.40***	***205.99***

Table 1.1 – Tecolote Canyon Existing and Proposed Hydrology Summary

EXISTING CONDITIONS					
BASIN NUMBER	**AREA (acres)**	**C Value**	**Tc (min)**	**Q_{50} (CFS)**	**Q_{100} (CFS)**
F1	36.25	0.58	13.9	61.31	65.53
SUB-TOTAL MORENA BLVD	***36.25***	***0.58***		***61.31***	***65.53***
DEVELOPED CONDITIONS					
BASIN NUMBER	**AREA (acres)**	**C Value**	**Tc (min)**	**Q_{50} (CFS)**	**Q_{100} (CFS)**
Q1	36.25	0.63	13.4	65.92	70.47
SUB-TOTAL MORENA BLVD	***36.25***	***0.63***		***65.92***	***70.47***

Table 1.2 – Morena Boulevard Existing and Proposed Hydrology Summary

EXISTING CONDITIONS					
BASIN NUMBER	**AREA (acres)**	**C Value**	**Tc (min)**	**Q_{50} (CFS)**	**Q_{100} (CFS)**
G1	5.90	0.85	5.0	21.08	22.08
H1	9.99	0.50	10.8	15.48	16.48
I1	8.86	0.50	8.3	15.07	16.84
J1	24.02	0.57	7.6	48.21	53.72
K1	9.25	0.78	8.7	23.90	26.07
SUB-TOTAL SAN DIEGO RIVER	***58.02***	***0.61***		***123.74***	***135.19***
DEVELOPED CONDITIONS					
BASIN NUMBER	**AREA (acres)**	**C Value**	**Tc (min)**	**Q_{50} (CFS)**	**Q_{100} (CFS)**
R1	5.90	0.85	5.0	21.08	22.08
S1	9.99	0.50	10.8	15.48	16.48
T1	8.86	0.50	8.3	15.07	16.84
U1	24.02	0.68	7.3	58.66	65.18
V1	8.97	0.85	6.4	28.98	31.26
SUB-TOTAL SAN DIEGO RIVER	***57.75***	***0.66***		***139.27***	***151.84***

Table 1.3 – San Diego River Existing and Proposed Hydrology Summary

In Tables 1.1 through 1.3, it can be seen that a majority of the development will take place within the Tecolote Canyon and San Diego River Watersheds. The increased runoff within all three of these watersheds is due to the change in land use, higher runoff coefficient and shorter time of concentration paths.

TECOLOTE CANYON				
Existing Condition				
DRAINAGE BASIN	**50-YEAR PEAK FLOW (CFS)**	**50-YEAR VOLUME (AC-in)[a]**	**100-YEAR PEAK FLOW (CFS)**	**100-YEAR VOLUME (AC-in)[a]**
A1	72.19	50.53	77.00	55.34
B1	19.37	9.69	20.30	10.61
C1	70.09	44.60	76.46	48.85
D1	7.35	4.67	8.01	5.12
E1	6.78	3.96	7.53	4.33
TOTAL	**175.78**	**113.45**	**189.30**	**124.26**
Developed Condition				
DRAINAGE BASIN	**50-YEAR PEAK FLOW (CFS)**	**50-YEAR VOLUME (AC-in)[a]**	**100-YEAR PEAK FLOW (CFS)**	**100-YEAR VOLUME (AC-in)[a]**
L1	76.81	52.03	81.76	56.99
M1	19.43	9.72	20.36	10.64
N1	79.03	48.82	88.33	53.46
O1	7.35	4.67	8.01	5.12
P1	6.78	3.96	7.53	4.33
TOTAL	**189.40**	**119.19**	**205.99**	**130.54**
DELTA	***13.62***	***5.74***	***16.69***	***6.29***
MORENA BLVD.				
Existing Condition				
DRAINAGE BASIN	**50-YEAR PEAK FLOW (CFS)**	**50-YEAR VOLUME (AC-in)[a]**	**100-YEAR PEAK FLOW (CFS)**	**100-YEAR VOLUME (AC-in)[a]**
F1	61.31	44.39	65.53	48.62
TOTAL	**61.31**	**44.39**	**65.53**	**48.62**
Developed Condition				
DRAINAGE BASIN	**50-YEAR PEAK FLOW (CFS)**	**50-YEAR VOLUME (AC-in)[a]**	**100-YEAR PEAK FLOW (CFS)**	**100-YEAR VOLUME (AC-in)[a]**
Q1	65.92	47.74	70.47	52.29
TOTAL	**65.92**	**47.74**	**70.47**	**52.29**
DELTA	***4.62***	***3.34***	***4.94***	***3.66***
SAN DIEGO RIVER				
Existing Condition				
DRAINAGE BASIN	**50-YEAR PEAK FLOW (CFS)**	**50-YEAR VOLUME (AC-in)[a]**	**100-YEAR PEAK FLOW (CFS)**	**100-YEAR VOLUME (AC-in)[a]**
G1	21.08	10.54	22.08	11.54
H1	15.48	10.49	16.48	11.49
I1	15.07	9.31	16.84	10.19
J1	48.21	28.93	53.72	31.68
K1	23.90	15.21	26.07	16.66
TOTAL	**123.74**	**74.47**	**135.19**	**81.56**
Developed Condition				
DRAINAGE BASIN	**50-YEAR PEAK FLOW (CFS)**	**50-YEAR VOLUME (AC-in)[a]**	**100-YEAR PEAK FLOW (CFS)**	**100-YEAR VOLUME (AC-in)[a]**
R1	21.08	10.54	22.08	11.54
S1	15.48	10.49	16.48	11.49
T1	15.07	9.31	16.84	10.19
U1	58.66	34.22	65.18	37.48
V1	28.98	16.01	31.26	17.54
TOTAL	**139.27**	**80.57**	**151.84**	**88.24**
DELTA	***15.53***	***6.10***	***16.65***	***6.68***

Table 2.1 – Watershed: Existing and Proposed Flow Summary

STUDY POINT 1					
CONDITION	**DRAINAGE BASIN**	**50-YEAR PEAK FLOW (CFS)**	**50-YEAR VOLUME (AC-in)[a]**	**100-YEAR PEAK FLOW (CFS)**	**100-YEAR VOLUME (AC-in)[a]**
Existing	A1	72.19	50.53	77.00	55.34
Developed	L1	76.81	52.03	81.76	56.99
DELTA		***4.62***	***1.50***	***4.76***	***1.64***
STUDY POINT 2					
CONDITION	**DRAINAGE BASIN**	**50-YEAR PEAK FLOW (CFS)**	**50-YEAR VOLUME (AC-in)[a]**	**100-YEAR PEAK FLOW (CFS)**	**100-YEAR VOLUME (AC-in)[a]**
Existing	B1	19.37	9.69	20.30	10.61
Developed	M1	19.43	9.72	20.36	10.64
DELTA		***0.06***	***0.03***	***0.06***	***0.03***
STUDY POINT 3					
CONDITION	**DRAINAGE BASIN**	**50-YEAR PEAK FLOW (CFS)**	**50-YEAR VOLUME (AC-in)[a]**	**100-YEAR PEAK FLOW (CFS)**	**100-YEAR VOLUME (AC-in)[a]**
Existing	C1	70.09	44.60	76.46	48.85
Developed	N1	79.03	48.82	88.33	53.46
DELTA		***8.94***	***4.21***	***11.87***	***4.61***
STUDY POINT 4					
CONDITION	**DRAINAGE BASIN**	**50-YEAR PEAK FLOW (CFS)**	**50-YEAR VOLUME (AC-in)[a]**	**100-YEAR PEAK FLOW (CFS)**	**100-YEAR VOLUME (AC-in)[a]**
Existing	D1	7.35	4.67	8.01	5.12
Developed	O1	7.35	4.67	8.01	5.12
DELTA		***0.00***	***0.00***	***0.00***	***0.00***
STUDY POINT 5					
CONDITION	**DRAINAGE BASIN**	**50-YEAR PEAK FLOW (CFS)**	**50-YEAR VOLUME (AC-in)[a]**	**100-YEAR PEAK FLOW (CFS)**	**100-YEAR VOLUME (AC-in)[a]**
Existing	E1	6.78	3.96	7.53	4.33
Developed	P1	6.78	3.96	7.53	4.33
DELTA		***0.00***	***0.00***	***0.00***	***0.00***
STUDY POINT 6					
CONDITION	**DRAINAGE BASIN**	**50-YEAR PEAK FLOW (CFS)**	**50-YEAR VOLUME (AC-in)[a]**	**100-YEAR PEAK FLOW (CFS)**	**100-YEAR VOLUME (AC-in)[a]**
Existing	F1	61.31	44.39	65.53	48.62
Developed	Q1	65.92	47.74	70.47	52.29
DELTA		***4.62***	***3.34***	***4.94***	***3.66***

Table 2.2 – Study Point: Existing and Proposed Flow Summary

STUDY POINT 7					
CONDITION	**DRAINAGE BASIN**	**50-YEAR PEAK FLOW (CFS)**	**50-YEAR VOLUME (AC-in)[a]**	**100-YEAR PEAK FLOW (CFS)**	**100-YEAR VOLUME (AC-in)[a]**
Existing	G1	21.08	10.54	22.08	11.54
Developed	R1	21.08	10.54	22.08	11.54
DELTA		***0.00***	***0.00***	***0.00***	***0.00***
STUDY POINT 8					
CONDITION	**DRAINAGE BASIN**	**50-YEAR PEAK FLOW (CFS)**	**50-YEAR VOLUME (AC-in)[a]**	**100-YEAR PEAK FLOW (CFS)**	**100-YEAR VOLUME (AC-in)[a]**
Existing	H1	15.48	10.49	16.48	11.49
Developed	S1	15.48	10.49	16.48	11.49
DELTA		***0.00***	***0.00***	***0.00***	***0.00***
STUDY POINT 9					
CONDITION	**DRAINAGE BASIN**	**50-YEAR PEAK FLOW (CFS)**	**50-YEAR VOLUME (AC-in)[a]**	**100-YEAR PEAK FLOW (CFS)**	**100-YEAR VOLUME (AC-in)[a]**
Existing	I1	15.07	9.31	16.84	10.19
Developed	*T1*	15.07	9.31	16.84	10.19
DELTA		***0.00***	***0.00***	***0.00***	***0.00***
STUDY POINT 10					
CONDITION	**DRAINAGE BASIN**	**50-YEAR PEAK FLOW (CFS)**	**50-YEAR VOLUME (AC-in)[a]**	**100-YEAR PEAK FLOW (CFS)**	**100-YEAR VOLUME (AC-in)[a]**
Existing	J1	48.21	28.93	53.72	31.68
Developed	*U1*	58.66	34.22	65.18	37.48
DELTA		***10.45***	***5.29***	***11.46***	***5.80***
STUDY POINT 11					
CONDITION	**DRAINAGE BASIN**	**50-YEAR PEAK FLOW (CFS)**	**50-YEAR VOLUME (AC-in)[a]**	**100-YEAR PEAK FLOW (CFS)**	**100-YEAR VOLUME (AC-in)[a]**
Existing	*K1*	23.90	15.21	26.07	16.66
Developed	*V1*	28.98	16.01	31.26	17.54
DELTA		***5.08***	***0.81***	***5.19***	***0.88***

Table 2.2 (Continued) – Study Point: Existing and Proposed Flow Summary

In Tables 2.1 and 2.2, it can be seen that the largest increase in flow and volume will occur within the Tecolote Canyon and San Diego River Watersheds. In particular there will be a large increase at Study Points 1, 3, 6, 10, and 11. Development within these drainage basins will convert land cover from large open space areas, both natural and developed (sports fields), to a more impervious land use.

There is however, no anticipated increase (or very minimal) in runoff flow rate or volume to Study Points 2, 4, 5, 7, 8 & 9. Projects within these basins will not change land use types or impact the overall time of concentration of the basin.

7.0 STORMWATER QUALITY, HYDROMODIFICATION & 100-YEAR DETENTION

A separate Preliminary Storm Water Quality Management Plant (SWQMP) was prepared in conjunction with this project that addresses in detail the water quality requirements for each project identified in the Main Campus 2015 Master Plan. Refer to the Preliminary SWQMP for the identification of anticipated/potential pollutants of concern, Site Design (also referred to as LID BMPs) and Source Control BMPs as well as potential Pollutant Control and Hydromodification Management Facilities that will be incorporated into this project to comply with the state requirements in place at the time this report was prepared..

In addition to providing water quality treatment and Hydromodificaiton control, it is anticipated that structural BMPs proposed by each project will provide large storm attenuation up to and including the 100-year storm event. Total detention volume of each BMP (i.e. assumed as lined Bioretention Basins/Flow Thru Planters for this evaluation) is considered to include surface ponding as well as sub-surface storage. This approach is considered appropriate because the minimum 5 inches/hour BMP percolation rate required by the City of San Diego Storm Water Standards Manual exceeds the maximum 4.4 inches/hour rainfall rate for the 100-year storm event according to the City of San Diego Drainage Manual. The hydromodification volume and large storm detention volumes may also be satisfied with the use of biofiltration basins plus cisterns/vaults, as allowed by the permit requirements. The final selection of the BMP(s), including their sizing, will be identified as a part of each project's substantial conformance review application, consistent with the storm water permit in place at the time, and to the satisfaction of the City of San Diego.

The following table summarizes the anticipated peak flow and volumes to each of the Study Points as well as a cumulative summary of the proposed water quality and Hydromodification volume requirements based on the aforementioned storage approach.

100-YEAR DETENTION ANALYSIS				
PROJECT SITE	**EXISTING 100-YEAR PEAK IN-FLOW (CFS)**	**PROPOSED 100-YEAR PEAK DISCHARGE (CFS)**	**100-YR 6HR VOLUME REQUIRED (FT^3)**	**WATER QUALITY & HYDROMOD VOLUME DETAINED (FT^3)**
STUDY POINT 1				
Site 13 (75%)				15,428
Site 14				46,039
Site 15				9,533
Site 16				5,629
Site 28				3,323
Site 29				3,440
Site 30				28,751
TOTAL	**77.00**	**81.76**	**5,965**	**112,143**
STUDY POINT 2				
PROJECT SITE	**EXISTING 100-YEAR PEAK IN-FLOW (CFS)**	**PROPOSED 100-YEAR PEAK DISCHARGE (CFS)**	**100-YR 6HR VOLUME REQUIRED (FT^3)**	**WATER QUALITY & HYDROMOD VOLUME DETAINED (FT^3)**
Site 27 (75%)				11,596
TOTAL	**20.30**	**20.36**	**119**	**11,596**

Table 3.1 – 100-Year Detention Analysis

STUDY POINT 3				
PROJECT SITE	**EXISTING 100-YEAR PEAK IN-FLOW (CFS)**	**PROPOSED 100-YEAR PEAK DISCHARGE (CFS)**	**100-YR 6HR VOLUME REQUIRED (FT^3)**	**WATER QUALITY & HYDROMOD VOLUME DETAINED (FT^3)**
Site 9				35,637
Site 11				7,155
Site 13 (25%)				5,142
Site 27 (25%)				3,866
TOTAL	**76.46**	**88.33**	**16,744**	**51,800**
STUDY POINT 6				
PROJECT SITE	**EXISTING 100-YEAR PEAK IN-FLOW (CFS)**	**PROPOSED 100-YEAR PEAK DISCHARGE (CFS)**	**100-YR 6HR VOLUME REQUIRED (FT^3)**	**WATER QUALITY & HYDROMOD VOLUME DETAINED (FT^3)**
Site 1				25,218
Site 2				3,183
Site 3				10,603
Site 18				13,617
Site 21				5,410
TOTAL	**65.53**	**70.47**	**13,298**	**58,031**
STUDY POINT 10				
PROJECT SITE	**EXISTING 100-YEAR PEAK IN-FLOW (CFS)**	**PROPOSED 100-YEAR PEAK DISCHARGE (CFS)**	**100-YR 6HR VOLUME REQUIRED (FT^3)**	**WATER QUALITY & HYDROMOD VOLUME DETAINED (FT^3)**
Site 4				19,870
Site 5				13,213
Site 6				7,752
Site 22				26,517
Site 23				22,933
TOTAL	**53.72**	**65.18**	**21,049**	**90,285**
STUDY POINT 11				
PROJECT SITE	**EXISTING 100-YEAR PEAK IN-FLOW (CFS)**	**PROPOSED 100-YEAR PEAK DISCHARGE (CFS)**	**100-YR 6HR VOLUME REQUIRED (FT^3)**	**WATER QUALITY & HYDROMOD VOLUME DETAINED (FT^3)**
Site 7				10,097
Site 10				5,329
Site 25				8,562
Site 26				10,290
TOTAL	**26.07**	**31.26**	**3,205**	**34,278**

Table 3.1 (Continued) – 100-Year Detention Analysis

Note that there are no projects proposed within the drainage basins of Study Points 7 through 9, and no increase in flow to Study Points 4 & 5. Therefore, these Study Points have not been included in Table 3.1.

From the above analysis, it is anticipated that the water quality and Hydromodification volumes proposed with each project will also effectively mitigate for any increase in peak flow during the 100-year storm event.

8.0 CONCLUSION

This Preliminary Drainage Report has been prepared in support of the University of San Diego's Main Campus 2015 Master Plan and associated Conditional Use Permit (CUP) application. This report concludes that the development of the USD Campus will be consistent with the existing hydrologic conditions. Specifically, development will not change the overall drainage patterns with the possible exception of a minor (less than 0.3%) redirection of area to the Tecolote Canyon Watershed. This possible redirection has been identified due to the hilltop nature of the USD Campus as well as the preliminary nature of the project site plans. During the Substantial Conformance Review (SCR) process each site plan/project will be further refined to minimize or eliminate the redirection of runoff. If further study indicates that fully maintaining the existing condition is not feasible, storm water management facilities will be implemented to effectively mitigate any increase in peak flows across all watersheds to the satisfaction of the City Engineer.

The preliminary hydrograph volume analysis takes into account the potential for this minor diversion as a conservative approach to the detention requirements. The results of this analysis indicate that water quality and Hydromodification best management practices constructed by each project will in fact mitigate any increase in runoff due to development and due to this potential minor diversion. Therefore, there is no anticipated need for regional or common detention basins. Since mitigated storm flows are anticipated to be the same as the existing condition, and all flow is directed towards Tecolote Canyon, Morena Boulevard, or the San Diego River, there are no anticipated adverse impacts to downstream drainage facilities or natural drainage courses.

As required by the City of San Diego, if any of the development sites/projects require approval from the Regional Water Quality Control Board (RWQCB) under the Federal Clean Water Act (CWA), Section 401 or 404, a complete a complete explanation shall be included in the future detailed project specific drainage report. It is also understood that approvals from the RWQCB will be required as a condition of grading plan approval and permit issuance.

As required by the City of San Diego, any increase in runoff resulting from the development of any of the sites/projects shall be directed away from any steep hillside areas and either into an

existing or newly improved storm drain system or into a street developed with a gutter system or public right-of-way designated to carry surface drainage runoff.
This Preliminary Drainage Report concludes has been completed in accordance with current City of San Diego requirements and there are no anticipated adverse impacts to adjacent properties or existing storm drain facilities as a result of this development.

In addition, it is understood that each development site/project will be required to prepare and submit for approval, a detailed project specific drainage report. These future detailed studies will be required to address and confirm the City of San Diego requirements in place at that time and include detailed calculations to demonstrate that the proposed BMPs can attenuate any increase in peak runoff.

APPENDIX A: EXISTING AND PROPOSED HYDROLOGY CALCULATIONS

Runoff Coefficient Calculations

Existing Conditions

Sub-Area	Land Use[a]	Total Area	Impervious Area[a]	% Impervious[a]	Runoff Coefficent (C Value)[b]
101	Natural	3.56	0.00	0.0%	0.35
102	Natural	5.65	0.00	0.0%	0.35
103	Recreational	6.70	0.00	<10%	0.50
104	Recreational	1.18	0.00	<10%	0.50
105	Institutional	28.31	22.65	80.0%	0.85
DRAINAGE BASIN A1		**45.40**	**22.65**	**49.9%**	**0.53**
201	Institutional	5.43	4.34	80.0%	0.85
DRAINAGE BASIN B1		**5.43**	**4.34**	**80.0%**	**0.85**
301	Natural	3.60	0.00	0.0%	0.35
302	Recreational	2.08	0.00	<10%	0.50
303	Recreational	2.18	0.00	<10%	0.50
304	Institutional	24.99	19.99	80.0%	0.85
DRAINAGE BASIN C1		**32.85**	**19.99**	**60.9%**	**0.65**
401	Natural	2.52	0.00	0.0%	0.35
402	Institutional	1.75	1.40	80.0%	0.85
403	Pedestrian/Plaza	0.19	0.06	30.0%	0.55
DRAINAGE BASIN D1		**4.45**	**1.45**	**32.6%**	**0.50**
501	Natural	2.52	0.00	0.0%	0.35
502	Institutional	1.24	1.00	80.0%	0.85
DRAINAGE BASIN E1		**3.77**	**1.00**	**26.4%**	**0.50**
601	Natural	9.51	0.00	0.0%	0.35
602	Institutional	19.45	15.56	80.0%	0.85
603	Institutional	5.42	4.34	80.0%	0.85
604	Recreational	0.76	0.00	<10%	0.50
605	Natural	1.11	0.00	0.0%	0.35
DRAINAGE BASIN F1		**36.25**	**19.90**	**54.9%**	**0.58**
701	Institutional	5.90	4.72	80.0%	0.85
DRAINAGE BASIN G1		**5.90**	**4.72**	**80.0%**	**0.85**
801	Natural	4.47	0.00	0.0%	0.35
802	Institutional	5.52	4.41	80.0%	0.85
DRAINAGE BASIN H1		**9.99**	**4.41**	**44.2%**	**0.50**
901	Natural	4.53	0.00	0.0%	0.35
902	Institutional	4.33	3.47	80.0%	0.85
DRAINAGE BASIN I1		**8.86**	**3.47**	**39.1%**	**0.50**
1001	Natural	7.34	0.00	0.0%	0.35
1002	Institutional	2.24	1.79	80.0%	0.85
1003	Institutional	13.68	10.95	80.0%	0.85
1004	Pedestrian/Plaza	0.76	0.23	30.0%	0.55
DRAINAGE BASIN J1		**24.02**	**12.96**	**54.0%**	**0.57**
1101	Institutional	8.34	6.67	80.0%	0.35
1102	Institutional	0.18	0.15	80.0%	0.85
1103	Institutional	0.73	0.00	<10%	1.85
DRAINAGE BASIN K1		**9.25**	**6.82**	**73.7%**	**0.78**
TOTAL		**186.17**	**101.71**	**54.6%**	**0.58**

[a] Sub-Area 'Impervious Area' based on 'Land Use' designation and 'Percent Impervious' as identified in Table 2 of the City of San Diego Drainage Design Manual.

[b] Sub-Area 'Runoff Coefficient' according to 'Land Use' designations as identified in Table 2 of the City of San Diego Drainage Design Manual. Drainage Basin Composite Runoff Coefficients were calculated using Note (2) of Table 2.

Runoff Coefficient Calculations

Proposed Conditions

Sub-Area	Land Use[a]	Total Area	Impervious Area[a]	% Impervious[a]	Runoff Coefficent (C Value)[b]
1201	Natural	2.54	0.00	0.0%	0.35
1202	Natural	5.62	0.00	0.0%	0.35
1203	Recreational	6.21	0.00	<10%	0.50
1204	Recreational	1.18	0.00	<10%	0.50
1205	Recreational	0.80	0.00	<10%	0.50
1206	Institutional	29.15	23.32	80.0%	0.85
DRAINAGE BASIN L1		**45.50**	**23.32**	**51.3%**	**0.54**
1301	Institutional	5.44	4.36	80.0%	0.85
DRAINAGE BASIN M1		**5.44**	**4.36**	**80.0%**	**0.85**
1401	Natural	2.51	0.00	0.0%	0.35
1402	Recreational	2.18	0.00	<10%	0.50
1403	Open Space	1.55	0.47	30.0%	0.50
1404	Institutional	26.76	21.41	80.0%	0.85
DRAINAGE BASIN N1		**33.01**	**21.88**	**66.3%**	**0.70**
1501	Natural	2.52	0.00	0.0%	0.35
1502	Institutional	1.55	1.24	80.0%	0.85
1503	Pedestrian/Plaza	0.39	0.12	30.0%	0.55
DRAINAGE BASIN O1		**4.45**	**1.35**	**30.4%**	**0.50**
1601	Natural	2.50	0.00	0.0%	0.35
1602	Institutional	1.26	1.01	80.0%	0.85
DRAINAGE BASIN P1		**3.77**	**1.01**	**26.8%**	**0.50**
1701	Natural	9.51	0.00	0.0%	0.35
1702	Institutional	19.45	15.56	80.0%	0.85
1703	Institutional	7.29	5.84	80.0%	0.85
DRAINAGE BASIN Q1		**36.25**	**21.40**	**59.0%**	**0.63**
1801	Institutional	5.90	4.72	80.0%	0.85
DRAINAGE BASIN R1		**5.90**	**4.72**	**80.0%**	**0.85**
1901	Natural	4.47	0.00	0.0%	0.35
1902	Institutional	5.52	4.41	80.0%	0.85
DRAINAGE BASIN S1		**9.99**	**4.41**	**44.2%**	**0.50**
2001	Natural	4.53	0.00	0.0%	0.35
2002	Institutional	4.33	3.47	80.0%	0.85
DRAINAGE BASIN T1		**8.86**	**3.47**	**39.1%**	**0.50**
2101	Natural	3.02	0.00	0.0%	0.35
2102	Institutional	18.08	14.46	80.0%	0.85
2103	Pedestrian/Plaza	2.92	0.88	30.0%	0.55
DRAINAGE BASIN U1		**24.02**	**15.34**	**63.9%**	**0.68**
2201	Institutional	8.89	7.12	80.0%	0.35
2202	Institutional	0.08	0.06	80.0%	0.85
DRAINAGE BASIN V1		**8.97**	**7.18**	**80.0%**	**0.85**
TOTAL		**186.17**	**108.43**	**58.2%**	**0.62**

[a] Sub-Area 'Impervious Area' based on 'Land Use' designation and 'Percent Impervious' as identified in Table 2 of the City of San Diego Drainage Design Manual.

[b] Sub-Area 'Runoff Coefficient' according to 'Land Use' designations as identified in Table 2 of the City of San Diego Drainage Design Manual. Drainage Basin Composite Runoff Coefficients were calculated using Note (2) of Table 2.

TIME OF CONCENTRATION

Project Information

Project	County	Date	Project No.
USD Master Plan	San Diego	6/8/2015	038
Location	**Condtion**	**By**	**Checked**
Drainage Basin A1	EXISTING	AMO	MJY

Initial Time (T_i)

Segment ID		AB				
Flow Length, D	ft	70				
Land Slope, S	ft/ft	0.015				
Runoff Coefficient, C		0.53				
Travel Time, Ti	hr	0.125	+		=	0.125

Shallow Concentrated Flow

Segment ID		BC						
Surface Description		P						
Flow Length, L	ft	150						
Watercourse Slope, S	ft/ft	0.015						
Average Velocity, V	ft/s	2.490						
Travel Time, T_t	hr	0.017	+		+		+	
				Combined Travel Time, T_t	=	0.017		

Channel Flow

Segment ID		CD		DE					
Cross Sectional Flow Area, A	ft^2								
Wetted Perimeter, P	ft								
Hydraulic Radius, R	ft								
Channel Slope, S	ft/ft	0.04		0.06	*				
Manning's Roughness Coefficient, n		0.013		0.013					
Velocity, V	ft/s	3.000		17.700					
Flow Length, L	ft	150		2700					
Travel Time, T_t	hr	0.014	+	0.042	+		+		
					Combined Travel Time, T_t	hr	=	0.056	
					Time of Concetration, T_c	**hr**	=	***0.198***	
						min	=	***11.9***	

Legend

Sheet Flow Surface Codes

A	Smooth Surfaces	F	Grass, Dense
B	Fallow (No Residue)	G	Grass, Bermuda
C	Cultivated (< 20% Residue)	H	Woods, Light
D	Cultivated (> 20% Residue)	I	Woods, Dense
E	Grass-Range, Short	J	Range, Natural

Shallow Concentrated Surface Codes

P	Paved	U	Unpaved

Channel Flow Roughness Condtion

A	Clean Earth	D	Dense Brush
B	Short Grass	E	Natural Channel
C	Dense Weeds	F	

TIME OF CONCENTRATION

Project Information

Project	County	Date	Project No.
USD Master Plan	San Diego	6/8/2015	038
Location	**Condtion**	**By**	**Checked**
Drainage Basin B1	EXISTING	AMO	MJY

Initial Time (T_i)

Segment ID		AB				
Flow Length, D	ft	70				
Land Slope, S	ft/ft	0.015				
Runoff Coefficient, C		0.85				
Travel Time, Ti	hr	0.055	+		=	0.055

Shallow Concentrated Flow

Segment ID								
Surface Description								
Flow Length, L	ft							
Watercourse Slope, S	ft/ft							
Average Velocity, V	ft/s							
Travel Time, T_t	hr		+		+		+	
				Combined Travel Time, T_t			=	

Channel Flow

Segment ID		BC		CD					
Cross Sectional Flow Area, A	ft^2								
Wetted Perimeter, P	ft								
Hydraulic Radius, R	ft								
Channel Slope, S	ft/ft	0.015		0.04	*				
Manning's Roughness Coefficient, n		0.013		0.013					
Velocity, V	ft/s	3.000		14.400					
Flow Length, L	ft	150		225					
Travel Time, T_t	hr	0.014	+	0.004	+		+		
					Combined Travel Time, T_t	hr	=	0.018	
					Time of Concetration, T_c	**hr**	=	***0.073***	
						min*	=	***5.0***	

* Minimum 5 min Tc used

Legend

Sheet Flow Surface Codes

A	Smooth Surfaces	F	Grass, Dense
B	Fallow (No Residue)	G	Grass, Bermuda
C	Cultivated (< 20% Residue)	H	Woods, Light
D	Cultivated (> 20% Residue)	I	Woods, Dense
E	Grass-Range, Short	J	Range, Natural

Shallow Concentrated Surface Codes

P	Paved	U	Unpaved

Channel Flow Roughness Condtion

A	Clean Earth	D	Dense Brush
B	Short Grass	E	Natural Channel
C	Dense Weeds	F	

TIME OF CONCENTRATION

Project Information

Project	County	Date	Project No.
USD Master Plan	San Diego	6/8/2015	038
Location	**Condtion**	**By**	**Checked**
Drainage Basin C1	EXISTING	AMO	MJY

Initial Time (T_i)

Segment ID		AB				
Flow Length, D	ft	80				
Land Slope, S	ft/ft	0.01				
Runoff Coefficient, C		0.65				
Travel Time, Ti	hr	0.122	+		=	0.122

Shallow Concentrated Flow

Segment ID		BC						
Surface Description		P						
Flow Length, L	ft	140						
Watercourse Slope, S	ft/ft	0.015						
Average Velocity, V	ft/s	2.490						
Travel Time, T_t	hr	0.016	+		+		+	
				Combined Travel Time, T_t	=	0.016		

Channel Flow

Segment ID		CD						
Cross Sectional Flow Area, A	ft^2							
Wetted Perimeter, P	ft							
Hydraulic Radius, R	ft							
Channel Slope, S	ft/ft	0.11	*					
Manning's Roughness Coefficient, n		0.013						
Velocity, V	ft/s	23.900						
Flow Length, L	ft	1300						
Travel Time, T_t	hr	0.015	+		+		+	
				Combined Travel Time, T_t	hr	=	0.015	
				Time of Concetration, T_c	**hr**	=	***0.152***	
					min	=	***9.1***	

Legend

Sheet Flow Surface Codes

A	Smooth Surfaces	F	Grass, Dense
B	Fallow (No Residue)	G	Grass, Bermuda
C	Cultivated (< 20% Residue)	H	Woods, Light
D	Cultivated (> 20% Residue)	I	Woods, Dense
E	Grass-Range, Short	J	Range, Natural

Shallow Concentrated Surface Codes

P	Paved	U	Unpaved

Channel Flow Roughness Condtion

A	Clean Earth	D	Dense Brush
B	Short Grass	E	Natural Channel
C	Dense Weeds	F	

TIME OF CONCENTRATION

Project Information

Project	County	Date	Project No.
USD Master Plan	San Diego	6/8/2015	038
Location	**Condtion**	**By**	**Checked**
Drainage Basin D1	EXISTING	AMO	MJY

Initial Time (T_i)

Segment ID		AB				
Flow Length, D	ft	80				
Land Slope, S	ft/ft	0.025				
Runoff Coefficient, C		0.50				
Travel Time, Ti	hr	0.119	+		=	0.119

Shallow Concentrated Flow

Segment ID		BC						
Surface Description		P						
Flow Length, L	ft	110						
Watercourse Slope, S	ft/ft	0.015						
Average Velocity, V	ft/s	2.490						
Travel Time, T_t	hr	0.012	+		+		+	
				Combined Travel Time, T_t	=	0.012		

Channel Flow

Segment ID		CD		DE				
Cross Sectional Flow Area, A	ft^2							
Wetted Perimeter, P	ft							
Hydraulic Radius, R	ft							
Channel Slope, S	ft/ft	0.07	*	0.33				
Manning's Roughness Coefficient, n		0.013		0.013				
Velocity, V	ft/s	5.500		38.200				
Flow Length, L	ft	340		130				
Travel Time, T_t	hr	0.017	+	0.001	+		+	
				Combined Travel Time, T_t	hr	=	0.018	
				Time of Concetration, T_c	**hr**	=	***0.149***	
					min	=	***8.9***	

Legend

Sheet Flow Surface Codes

A	Smooth Surfaces	F	Grass, Dense
B	Fallow (No Residue)	G	Grass, Bermuda
C	Cultivated (< 20% Residue)	H	Woods, Light
D	Cultivated (> 20% Residue)	I	Woods, Dense
E	Grass-Range, Short	J	Range, Natural

Shallow Concentrated Surface Codes

P	Paved	U	Unpaved

Channel Flow Roughness Condtion

A	Clean Earth	D	Dense Brush
B	Short Grass	E	Natural Channel
C	Dense Weeds	F	

TIME OF CONCENTRATION

Project Information

Project	County	Date	Project No.
USD Master Plan	San Diego	6/8/2015	038
Location	**Condtion**	**By**	**Checked**
Drainage Basin E1	EXISTING	AMO	MJY

Initial Time (T_i)

Segment ID		AB				
Flow Length, D	ft	50				
Land Slope, S	ft/ft	0.02				
Runoff Coefficient, C		0.50				
Travel Time, Ti	hr	0.101	+		=	0.101

Shallow Concentrated Flow

Segment ID		BC						
Surface Description		P						
Flow Length, L	ft	110						
Watercourse Slope, S	ft/ft	0.02						
Average Velocity, V	ft/s	2.875						
Travel Time, T_t	hr	0.011	+		+		+	
				Combined Travel Time, T_t	=	0.011		

Channel Flow

Segment ID		CD		DE				
Cross Sectional Flow Area, A	ft^2							
Wetted Perimeter, P	ft							
Hydraulic Radius, R	ft							
Channel Slope, S	ft/ft	0.02		0.33				
Manning's Roughness Coefficient, n		0.013		0.035				
Velocity, V	ft/s	3.500		14.260				
Flow Length, L	ft	110		100				
Travel Time, T_t	hr	0.009	+	0.002	+		+	
				Combined Travel Time, T_t	hr	=	0.011	
				Time of Concetration, T_c	**hr**	=	***0.122***	
					min	=	***7.3***	

Legend

Sheet Flow Surface Codes

A	Smooth Surfaces	F	Grass, Dense
B	Fallow (No Residue)	G	Grass, Bermuda
C	Cultivated (< 20% Residue)	H	Woods, Light
D	Cultivated (> 20% Residue)	I	Woods, Dense
E	Grass-Range, Short	J	Range, Natural

Shallow Concentrated Surface Codes

P	Paved	U	Unpaved

Channel Flow Roughness Condtion

A	Clean Earth	D	Dense Brush
B	Short Grass	E	Natural Channel
C	Dense Weeds	F	

TIME OF CONCENTRATION

Project Information

Project	County	Date	Project No.
USD Master Plan	San Diego	6/8/2015	038
Location	**Condtion**	**By**	**Checked**
Drainage Basin F1	EXISTING	AMO	MJY

Initial Time (T_i)

Segment ID		AB				
Flow Length, D	ft	60				
Land Slope, S	ft/ft	0.02				
Runoff Coefficient, C		0.58				
Travel Time, Ti	hr	0.095	+		=	0.095

Shallow Concentrated Flow

Segment ID								
Surface Description								
Flow Length, L	ft							
Watercourse Slope, S	ft/ft							
Average Velocity, V	ft/s							
Travel Time, T_t	hr		+		+		+	
				Combined Travel Time, T_t	=			

Channel Flow

Segment ID		BC		CD		DE		EF	
Cross Sectional Flow Area, A	ft^2								
Wetted Perimeter, P	ft								
Hydraulic Radius, R	ft								
Channel Slope, S	ft/ft	0.03	*	0.15	*	0.07	*	0.04	*
Manning's Roughness Coefficient, n		0.013		0.013		0.035		0.013	
Velocity, V	ft/s	4.000		27.900		10.400		14.400	
Flow Length, L	ft	1200		420		1070		1040	
Travel Time, T_t	hr	0.083	+	0.004	+	0.029	+	0.020	
				Combined Travel Time, T_t	hr	=		0.136	
				Time of Concetration, T_c	**hr**	=		***0.231***	
					min	=		***13.9***	

Legend

Sheet Flow Surface Codes

A	Smooth Surfaces	F	Grass, Dense
B	Fallow (No Residue)	G	Grass, Bermuda
C	Cultivated (< 20% Residue)	H	Woods, Light
D	Cultivated (> 20% Residue)	I	Woods, Dense
E	Grass-Range, Short	J	Range, Natural

Shallow Concentrated Surface Codes

P	Paved	U	Unpaved

Channel Flow Roughness Condtion

A	Clean Earth	D	Dense Brush
B	Short Grass	E	Natural Channel
C	Dense Weeds	F	

TIME OF CONCENTRATION

Project Information

Project	County	Date	Project No.
USD Master Plan	San Diego	6/8/2015	038
Location	**Condtion**	**By**	**Checked**
Drainage Basin G1	EXISTING	AMO	MJY

Initial Time (T_i)

Segment ID		AB				
Flow Length, D	ft	50				
Land Slope, S	ft/ft	0.02				
Runoff Coefficient, C		0.85				
Travel Time, Ti	hr	0.042	+		=	0.042

Shallow Concentrated Flow

Segment ID										
Surface Description										
Flow Length, L	ft									
Watercourse Slope, S	ft/ft									
Average Velocity, V	ft/s									
Travel Time, T_t	hr		+		+		+			

Combined Travel Time, T_t =

Channel Flow

Segment ID		BC									
Cross Sectional Flow Area, A	ft^2										
Wetted Perimeter, P	ft										
Hydraulic Radius, R	ft										
Channel Slope, S	ft/ft	0.02	*		*		*		*		
Manning's Roughness Coefficient, n		0.013									
Velocity, V	ft/s	3.500									
Flow Length, L	ft	510									
Travel Time, T_t	hr	0.040	+		+		+				

Combined Travel Time, T_t hr = 0.040

Time of Concetration, T_c **hr** = ***0.083***

min* = ***5.0***

* Minimum 5 min Tc used

Legend

Sheet Flow Surface Codes

A	Smooth Surfaces	F	Grass, Dense
B	Fallow (No Residue)	G	Grass, Bermuda
C	Cultivated (< 20% Residue)	H	Woods, Light
D	Cultivated (> 20% Residue)	I	Woods, Dense
E	Grass-Range, Short	J	Range, Natural

Shallow Concentrated Surface Codes

P	Paved	U	Unpaved

Channel Flow Roughness Condtion

A	Clean Earth	D	Dense Brush
B	Short Grass	E	Natural Channel
C	Dense Weeds	F	

TIME OF CONCENTRATION

Project Information

Project	County	Date	Project No.
USD Master Plan	San Diego	6/8/2015	038
Location	**Condtion**	**By**	**Checked**
Drainage Basin H1	EXISTING	AMO	MJY

Initial Time (T_i)

Segment ID		AB				
Flow Length, D	ft	50				
Land Slope, S	ft/ft	0.02				
Runoff Coefficient, C		0.50				
Travel Time, Ti	hr	0.101	+		=	0.101

Shallow Concentrated Flow

Segment ID										
Surface Description										
Flow Length, L	ft									
Watercourse Slope, S	ft/ft									
Average Velocity, V	ft/s									
Travel Time, T_t	hr		+		+		+			

Combined Travel Time, T_t =

Channel Flow

Segment ID		BC									
Cross Sectional Flow Area, A	ft^2										
Wetted Perimeter, P	ft										
Hydraulic Radius, R	ft										
Channel Slope, S	ft/ft	0.08	*		*		*		*		
Manning's Roughness Coefficient, n		0.013									
Velocity, V	ft/s	6.000									
Flow Length, L	ft	1700									
Travel Time, T_t	hr	0.079	+		+		+				

Combined Travel Time, T_t hr = 0.079

Time of Concetration, T_c **hr** = ***0.180***

min = ***10.8***

Legend

Sheet Flow Surface Codes

A	Smooth Surfaces	F	Grass, Dense
B	Fallow (No Residue)	G	Grass, Bermuda
C	Cultivated (< 20% Residue)	H	Woods, Light
D	Cultivated (> 20% Residue)	I	Woods, Dense
E	Grass-Range, Short	J	Range, Natural

Shallow Concentrated Surface Codes

P	Paved	U	Unpaved

Channel Flow Roughness Condtion

A	Clean Earth	D	Dense Brush
B	Short Grass	E	Natural Channel
C	Dense Weeds	F	

TIME OF CONCENTRATION

Project Information

Project	County	Date	Project No.
USD Master Plan	San Diego	6/8/2015	038
Location	**Condtion**	**By**	**Checked**
Drainage Basin I1	EXISTING	AMO	MJY

Initial Time (T_i)

Segment ID		AB				
Flow Length, D	ft	70				
Land Slope, S	ft/ft	0.02				
Runoff Coefficient, C		0.50				
Travel Time, Ti	hr	0.120	+		=	0.120

Shallow Concentrated Flow

Segment ID		BC						
Surface Description		U						
Flow Length, L	ft	40						
Watercourse Slope, S	ft/ft	0.02						
Average Velocity, V	ft/s	2.282						
Travel Time, T_t	hr	0.005	+		+		+	
				Combined Travel Time, T_t	=	0.005		

Channel Flow

Segment ID		CD		DE		EF		FG		
Cross Sectional Flow Area, A	ft^2									
Wetted Perimeter, P	ft									
Hydraulic Radius, R	ft									
Channel Slope, S	ft/ft	0.04	*	0.07	*	0.23	*	0.16	*	
Manning's Roughness Coefficient, n		0.013		0.013		0.013		0.035		
Velocity, V	ft/s	14.400		19.100		34.600		15.800		
Flow Length, L	ft	50		400		150		310		
Travel Time, T_t	hr	0.001	+	0.006	+	0.001	+	0.005		
					Combined Travel Time, T_t	hr	=	0.013		
					Time of Concetration, T_c	**hr**	=	***0.138***		
						min	=	***8.3***		

Legend

Sheet Flow Surface Codes

A	Smooth Surfaces	F	Grass, Dense
B	Fallow (No Residue)	G	Grass, Bermuda
C	Cultivated (< 20% Residue)	H	Woods, Light
D	Cultivated (> 20% Residue)	I	Woods, Dense
E	Grass-Range, Short	J	Range, Natural

Shallow Concentrated Surface Codes

P	Paved	U	Unpaved

Channel Flow Roughness Condtion

A	Clean Earth	D	Dense Brush
B	Short Grass	E	Natural Channel
C	Dense Weeds	F	

TIME OF CONCENTRATION

Project Information

Project	County	Date	Project No.
USD Master Plan	San Diego	6/8/2015	038
Location	**Condtion**	**By**	**Checked**
Drainage Basin J1	EXISTING	AMO	MJY

Initial Time (T_i)

Segment ID		AB				
Flow Length, D	ft	70				
Land Slope, S	ft/ft	0.05				
Runoff Coefficient, C		0.57				
Travel Time, Ti	hr	0.077	+		=	0.077

Shallow Concentrated Flow

Segment ID								
Surface Description								
Flow Length, L	ft							
Watercourse Slope, S	ft/ft							
Average Velocity, V	ft/s							
Travel Time, T_t	hr		+		+		+	
				Combined Travel Time, T_t	=			

Channel Flow

Segment ID		BC		CD		DE		EF	
Cross Sectional Flow Area, A	ft^2								
Wetted Perimeter, P	ft								
Hydraulic Radius, R	ft								
Channel Slope, S	ft/ft	0.04	*	0.02	*	0.43	*	0.11	*
Manning's Roughness Coefficient, n		0.013		0.013		0.013		0.035	
Velocity, V	ft/s	4.500		10.200		47.300		13.100	
Flow Length, L	ft	470		260		135		560	
Travel Time, T_t	hr	0.029	+	0.007	+	0.001	+	0.012	
				Combined Travel Time, T_t	hr	=		0.049	
				Time of Concetration, T_c	**hr**	=		***0.126***	
					min	=		***7.6***	

Legend

Sheet Flow Surface Codes

A	Smooth Surfaces	F	Grass, Dense
B	Fallow (No Residue)	G	Grass, Bermuda
C	Cultivated (< 20% Residue)	H	Woods, Light
D	Cultivated (> 20% Residue)	I	Woods, Dense
E	Grass-Range, Short	J	Range, Natural

Shallow Concentrated Surface Codes

P	Paved	U	Unpaved

Channel Flow Roughness Condtion

A	Clean Earth	D	Dense Brush
B	Short Grass	E	Natural Channel
C	Dense Weeds	F	

TIME OF CONCENTRATION

Project Information

Project	County	Date	Project No.
USD Master Plan	San Diego	6/8/2015	038
Location	**Condtion**	**By**	**Checked**
Drainage Basin K1	EXISTING	AMO	MJY

Initial Time (T_i)

Segment ID		AB				
Flow Length, D	ft	70				
Land Slope, S	ft/ft	0.01				
Runoff Coefficient, C		0.78				
Travel Time, Ti	hr	0.080	+		=	0.080

Shallow Concentrated Flow

Segment ID		BC						
Surface Description		P						
Flow Length, L	ft	200						
Watercourse Slope, S	ft/ft	0.02						
Average Velocity, V	ft/s	2.875						
Travel Time, T_t	hr	0.019	+		+		+	
				Combined Travel Time, T_t	=	0.019		

Channel Flow

Segment ID				CD		DE				
Cross Sectional Flow Area, A	ft^2									
Wetted Perimeter, P	ft									
Hydraulic Radius, R	ft									
Channel Slope, S	ft/ft		*	0.01	*	0.32	*		*	
Manning's Roughness Coefficient, n				0.013		0.013				
Velocity, V	ft/s			2.500		40.800				
Flow Length, L	ft			400		130				
Travel Time, T_t	hr		+	0.044	+	0.001	+			
					Combined Travel Time, T_t	hr	=	0.045		
					Time of Concetration, T_c	**hr**	=	***0.144***		
						min	=	***8.7***		

Legend

Sheet Flow Surface Codes

A	Smooth Surfaces	F	Grass, Dense
B	Fallow (No Residue)	G	Grass, Bermuda
C	Cultivated (< 20% Residue)	H	Woods, Light
D	Cultivated (> 20% Residue)	I	Woods, Dense
E	Grass-Range, Short	J	Range, Natural

Shallow Concentrated Surface Codes

P	Paved	U	Unpaved

Channel Flow Roughness Condtion

A	Clean Earth	D	Dense Brush
B	Short Grass	E	Natural Channel
C	Dense Weeds	F	

TIME OF CONCENTRATION

Project Information

Project	County	Date	Project No.
USD Master Plan	San Diego	6/8/2015	038
Location	**Condtion**	**By**	**Checked**
Drainage Basin L1	DEVELOPED	AMO	MJY

Initial Time (T_i)

Segment ID		AB				
Flow Length, D	ft	70				
Land Slope, S	ft/ft	0.015				
Runoff Coefficient, C		0.54				
Travel Time, Ti	hr	0.122	+		=	0.122

Shallow Concentrated Flow

Segment ID		BC						
Surface Description		P						
Flow Length, L	ft	120						
Watercourse Slope, S	ft/ft	0.015						
Average Velocity, V	ft/s	2.490						
Travel Time, T_t	hr	0.013	+		+		+	
				Combined Travel Time, T_t	=	0.013		

Channel Flow

Segment ID		CD						
Cross Sectional Flow Area, A	ft^2							
Wetted Perimeter, P	ft							
Hydraulic Radius, R	ft							
Channel Slope, S	ft/ft	0.06	*		*			
Manning's Roughness Coefficient, n		0.013						
Velocity, V	ft/s	17.700						
Flow Length, L	ft	2850						
Travel Time, T_t	hr	0.045	+		+		+	
				Combined Travel Time, T_t	hr	=	0.045	
				Time of Concetration, T_c	**hr**	=	***0.180***	
					min	=	***10.8***	

Legend

Sheet Flow Surface Codes

A	Smooth Surfaces	F	Grass, Dense
B	Fallow (No Residue)	G	Grass, Bermuda
C	Cultivated (< 20% Residue)	H	Woods, Light
D	Cultivated (> 20% Residue)	I	Woods, Dense
E	Grass-Range, Short	J	Range, Natural

Shallow Concentrated Surface Codes

P	Paved	U	Unpaved

Channel Flow Roughness Condtion

A	Clean Earth	D	Dense Brush
B	Short Grass	E	Natural Channel
C	Dense Weeds	F	

TIME OF CONCENTRATION

Project Information

Project	County	Date	Project No.
USD Master Plan	San Diego	6/8/2015	038
Location	**Condtion**	**By**	**Checked**
Drainage Basin M1	DEVELOPED	AMO	MJY

Initial Time (T_i)

Segment ID		AB				
Flow Length, D	ft	70				
Land Slope, S	ft/ft	0.015				
Runoff Coefficient, C		0.85				
Travel Time, Ti	hr	0.055	+		=	0.055

Shallow Concentrated Flow

Segment ID								
Surface Description								
Flow Length, L	ft							
Watercourse Slope, S	ft/ft							
Average Velocity, V	ft/s							
Travel Time, T_t	hr		+		+		+	
				Combined Travel Time, T_t			=	

Channel Flow

Segment ID		BC		CD					
Cross Sectional Flow Area, A	ft^2								
Wetted Perimeter, P	ft								
Hydraulic Radius, R	ft								
Channel Slope, S	ft/ft	0.015		0.04	*				
Manning's Roughness Coefficient, n		0.013		0.013					
Velocity, V	ft/s	3.000		14.400					
Flow Length, L	ft	150		225					
Travel Time, T_t	hr	0.014	+	0.004	+		+		
						Combined Travel Time, T_t	hr	=	0.018
						Time of Concetration, T_c	**hr**	=	***0.073***
							min*	=	***5.0***

* Minimum 5 min Tc used

Legend

Sheet Flow Surface Codes

A	Smooth Surfaces	F	Grass, Dense
B	Fallow (No Residue)	G	Grass, Bermuda
C	Cultivated (< 20% Residue)	H	Woods, Light
D	Cultivated (> 20% Residue)	I	Woods, Dense
E	Grass-Range, Short	J	Range, Natural

Shallow Concentrated Surface Codes

P	Paved	U	Unpaved

Channel Flow Roughness Condtion

A	Clean Earth	D	Dense Brush
B	Short Grass	E	Natural Channel
C	Dense Weeds	F	

TIME OF CONCENTRATION

Project Information

Project	County	Date	Project No.
USD Master Plan	San Diego	6/8/2015	038
Location	**Condtion**	**By**	**Checked**
Drainage Basin N1	DEVELOPED	AMO	MJY

Initial Time (T_i)

Segment ID		AB				
Flow Length, D	ft	80				
Land Slope, S	ft/ft	0.01				
Runoff Coefficient, C		0.70				
Travel Time, Ti	hr	0.106	+		=	0.106

Shallow Concentrated Flow

Segment ID		BC						
Surface Description		P						
Flow Length, L	ft	140						
Watercourse Slope, S	ft/ft	0.015						
Average Velocity, V	ft/s	2.490						
Travel Time, T_t	hr	0.016	+		+		+	
				Combined Travel Time, T_t	=	0.016		

Channel Flow

Segment ID		CD						
Cross Sectional Flow Area, A	ft^2							
Wetted Perimeter, P	ft							
Hydraulic Radius, R	ft							
Channel Slope, S	ft/ft	0.11	*					
Manning's Roughness Coefficient, n		0.013						
Velocity, V	ft/s	23.900						
Flow Length, L	ft	1300						
Travel Time, T_t	hr	0.015	+		+		+	
				Combined Travel Time, T_t	hr	=	0.015	
				Time of Concetration, T_c	**hr**	=	***0.137***	
					min	=	***8.2***	

Legend

Sheet Flow Surface Codes

A	Smooth Surfaces	F	Grass, Dense
B	Fallow (No Residue)	G	Grass, Bermuda
C	Cultivated (< 20% Residue)	H	Woods, Light
D	Cultivated (> 20% Residue)	I	Woods, Dense
E	Grass-Range, Short	J	Range, Natural

Shallow Concentrated Surface Codes

P	Paved	U	Unpaved

Channel Flow Roughness Condtion

A	Clean Earth	D	Dense Brush
B	Short Grass	E	Natural Channel
C	Dense Weeds	F	

TIME OF CONCENTRATION

Project Information

Project	County	Date	Project No.
USD Master Plan	San Diego	6/8/2015	038
Location	**Condtion**	**By**	**Checked**
Drainage Basin O1	DEVELOPED	AMO	MJY

Initial Time (T_i)

Segment ID		AB				
Flow Length, D	ft	80				
Land Slope, S	ft/ft	0.025				
Runoff Coefficient, C		0.50				
Travel Time, Ti	hr	0.119	+		=	0.119

Shallow Concentrated Flow

Segment ID		BC						
Surface Description		P						
Flow Length, L	ft	110						
Watercourse Slope, S	ft/ft	0.015						
Average Velocity, V	ft/s	2.490						
Travel Time, T_t	hr	0.012	+		+		+	
				Combined Travel Time, T_t	=	0.012		

Channel Flow

Segment ID		CD		DE				
Cross Sectional Flow Area, A	ft^2							
Wetted Perimeter, P	ft							
Hydraulic Radius, R	ft							
Channel Slope, S	ft/ft	0.07	*	0.33				
Manning's Roughness Coefficient, n		0.013		0.013				
Velocity, V	ft/s	5.500		38.200				
Flow Length, L	ft	340		130				
Travel Time, T_t	hr	0.017	+	0.001	+		+	
				Combined Travel Time, T_t	hr	=	0.018	
				Time of Concetration, T_c	**hr**	=	***0.149***	
					min	=	***8.9***	

Legend

Sheet Flow Surface Codes

A	Smooth Surfaces	F	Grass, Dense
B	Fallow (No Residue)	G	Grass, Bermuda
C	Cultivated (< 20% Residue)	H	Woods, Light
D	Cultivated (> 20% Residue)	I	Woods, Dense
E	Grass-Range, Short	J	Range, Natural

Shallow Concentrated Surface Codes

P	Paved	U	Unpaved

Channel Flow Roughness Condtion

A	Clean Earth	D	Dense Brush
B	Short Grass	E	Natural Channel
C	Dense Weeds	F	

TIME OF CONCENTRATION

Project Information

Project	County	Date	Project No.
USD Master Plan	San Diego	6/8/2015	038
Location	**Condtion**	**By**	**Checked**
Drainage Basin P1	DEVELOPED	AMO	MJY

Initial Time (T_i)

		Segment ID	AB			
Flow Length, D	ft		50			
Land Slope, S	ft/ft		0.02			
Runoff Coefficient, C			0.50			
Travel Time, Ti	hr		0.101	+	=	0.101

Shallow Concentrated Flow

		Segment ID	BC					
Surface Description			P					
Flow Length, L	ft		110					
Watercourse Slope, S	ft/ft		0.02					
Average Velocity, V	ft/s		2.875					
Travel Time, T_t	hr		0.011	+		+	+	

Combined Travel Time, T_t = 0.011

Channel Flow

		Segment ID	CD		DE				
Cross Sectional Flow Area, A	ft^2								
Wetted Perimeter, P	ft								
Hydraulic Radius, R	ft								
Channel Slope, S	ft/ft		0.02		0.33				
Manning's Roughness Coefficient, n			0.013		0.035				
Velocity, V	ft/s		3.500		14.260				
Flow Length, L	ft		110		100				
Travel Time, T_t	hr		0.009	+	0.002	+		+	

Combined Travel Time, T_t hr = 0.011

Time of Concetration, T_c **hr** = ***0.122***

min = ***7.3***

Legend

Sheet Flow Surface Codes

A	Smooth Surfaces	F	Grass, Dense
B	Fallow (No Residue)	G	Grass, Bermuda
C	Cultivated (< 20% Residue)	H	Woods, Light
D	Cultivated (> 20% Residue)	I	Woods, Dense
E	Grass-Range, Short	J	Range, Natural

Shallow Concentrated Surface Codes

P	Paved	U	Unpaved

Channel Flow Roughness Condtion

A	Clean Earth	D	Dense Brush
B	Short Grass	E	Natural Channel
C	Dense Weeds	F	

TIME OF CONCENTRATION

Project Information

Project	County	Date	Project No.
USD Master Plan	San Diego	6/8/2015	038
Location	**Condtion**	**By**	**Checked**
Drainage Basin Q1	DEVELOPED	AMO	MJY

Initial Time (T_i)

Segment ID		AB				
Flow Length, D	ft	60				
Land Slope, S	ft/ft	0.02				
Runoff Coefficient, C		0.63				
Travel Time, Ti	hr	0.087	+		=	0.087

Shallow Concentrated Flow

Segment ID										
Surface Description										
Flow Length, L	ft									
Watercourse Slope, S	ft/ft									
Average Velocity, V	ft/s									
Travel Time, T_t	hr		+		+		+			

Combined Travel Time, T_t =

Channel Flow

Segment ID		BC		CD		DE		EF				
Cross Sectional Flow Area, A	ft^2											
Wetted Perimeter, P	ft											
Hydraulic Radius, R	ft											
Channel Slope, S	ft/ft	0.03	*	0.15	*	0.07	*	0.04	*			
Manning's Roughness Coefficient, n		0.013		0.013		0.035		0.013				
Velocity, V	ft/s	4.000		27.900		10.400		14.400				
Flow Length, L	ft	1200		420		1070		1040				
Travel Time, T_t	hr	0.083	+	0.004	+	0.029	+	0.020				

Combined Travel Time, T_t hr = 0.136

Time of Concetration, T_c **hr** = ***0.223***

min = ***13.4***

Legend

Sheet Flow Surface Codes

A	Smooth Surfaces	F	Grass, Dense
B	Fallow (No Residue)	G	Grass, Bermuda
C	Cultivated (< 20% Residue)	H	Woods, Light
D	Cultivated (> 20% Residue)	I	Woods, Dense
E	Grass-Range, Short	J	Range, Natural

Shallow Concentrated Surface Codes

P	Paved	U	Unpaved

Channel Flow Roughness Condtion

A	Clean Earth	D	Dense Brush
B	Short Grass	E	Natural Channel
C	Dense Weeds	F	

TIME OF CONCENTRATION

Project Information

Project	County	Date	Project No.
USD Master Plan	San Diego	6/8/2015	038
Location	**Condtion**	**By**	**Checked**
Drainage Basin R1	DEVELOPED	AMO	MJY

Initial Time (T_i)

Segment ID		AB				
Flow Length, D	ft	50				
Land Slope, S	ft/ft	0.02				
Runoff Coefficient, C		0.85				
Travel Time, Ti	hr	0.042	+		=	0.042

Shallow Concentrated Flow

Segment ID										
Surface Description										
Flow Length, L	ft									
Watercourse Slope, S	ft/ft									
Average Velocity, V	ft/s									
Travel Time, T_t	hr		+		+		+			

Combined Travel Time, T_t =

Channel Flow

Segment ID		BC									
Cross Sectional Flow Area, A	ft^2										
Wetted Perimeter, P	ft										
Hydraulic Radius, R	ft										
Channel Slope, S	ft/ft	0.02	*		*		*		*		
Manning's Roughness Coefficient, n		0.013									
Velocity, V	ft/s	3.500									
Flow Length, L	ft	510									
Travel Time, T_t	hr	0.040	+		+		+				

Combined Travel Time, T_t hr = 0.040

Time of Concetration, T_c **hr** = ***0.083***

min* = ***5.0***

* Minimum 5 min Tc used

Legend

Sheet Flow Surface Codes

A	Smooth Surfaces	F	Grass, Dense
B	Fallow (No Residue)	G	Grass, Bermuda
C	Cultivated (< 20% Residue)	H	Woods, Light
D	Cultivated (> 20% Residue)	I	Woods, Dense
E	Grass-Range, Short	J	Range, Natural

Shallow Concentrated Surface Codes

P	Paved	U	Unpaved

Channel Flow Roughness Condtion

A	Clean Earth	D	Dense Brush
B	Short Grass	E	Natural Channel
C	Dense Weeds	F	

TIME OF CONCENTRATION

Project Information

Project	County	Date	Project No.
USD Master Plan	San Diego	6/8/2015	038
Location	**Condtion**	**By**	**Checked**
Drainage Basin S1	DEVELOPED	AMO	MJY

Initial Time (T_i)

Segment ID		AB				
Flow Length, D	ft	50				
Land Slope, S	ft/ft	0.02				
Runoff Coefficient, C		0.50				
Travel Time, Ti	hr	0.101	+		=	0.101

Shallow Concentrated Flow

Segment ID								
Surface Description								
Flow Length, L	ft							
Watercourse Slope, S	ft/ft							
Average Velocity, V	ft/s							
Travel Time, T_t	hr		+		+		+	

Combined Travel Time, T_t =

Channel Flow

Segment ID		BC							
Cross Sectional Flow Area, A	ft^2								
Wetted Perimeter, P	ft								
Hydraulic Radius, R	ft								
Channel Slope, S	ft/ft	0.08	*		*		*		*
Manning's Roughness Coefficient, n		0.013							
Velocity, V	ft/s	6.000							
Flow Length, L	ft	1700							
Travel Time, T_t	hr	0.079	+		+		+		

Combined Travel Time, T_t hr = 0.079

Time of Concetration, T_c **hr** = ***0.180***

min = ***10.8***

Legend

Sheet Flow Surface Codes

A	Smooth Surfaces	F	Grass, Dense
B	Fallow (No Residue)	G	Grass, Bermuda
C	Cultivated (< 20% Residue)	H	Woods, Light
D	Cultivated (> 20% Residue)	I	Woods, Dense
E	Grass-Range, Short	J	Range, Natural

Shallow Concentrated Surface Codes

P	Paved	U	Unpaved

Channel Flow Roughness Condtion

A	Clean Earth	D	Dense Brush
B	Short Grass	E	Natural Channel
C	Dense Weeds	F	

TIME OF CONCENTRATION

Project Information

Project	County	Date	Project No.
USD Master Plan	San Diego	6/8/2015	038
Location	**Condtion**	**By**	**Checked**
Drainage Basin T1	DEVELOPED	AMO	MJY

Initial Time (T_i)

Segment ID		AB				
Flow Length, D	ft	70				
Land Slope, S	ft/ft	0.02				
Runoff Coefficient, C		0.50				
Travel Time, Ti	hr	0.120	+		=	0.120

Shallow Concentrated Flow

Segment ID		BC						
Surface Description		U						
Flow Length, L	ft	40						
Watercourse Slope, S	ft/ft	0.02						
Average Velocity, V	ft/s	2.282						
Travel Time, T_t	hr	0.005	+		+		+	
				Combined Travel Time, T_t	=	0.005		

Channel Flow

Segment ID		CD		DE		EF		FG		
Cross Sectional Flow Area, A	ft^2									
Wetted Perimeter, P	ft									
Hydraulic Radius, R	ft									
Channel Slope, S	ft/ft	0.04	*	0.07	*	0.23	*	0.16	*	
Manning's Roughness Coefficient, n		0.013		0.013		0.013		0.035		
Velocity, V	ft/s	14.400		19.100		34.600		15.800		
Flow Length, L	ft	50		400		150		310		
Travel Time, T_t	hr	0.001	+	0.006	+	0.001	+	0.005		
					Combined Travel Time, T_t	hr	=	0.013		
					Time of Concetration, T_c	**hr**	=	***0.138***		
						min	=	***8.3***		

Legend

Sheet Flow Surface Codes

A	Smooth Surfaces	F	Grass, Dense
B	Fallow (No Residue)	G	Grass, Bermuda
C	Cultivated (< 20% Residue)	H	Woods, Light
D	Cultivated (> 20% Residue)	I	Woods, Dense
E	Grass-Range, Short	J	Range, Natural

Shallow Concentrated Surface Codes

P	Paved	U	Unpaved

Channel Flow Roughness Condtion

A	Clean Earth	D	Dense Brush
B	Short Grass	E	Natural Channel
C	Dense Weeds	F	

TIME OF CONCENTRATION

Project Information

Project	County	Date	Project No.
USD Master Plan	San Diego	6/8/2015	038
Location	**Condtion**	**By**	**Checked**
Drainage Basin U1	DEVELOPED	AMO	MJY

Initial Time (T_i)

Segment ID		AB				
Flow Length, D	ft	70				
Land Slope, S	ft/ft	0.05				
Runoff Coefficient, C		0.68				
Travel Time, Ti	hr	0.062	+		=	0.062

Shallow Concentrated Flow

Segment ID								
Surface Description								
Flow Length, L	ft							
Watercourse Slope, S	ft/ft							
Average Velocity, V	ft/s							
Travel Time, T_t	hr		+		+		+	
				Combined Travel Time, T_t	=			

Channel Flow

Segment ID		BC		CD		DE		EF	
Cross Sectional Flow Area, A	ft^2								
Wetted Perimeter, P	ft								
Hydraulic Radius, R	ft								
Channel Slope, S	ft/ft	0.04	*	0.03	*	0.29	*	0.06	*
Manning's Roughness Coefficient, n		0.013		0.013		0.013		0.035	
Velocity, V	ft/s	4.500		12.500		38.800		6.100	
Flow Length, L	ft	470		600		290		340	
Travel Time, T_t	hr	0.029	+	0.013	+	0.002	+	0.015	
				Combined Travel Time, T_t	hr	=		0.060	
				Time of Concetration, T_c	**hr**	=		***0.122***	
					min	=		***7.3***	

Legend

Sheet Flow Surface Codes

A	Smooth Surfaces	F	Grass, Dense
B	Fallow (No Residue)	G	Grass, Bermuda
C	Cultivated (< 20% Residue)	H	Woods, Light
D	Cultivated (> 20% Residue)	I	Woods, Dense
E	Grass-Range, Short	J	Range, Natural

Shallow Concentrated Surface Codes

P	Paved	U	Unpaved

Channel Flow Roughness Condtion

A	Clean Earth	D	Dense Brush
B	Short Grass	E	Natural Channel
C	Dense Weeds	F	

Channel Flow Velocity Calculations

Depth	Q	Area	Veloc	Wp	Yc	TopWidth
(ft)	(cfs)	(sqft)	(ft/s)	(ft)	(ft)	(ft)
0.20	1.065	0.165	6.47	1.29	0.01	1.20
0.40	4.476	0.451	9.93	1.86	0.36	1.60
0.60	9.924	0.794	12.50	2.32	0.75	1.83
0.80	17.06	1.175	14.53	2.74	1.13	1.96
1.00	25.47	1.579	16.13	3.15	1.49	2.00
1.20	34.10	1.974	17.28	3.55	1.78	1.96
1.40	42.44	2.353	18.03	3.97	1.92	1.83
1.60	49.45	2.695	18.35	4.43	1.97	1.60
1.80	53.92	2.979	18.10	5.00	1.98	1.20
2.00	50.57	3.142	16.10	6.28	1.99	0.00

Depth	Q	Area	Veloc	Wp	Yc	TopWidth
(ft)	(cfs)	(sqft)	(ft/s)	(ft)	(ft)	(ft)
0.20	0.953	0.165	5.79	1.29	0.01	1.20
0.40	4.004	0.451	8.88	1.86	0.34	1.60
0.60	8.876	0.794	11.18	2.32	0.70	1.83
0.80	15.26	1.175	12.99	2.74	1.06	1.96
1.00	22.78	1.579	14.42	3.15	1.41	2.00
1.20	30.50	1.974	15.45	3.55	1.70	1.96
1.40	37.96	2.353	16.13	3.97	1.87	1.83
1.60	44.23	2.695	16.41	4.43	1.95	1.60
1.80	48.23	2.979	16.19	5.00	1.97	1.20
2.00	45.23	3.142	14.40	6.28	1.98	0.00

Depth	Q	Area	Veloc	Wp	Yc	TopWidth
(ft)	(cfs)	(sqft)	(ft/s)	(ft)	(ft)	(ft)
0.20	1.580	0.165	9.60	1.29	0.01	1.20
0.40	6.640	0.451	14.73	1.86	0.44	1.60
0.60	14.72	0.794	18.54	2.32	0.91	1.83
0.80	25.31	1.175	21.55	2.74	1.38	1.96
1.00	37.77	1.579	23.92	3.15	1.77	2.00
1.20	50.58	1.974	25.63	3.55	1.94	1.96
1.40	62.95	2.353	26.75	3.97	1.99	1.83
1.60	73.35	2.695	27.22	4.43	2.00	1.60
1.80	79.97	2.979	26.84	5.00	2.00	1.20
2.00	75.01	3.142	23.88	6.28	2.00	0.00

Depth	Q	Area	Veloc	Wp	Yc	TopWidth	Energy
(ft)	(cfs)	(sqft)	(ft/s)	(ft)	(ft)	(ft)	(ft)
0.15	1.271	0.093	13.73	0.97	0.01	0.90	3.08
0.30	5.339	0.254	21.06	1.39	0.42	1.20	7.19
0.45	11.84	0.447	26.51	1.74	0.89	1.38	11.37
0.60	20.35	0.661	30.81	2.05	1.31	1.47	15.35
0.75	30.38	0.888	34.20	2.36	1.47	1.50	18.93
0.90	40.67	1.110	36.64	2.66	1.50	1.47	21.77
1.05	50.62	1.324	38.24	2.98	1.50	1.37	23.79
1.20	58.99	1.516	38.91	3.32	1.50	1.20	24.74
1.35	64.31	1.676	38.37	3.75	1.50	0.90	24.24
1.50	60.32	1.767	34.14	4.71	1.50	0.00	19.62

Depth	Q	Area	Veloc	Wp	Yc	TopWidth	Energy
(ft)	(cfs)	(sqft)	(ft/s)	(ft)	(ft)	(ft)	(ft)
0.50	4.490	0.500	8.98	2.24	0.01	2.00	1.75
1.00	28.52	2.000	14.26	4.47	0.80	4.00	4.16
1.50	84.09	4.500	18.69	6.71	1.67	6.00	6.93
2.00	181.1	8.000	22.64	8.94	2.56	8.00	9.97
2.50	328.4	12.50	26.27	11.18	3.48	10.00	13.23
3.00	534.1	18.00	29.67	13.42	4.42	12.00	16.69
3.50	805.7	24.50	32.88	15.65	5.00	14.00	20.31
4.00	1,150	32.00	35.95	17.89	5.00	16.00	24.09
4.50	1,575	40.50	38.89	20.12	5.00	18.00	28.01
5.00	2,086	50.00	41.72	22.36	5.00	20.00	32.06

Depth	Q	Area	Veloc	Wp	Yc	TopWidth	Energy
(ft)	(cfs)	(sqft)	(ft/s)	(ft)	(ft)	(ft)	(ft)
0.20	1.845	0.165	11.21	1.29	0.01	1.20	2.15
0.40	7.753	0.451	17.20	1.86	0.47	1.60	5.00
0.60	17.19	0.794	21.65	2.32	0.99	1.83	7.89
0.80	29.55	1.175	25.16	2.74	1.50	1.96	10.64
1.00	44.11	1.579	27.93	3.15	1.86	2.00	13.13
1.20	59.06	1.974	29.93	3.55	1.97	1.96	15.12
1.40	73.51	2.353	31.24	3.97	1.99	1.83	16.57
1.60	85.66	2.695	31.78	4.43	2.00	1.60	17.30
1.80	93.39	2.979	31.34	5.00	2.00	1.20	17.07
2.00	87.60	3.142	27.88	6.28	2.00	0.00	14.09

Depth	Q	Area	Veloc	Wp	Yc	TopWidth	Energy
(ft)	(cfs)	(sqft)	(ft/s)	(ft)	(ft)	(ft)	(ft)
0.50	2.068	0.500	4.14	2.24	0.01	2.00	0.77
1.00	13.13	2.000	6.57	4.47	0.59	4.00	1.67
1.50	38.73	4.500	8.61	6.71	1.22	6.00	2.65
2.00	83.42	8.000	10.43	8.94	1.88	8.00	3.69
2.50	151.3	12.50	12.10	11.18	2.56	10.00	4.78
3.00	246.0	18.00	13.67	13.42	3.24	12.00	5.90
3.50	371.1	24.50	15.15	15.65	3.94	14.00	7.07
4.00	529.8	32.00	16.56	17.89	4.64	16.00	8.26
4.50	725.3	40.50	17.91	20.12	5.00	18.00	9.49
5.00	960.7	50.00	19.21	22.36	5.00	20.00	10.74

Depth	Q	Area	Veloc	Wp	Yc	TopWidth	Energy
(ft)	(cfs)	(sqft)	(ft/s)	(ft)	(ft)	(ft)	(ft)
0.20	0.953	0.165	5.79	1.29	0.01	1.20	0.72
0.40	4.004	0.451	8.88	1.86	0.34	1.60	1.63
0.60	8.876	0.794	11.18	2.32	0.70	1.83	2.54
0.80	15.26	1.175	12.99	2.74	1.06	1.96	3.42
1.00	22.78	1.579	14.42	3.15	1.41	2.00	4.23
1.20	30.50	1.974	15.45	3.55	1.70	1.96	4.91
1.40	37.96	2.353	16.13	3.97	1.87	1.83	5.45
1.60	44.23	2.695	16.41	4.43	1.95	1.60	5.79
1.80	48.23	2.979	16.19	5.00	1.97	1.20	5.87
2.00	45.23	3.142	14.40	6.28	1.98	0.00	5.22

Depth	Q	Area	Veloc	Wp	Yc	TopWidth	Energy
(ft)	(cfs)	(sqft)	(ft/s)	(ft)	(ft)	(ft)	(ft)
0.20	0.953	0.165	5.79	1.29	0.01	1.20	0.72
0.40	4.004	0.451	8.88	1.86	0.34	1.60	1.63
0.60	8.876	0.794	11.18	2.32	0.70	1.83	2.54
0.80	15.26	1.175	12.99	2.74	1.06	1.96	3.42
1.00	22.78	1.579	14.42	3.15	1.41	2.00	4.23
1.20	30.50	1.974	15.45	3.55	1.70	1.96	4.91
1.40	37.96	2.353	16.13	3.97	1.87	1.83	5.45
1.60	44.23	2.695	16.41	4.43	1.95	1.60	5.79
1.80	48.23	2.979	16.19	5.00	1.97	1.20	5.87
2.00	45.23	3.142	14.40	6.28	1.98	0.00	5.22

Depth	Q	Area	Veloc	Wp	Yc	TopWidth	Energy
(ft)	(cfs)	(sqft)	(ft/s)	(ft)	(ft)	(ft)	(ft)
0.20	1.261	0.165	7.66	1.29	0.01	1.20	1.11
0.40	5.297	0.451	11.75	1.86	0.39	1.60	2.55
0.60	11.74	0.794	14.79	2.32	0.82	1.83	4.00
0.80	20.19	1.175	17.19	2.74	1.23	1.96	5.39
1.00	30.13	1.579	19.08	3.15	1.62	2.00	6.66
1.20	40.35	1.974	20.44	3.55	1.87	1.96	7.70
1.40	50.22	2.353	21.34	3.97	1.96	1.83	8.48
1.60	58.52	2.695	21.71	4.43	1.98	1.60	8.93
1.80	63.80	2.979	21.41	5.00	1.99	1.20	8.93
2.00	59.84	3.142	19.05	6.28	2.00	0.00	7.64

Depth	Q	Area	Veloc	Wp	Yc	TopWidth	Energy
(ft)	(cfs)	(sqft)	(ft/s)	(ft)	(ft)	(ft)	(ft)
0.20	2.285	0.165	13.88	1.29	0.01	1.20	3.20
0.40	9.601	0.451	21.30	1.86	0.53	1.60	7.45
0.60	21.28	0.794	26.81	2.32	1.11	1.83	11.77
0.80	36.60	1.175	31.16	2.74	1.66	1.96	15.89
1.00	54.62	1.579	34.59	3.15	1.94	2.00	19.60
1.20	73.13	1.974	37.06	3.55	1.99	1.96	22.55
1.40	91.03	2.353	38.68	3.97	2.00	1.83	24.66
1.60	106.1	2.695	39.35	4.43	2.00	1.60	25.68
1.80	115.6	2.979	38.81	5.00	2.00	1.20	25.22
2.00	108.5	3.142	34.53	6.28	2.00	0.00	20.53

Depth	Q	Area	Veloc	Wp	Yc	TopWidth
(ft)	(cfs)	(sqft)	(ft/s)	(ft)	(ft)	(ft)
0.50	3.127	0.500	6.25	2.24	0.01	2.00
1.00	19.86	2.000	9.93	4.47	0.69	4.00
1.50	58.56	4.500	13.01	6.71	1.44	6.00
2.00	126.1	8.000	15.76	8.94	2.22	8.00
2.50	228.7	12.50	18.29	11.18	3.02	10.00
3.00	371.9	18.00	20.66	13.42	3.82	12.00
3.50	561.0	24.50	22.90	15.65	4.64	14.00
4.00	801.0	32.00	25.03	17.89	5.00	16.00
4.50	1,097	40.50	27.08	20.12	5.00	18.00
5.00	1,452	50.00	29.05	22.36	5.00	20.00

Depth	Q	Area	Veloc	Wp	Yc	TopWidth	Energy
(ft)	(cfs)	(sqft)	(ft/s)	(ft)	(ft)	(ft)	(ft)
0.20	0.674	0.165	4.09	1.29	0.01	1.20	0.46
0.40	2.831	0.451	6.28	1.86	0.28	1.60	1.01
0.60	6.276	0.794	7.91	2.32	0.59	1.83	1.57
0.80	10.79	1.175	9.19	2.74	0.89	1.96	2.11
1.00	16.11	1.579	10.20	3.15	1.18	2.00	2.62
1.20	21.57	1.974	10.93	3.55	1.45	1.96	3.06
1.40	26.84	2.353	11.41	3.97	1.66	1.83	3.42
1.60	31.28	2.695	11.60	4.43	1.81	1.60	3.69
1.80	34.10	2.979	11.45	5.00	1.88	1.20	3.84
2.00	31.99	3.142	10.18	6.28	1.92	0.00	3.61

Depth	Q	Area	Veloc	Wp	Yc	TopWidth	Energy
(ft)	(cfs)	(sqft)	(ft/s)	(ft)	(ft)	(ft)	(ft)
0.20	3.124	0.165	18.98	1.29	0.01	1.20	5.80
0.40	13.13	0.451	29.12	1.86	0.62	1.60	13.59
0.60	29.10	0.794	36.66	2.32	1.30	1.83	21.49
0.80	50.04	1.175	42.60	2.74	1.85	1.96	29.02
1.00	74.68	1.579	47.29	3.15	1.98	2.00	35.77
1.20	100.00	1.974	50.67	3.55	2.00	1.96	41.12
1.40	124.5	2.353	52.89	3.97	2.00	1.83	44.88
1.60	145.0	2.695	53.81	4.43	2.00	1.60	46.62
1.80	158.1	2.979	53.07	5.00	2.00	1.20	45.59
2.00	148.3	3.142	47.21	6.28	2.00	0.00	36.65

Depth	Q	Area	Veloc	Wp	Yc	TopWidth	Energy
(ft)	(cfs)	(sqft)	(ft/s)	(ft)	(ft)	(ft)	(ft)
0.50	2.593	0.500	5.19	2.24	0.01	2.00	0.92
1.00	16.47	2.000	8.23	4.47	0.64	4.00	2.05
1.50	48.55	4.500	10.79	6.71	1.34	6.00	3.31
2.00	104.6	8.000	13.07	8.94	2.06	8.00	4.66
2.50	189.6	12.50	15.17	11.18	2.80	10.00	6.08
3.00	308.4	18.00	17.13	13.42	3.55	12.00	7.56
3.50	465.2	24.50	18.99	15.65	4.31	14.00	9.10
4.00	664.1	32.00	20.75	17.89	5.00	16.00	10.70
4.50	909.3	40.50	22.45	20.12	5.00	18.00	12.34
5.00	1,204	50.00	24.09	22.36	5.00	20.00	14.02

Depth	Q	Area	Veloc	Wp	Yc	TopWidth	Energy
(ft)	(cfs)	(sqft)	(ft/s)	(ft)	(ft)	(ft)	(ft)
0.20	2.695	0.165	16.38	1.29	0.01	1.20	4.37
0.40	11.32	0.451	25.12	1.86	0.57	1.60	10.21
0.60	25.11	0.794	31.62	2.32	1.21	1.83	16.15
0.80	43.17	1.175	36.75	2.74	1.77	1.96	21.80
1.00	64.43	1.579	40.80	3.15	1.97	2.00	26.88
1.20	86.27	1.974	43.71	3.55	2.00	1.96	30.90
1.40	107.4	2.353	45.62	3.97	2.00	1.83	33.76
1.60	125.1	2.695	46.42	4.43	2.00	1.60	35.10
1.80	136.4	2.979	45.78	5.00	2.00	1.20	34.39
2.00	127.9	3.142	40.73	6.28	2.00	0.00	27.79

Depth	Q	Area	Veloc	Wp	Yc	TopWidth	Energy
(ft)	(cfs)	(sqft)	(ft/s)	(ft)	(ft)	(ft)	(ft)
0.20	1.167	0.165	7.09	1.29	0.01	1.20	0.98
0.40	4.904	0.451	10.88	1.86	0.38	1.60	2.24
0.60	10.87	0.794	13.69	2.32	0.78	1.83	3.52
0.80	18.69	1.175	15.91	2.74	1.18	1.96	4.74
1.00	27.90	1.579	17.67	3.15	1.56	2.00	5.85
1.20	37.35	1.974	18.93	3.55	1.83	1.96	6.77
1.40	46.49	2.353	19.76	3.97	1.94	1.83	7.47
1.60	54.17	2.695	20.10	4.43	1.98	1.60	7.88
1.80	59.06	2.979	19.82	5.00	1.99	1.20	7.91
2.00	55.40	3.142	17.63	6.28	1.99	0.00	6.83

Depth	Q	Area	Veloc	Wp	Yc	TopWidth	Energy
(ft)	(cfs)	(sqft)	(ft/s)	(ft)	(ft)	(ft)	(ft)
0.20	0.953	0.165	5.79	1.29	0.01	1.20	0.72
0.40	4.004	0.451	8.88	1.86	0.34	1.60	1.63
0.60	8.876	0.794	11.18	2.32	0.70	1.83	2.54
0.80	15.26	1.175	12.99	2.74	1.06	1.96	3.42
1.00	22.78	1.579	14.42	3.15	1.41	2.00	4.23
1.20	30.50	1.974	15.45	3.55	1.70	1.96	4.91
1.40	37.96	2.353	16.13	3.97	1.87	1.83	5.45
1.60	44.23	2.695	16.41	4.43	1.95	1.60	5.79
1.80	48.23	2.979	16.19	5.00	1.97	1.20	5.87
2.00	45.23	3.142	14.40	6.28	1.98	0.00	5.22

Depth	Q	Area	Veloc	Wp	Yc	TopWidth	Energy
(ft)	(cfs)	(sqft)	(ft/s)	(ft)	(ft)	(ft)	(ft)
0.20	1.580	0.165	9.60	1.29	0.01	1.20	1.63
0.40	6.640	0.451	14.73	1.86	0.44	1.60	3.77
0.60	14.72	0.794	18.54	2.32	0.91	1.83	5.94
0.80	25.31	1.175	21.55	2.74	1.38	1.96	8.02
1.00	37.77	1.579	23.92	3.15	1.77	2.00	9.90
1.20	50.58	1.974	25.63	3.55	1.94	1.96	11.41
1.40	62.95	2.353	26.75	3.97	1.99	1.83	12.52
1.60	73.35	2.695	27.22	4.43	2.00	1.60	13.12
1.80	79.97	2.979	26.84	5.00	2.00	1.20	13.00
2.00	75.01	3.142	23.88	6.28	2.00	0.00	10.86

Depth	Q	Area	Veloc	Wp	Yc	TopWidth	Energy
(ft)	(cfs)	(sqft)	(ft/s)	(ft)	(ft)	(ft)	(ft)
0.15	1.271	0.093	13.73	0.97	0.01	0.90	3.08
0.30	5.339	0.254	21.06	1.39	0.42	1.20	7.19
0.45	11.84	0.447	26.51	1.74	0.89	1.38	11.37
0.60	20.35	0.661	30.81	2.05	1.31	1.47	15.35
0.75	30.38	0.888	34.20	2.36	1.47	1.50	18.93
0.90	40.67	1.110	36.64	2.66	1.50	1.47	21.77
1.05	50.62	1.324	38.24	2.98	1.50	1.37	23.79
1.20	58.99	1.516	38.91	3.32	1.50	1.20	24.74
1.35	64.31	1.676	38.37	3.75	1.50	0.90	24.24
1.50	60.32	1.767	34.14	4.71	1.50	0.00	19.62

Depth	Q	Area	Veloc	Wp	Yc	TopWidth	Energy
(ft)	(cfs)	(sqft)	(ft/s)	(ft)	(ft)	(ft)	(ft)
0.50	4.490	0.500	8.98	2.24	0.01	2.00	1.75
1.00	28.52	2.000	14.26	4.47	0.80	4.00	4.16
1.50	84.09	4.500	18.69	6.71	1.67	6.00	6.93
2.00	181.1	8.000	22.64	8.94	2.56	8.00	9.97
2.50	328.4	12.50	26.27	11.18	3.48	10.00	13.23
3.00	534.1	18.00	29.67	13.42	4.42	12.00	16.69
3.50	805.7	24.50	32.88	15.65	5.00	14.00	20.31
4.00	1,150	32.00	35.95	17.89	5.00	16.00	24.09
4.50	1,575	40.50	38.89	20.12	5.00	18.00	28.01
5.00	2,086	50.00	41.72	22.36	5.00	20.00	32.06

Depth	Q	Area	Veloc	Wp	Yc	TopWidth	Energy
(ft)	(cfs)	(sqft)	(ft/s)	(ft)	(ft)	(ft)	(ft)
0.20	1.845	0.165	11.21	1.29	0.01	1.20	2.15
0.40	7.753	0.451	17.20	1.86	0.47	1.60	5.00
0.60	17.19	0.794	21.65	2.32	0.99	1.83	7.89
0.80	29.55	1.175	25.16	2.74	1.50	1.96	10.64
1.00	44.11	1.579	27.93	3.15	1.86	2.00	13.13
1.20	59.06	1.974	29.93	3.55	1.97	1.96	15.12
1.40	73.51	2.353	31.24	3.97	1.99	1.83	16.57
1.60	85.66	2.695	31.78	4.43	2.00	1.60	17.30
1.80	93.39	2.979	31.34	5.00	2.00	1.20	17.07
2.00	87.60	3.142	27.88	6.28	2.00	0.00	14.09

Depth	Q	Area	Veloc	Wp	Yc	TopWidth	Energy
(ft)	(cfs)	(sqft)	(ft/s)	(ft)	(ft)	(ft)	(ft)
0.50	2.068	0.500	4.14	2.24	0.01	2.00	0.77
1.00	13.13	2.000	6.57	4.47	0.59	4.00	1.67
1.50	38.73	4.500	8.61	6.71	1.22	6.00	2.65
2.00	83.42	8.000	10.43	8.94	1.88	8.00	3.69
2.50	151.3	12.50	12.10	11.18	2.56	10.00	4.78
3.00	246.0	18.00	13.67	13.42	3.24	12.00	5.90
3.50	371.1	24.50	15.15	15.65	3.94	14.00	7.07
4.00	529.8	32.00	16.56	17.89	4.64	16.00	8.26
4.50	725.3	40.50	17.91	20.12	5.00	18.00	9.49
5.00	960.7	50.00	19.21	22.36	5.00	20.00	10.74

Depth	Q	Area	Veloc	Wp	Yc	TopWidth	Energy
(ft)	(cfs)	(sqft)	(ft/s)	(ft)	(ft)	(ft)	(ft)
0.20	0.953	0.165	5.79	1.29	0.01	1.20	0.72
0.40	4.004	0.451	8.88	1.86	0.34	1.60	1.63
0.60	8.876	0.794	11.18	2.32	0.70	1.83	2.54
0.80	15.26	1.175	12.99	2.74	1.06	1.96	3.42
1.00	22.78	1.579	14.42	3.15	1.41	2.00	4.23
1.20	30.50	1.974	15.45	3.55	1.70	1.96	4.91
1.40	37.96	2.353	16.13	3.97	1.87	1.83	5.45
1.60	44.23	2.695	16.41	4.43	1.95	1.60	5.79
1.80	48.23	2.979	16.19	5.00	1.97	1.20	5.87
2.00	45.23	3.142	14.40	6.28	1.98	0.00	5.22

Depth	Q	Area	Veloc	Wp	Yc	TopWidth	Energy
(ft)	(cfs)	(sqft)	(ft/s)	(ft)	(ft)	(ft)	(ft)
0.20	0.953	0.165	5.79	1.29	0.01	1.20	0.72
0.40	4.004	0.451	8.88	1.86	0.34	1.60	1.63
0.60	8.876	0.794	11.18	2.32	0.70	1.83	2.54
0.80	15.26	1.175	12.99	2.74	1.06	1.96	3.42
1.00	22.78	1.579	14.42	3.15	1.41	2.00	4.23
1.20	30.50	1.974	15.45	3.55	1.70	1.96	4.91
1.40	37.96	2.353	16.13	3.97	1.87	1.83	5.45
1.60	44.23	2.695	16.41	4.43	1.95	1.60	5.79
1.80	48.23	2.979	16.19	5.00	1.97	1.20	5.87
2.00	45.23	3.142	14.40	6.28	1.98	0.00	5.22

Depth	Q	Area	Veloc	Wp	Yc	TopWidth	Energy
(ft)	(cfs)	(sqft)	(ft/s)	(ft)	(ft)	(ft)	(ft)
0.20	1.261	0.165	7.66	1.29	0.01	1.20	1.11
0.40	5.297	0.451	11.75	1.86	0.39	1.60	2.55
0.60	11.74	0.794	14.79	2.32	0.82	1.83	4.00
0.80	20.19	1.175	17.19	2.74	1.23	1.96	5.39
1.00	30.13	1.579	19.08	3.15	1.62	2.00	6.66
1.20	40.35	1.974	20.44	3.55	1.87	1.96	7.70
1.40	50.22	2.353	21.34	3.97	1.96	1.83	8.48
1.60	58.52	2.695	21.71	4.43	1.98	1.60	8.93
1.80	63.80	2.979	21.41	5.00	1.99	1.20	8.93
2.00	59.84	3.142	19.05	6.28	2.00	0.00	7.64

Depth	Q	Area	Veloc	Wp	Yc	TopWidth	Energy
(ft)	(cfs)	(sqft)	(ft/s)	(ft)	(ft)	(ft)	(ft)
0.20	2.285	0.165	13.88	1.29	0.01	1.20	3.20
0.40	9.601	0.451	21.30	1.86	0.53	1.60	7.45
0.60	21.28	0.794	26.81	2.32	1.11	1.83	11.77
0.80	36.60	1.175	31.16	2.74	1.66	1.96	15.89
1.00	54.62	1.579	34.59	3.15	1.94	2.00	19.60
1.20	73.13	1.974	37.06	3.55	1.99	1.96	22.55
1.40	91.03	2.353	38.68	3.97	2.00	1.83	24.66
1.60	106.1	2.695	39.35	4.43	2.00	1.60	25.68
1.80	115.6	2.979	38.81	5.00	2.00	1.20	25.22
2.00	108.5	3.142	34.53	6.28	2.00	0.00	20.53

Depth	Q	Area	Veloc	Wp	Yc	TopWidth	Energy
(ft)	(cfs)	(sqft)	(ft/s)	(ft)	(ft)	(ft)	(ft)
0.50	3.127	0.500	6.25	2.24	0.01	2.00	1.11
1.00	19.86	2.000	9.93	4.47	0.69	4.00	2.53
1.50	58.56	4.500	13.01	6.71	1.44	6.00	4.13
2.00	126.1	8.000	15.76	8.94	2.22	8.00	5.86
2.50	228.7	12.50	18.29	11.18	3.02	10.00	7.70
3.00	371.9	18.00	20.66	13.42	3.82	12.00	9.64
3.50	561.0	24.50	22.90	15.65	4.64	14.00	11.65
4.00	801.0	32.00	25.03	17.89	5.00	16.00	13.74
4.50	1,097	40.50	27.08	20.12	5.00	18.00	15.90
5.00	1,452	50.00	29.05	22.36	5.00	20.00	18.12

Depth	Q	Area	Veloc	Wp	Yc	TopWidth	Energy
(ft)	(cfs)	(sqft)	(ft/s)	(ft)	(ft)	(ft)	(ft)
0.20	0.825	0.165	5.01	1.29	0.01	1.20	0.59
0.40	3.467	0.451	7.69	1.86	0.32	1.60	1.32
0.60	7.687	0.794	9.68	2.32	0.65	1.83	2.06
0.80	13.22	1.175	11.25	2.74	0.99	1.96	2.77
1.00	19.73	1.579	12.49	3.15	1.31	2.00	3.43
1.20	26.41	1.974	13.38	3.55	1.60	1.96	3.98
1.40	32.88	2.353	13.97	3.97	1.80	1.83	4.43
1.60	38.31	2.695	14.21	4.43	1.90	1.60	4.74
1.80	41.76	2.979	14.02	5.00	1.95	1.20	4.85
2.00	39.17	3.142	12.47	6.28	1.96	0.00	4.42

Depth	Q	Area	Veloc	Wp	Yc	TopWidth	Energy
(ft)	(cfs)	(sqft)	(ft/s)	(ft)	(ft)	(ft)	(ft)
0.20	2.566	0.165	15.59	1.29	0.01	1.20	3.98
0.40	10.78	0.451	23.92	1.86	0.56	1.60	9.29
0.60	23.90	0.794	30.10	2.32	1.18	1.83	14.69
0.80	41.09	1.175	34.99	2.74	1.74	1.96	19.83
1.00	61.33	1.579	38.84	3.15	1.96	2.00	24.45
1.20	82.12	1.974	41.61	3.55	2.00	1.96	28.12
1.40	102.2	2.353	43.43	3.97	2.00	1.83	30.73
1.60	119.1	2.695	44.19	4.43	2.00	1.60	31.96
1.80	129.9	2.979	43.58	5.00	2.00	1.20	31.33
2.00	121.8	3.142	38.77	6.28	2.00	0.00	25.37

Depth	Q	Area	Veloc	Wp	Yc	TopWidth	Energy
(ft)	(cfs)	(sqft)	(ft/s)	(ft)	(ft)	(ft)	(ft)
0.50	1.915	0.500	3.83	2.24	0.01	2.00	0.73
1.00	12.16	2.000	6.08	4.47	0.57	4.00	1.57
1.50	35.86	4.500	7.97	6.71	1.19	6.00	2.49
2.00	77.23	8.000	9.65	8.94	1.83	8.00	3.45
2.50	140.0	12.50	11.20	11.18	2.48	10.00	4.45
3.00	227.7	18.00	12.65	13.42	3.14	12.00	5.49
3.50	343.5	24.50	14.02	15.65	3.82	14.00	6.56
4.00	490.5	32.00	15.33	17.89	4.50	16.00	7.65
4.50	671.5	40.50	16.58	20.12	5.00	18.00	8.77
5.00	889.4	50.00	17.79	22.36	5.00	20.00	9.92

Depth	Q	Area	Veloc	Wp	Yc	TopWidth	Energy
(ft)	(cfs)	(sqft)	(ft/s)	(ft)	(ft)	(ft)	(ft)
0.20	2.695	0.165	16.38	1.29	0.01	1.20	4.37
0.40	11.32	0.451	25.12	1.86	0.57	1.60	10.21
0.60	25.11	0.794	31.62	2.32	1.21	1.83	16.15
0.80	43.17	1.175	36.75	2.74	1.77	1.96	21.80
1.00	64.43	1.579	40.80	3.15	1.97	2.00	26.88
1.20	86.27	1.974	43.71	3.55	2.00	1.96	30.90
1.40	107.4	2.353	45.62	3.97	2.00	1.83	33.76
1.60	125.1	2.695	46.42	4.43	2.00	1.60	35.10
1.80	136.4	2.979	45.78	5.00	2.00	1.20	34.39
2.00	127.9	3.142	40.73	6.28	2.00	0.00	27.79

HYDROLOGY CALCULATIONS

EXISTING CONDITIONS

BASIN NUMBER	AREA (acres)	C Value	C*A	Tc (min)	I_{50}[a] (in/hr)	Q_{50} (CFS)	I_{100}[a] (in/hr)	Q_{100} (CFS)
A1	45.40	0.53	24.06	11.9	3.00	72.19	3.20	77.00
B1	5.43	0.85	4.61	5.0	4.20	19.37	4.40	20.30
C1	32.85	0.65	21.24	9.1	3.30	70.09	3.60	76.46
D1	4.45	0.50	2.23	8.9	3.30	7.35	3.60	8.01
E1	3.77	0.50	1.88	7.3	3.60	6.78	4.00	7.53
SUB-TOTAL TECOLOTE CANYON	***91.89***	***0.59***	***54.02***			***175.78***		***189.30***

DEVELOPED CONDITIONS

BASIN NUMBER	AREA (acres)	C Value	C*A	Tc (min)	I_{50}[a] (in/hr)	Q_{50} (CFS)	I_{100}[a] (in/hr)	Q_{100} (CFS)
L1	45.50	0.54	24.78	10.8	3.10	76.81	3.30	81.76
M1	5.44	0.85	4.63	5.0	4.20	19.43	4.40	20.36
N1	33.01	0.70	23.25	8.2	3.40	79.03	3.80	88.33
O1	4.45	0.50	2.23	8.9	3.30	7.35	3.60	8.01
P1	3.77	0.50	1.88	7.3	3.60	6.78	4.00	7.53
SUB-TOTAL TECOLOTE CANYON	***92.17***	***0.62***	***56.76***			***189.40***		***205.99***

EXISTING CONDITIONS

BASIN NUMBER	AREA (acres)	C Value	C*A	Tc (min)	I_{50}[a] (in/hr)	Q_{50} (CFS)	I_{100}[a] (in/hr)	Q_{100} (CFS)
F1	36.25	0.58	21.14	13.9	2.90	61.31	3.10	65.53
SUB-TOTAL MORENA BLVD	***36.25***	***0.58***	***21.14***			***61.31***		***65.53***

DEVELOPED CONDITIONS

BASIN NUMBER	AREA (acres)	C Value	C*A	Tc (min)	I_{50}[a] (in/hr)	Q_{50} (CFS)	I_{100}[a] (in/hr)	Q_{100} (CFS)
Q1	36.25	0.63	22.73	13.4	2.90	65.92	3.10	70.47
SUB-TOTAL MORENA BLVD	***36.25***	***0.63***	***22.73***			***65.92***		***70.47***

EXISTING CONDITIONS

BASIN NUMBER	AREA (acres)	C Value	C*A	Tc (min)	I_{50}[a] (in/hr)	Q_{50} (CFS)	I_{100}[a] (in/hr)	Q_{100} (CFS)
G1	5.90	0.85	5.02	5.0	4.20	21.08	4.40	22.08
H1	9.99	0.50	4.99	10.8	3.10	15.48	3.30	16.48
I1	8.86	0.50	4.43	8.3	3.40	15.07	3.80	16.84
J1	24.02	0.57	13.77	7.6	3.50	48.21	3.90	53.72
K1	9.25	0.78	7.24	8.7	3.30	23.90	3.60	26.07
SUB-TOTAL SAN DIEGO RIVER	***58.02***	***0.61***	***35.46***			***123.74***		***135.19***

DEVELOPED CONDITIONS

BASIN NUMBER	AREA (acres)	C Value	C*A	Tc (min)	I_{50}[a] (in/hr)	Q_{50} (CFS)	I_{100}[a] (in/hr)	Q_{100} (CFS)
R1	5.90	0.85	5.02	5.0	4.20	21.08	4.40	22.08
S1	9.99	0.50	4.99	10.8	3.10	15.48	3.30	16.48
T1	8.86	0.50	4.43	8.3	3.40	15.07	3.80	16.84
U1	24.02	0.68	16.30	7.3	3.60	58.66	4.00	65.18
V1	8.97	0.85	7.63	6.4	3.80	28.98	4.10	31.26
SUB-TOTAL SAN DIEGO RIVER	***57.75***	***0.66***	***38.37***			***139.27***		***151.84***

[a]Intensity of rainfall was obtained from the "Rainfall Intensity-Duration-Frequency Curves for County of San Diego" found in the Cit of San Diego Drainage manual.

APPENDIX B: REFERENCE MATERIAL

SECTION 6
RATIONAL METHOD HYDROGRAPH PROCEDURE

6.1 INTRODUCTION

The procedures in this section are for the development of hydrographs from RM study results for study areas up to approximately 1 square mile in size. The RM, discussed in Section 3, is a mathematical formula used to determine the maximum runoff rate from a given rainfall. It has particular application in urban storm drainage, where it is used to estimate peak runoff rates from small urban and rural watersheds for the design of storm drains and small drainage structures. However, in some instances such as for design of detention basins, the peak runoff rate is insufficient information for the design, and a hydrograph is needed. Unlike the NRCS hydrologic method (discussed in Section 4), the RM itself does not create hydrographs. The procedures for detention basin design based on RM study results were first developed as part of the East Otay Mesa Drainage Study. Rick Engineering Company performed this study under the direction of County Flood Control. The procedures in this section may be used for the development of hydrographs from RM study results for study areas up to approximately 1 square mile in size.

6.2 HYDROGRAPH DEVELOPMENT

The concept of this hydrograph procedure is based on the RM formula:

$$Q = C\ I\ A$$

Where:
- Q = peak discharge, in cubic feet per second (cfs)
- C = runoff coefficient, proportion of the rainfall that runs off the surface (no units)
- I = average rainfall intensity for a duration equal to the T_c for the area, in inches per hour
- A = drainage area contributing to the design location, in acres

The RM formula is discussed in more detail in Section 3.

An assumption of the RM is that discharge increases linearly over the T_c for the drainage area until reaching the peak discharge as defined by the RM formula, and then decreases linearly. A linear hydrograph can be developed for the peak flow occurring over the T_c as shown in Figure 6-1. However, for designs that are dependent on the total storm volume, it is not sufficient to consider a single hydrograph for peak flow occurring over the T_c at the beginning of a 6-hour storm event because the hydrograph does not account for the entire volume of runoff from the storm event. The volume under the hydrograph shown in Figure 6-1 is equal to the rainfall intensity multiplied by the duration for which that intensity occurs (T_c), the drainage area (A) contributing to the design location, and the runoff coefficient (C) for the drainage area. For designs that are dependent on the total storm volume, a hydrograph must be generated to account for the entire volume of runoff from the 6-hour storm event. The hydrograph for the entire 6-hour storm event is generated by creating a rainfall distribution consisting of blocks of rain, creating an incremental hydrograph for each block of rain, and adding the hydrographs from each block of rain. This process creates a hydrograph that contains runoff from all the blocks of rain and accounts for the entire volume of runoff from the 6-hour storm event. The total volume under the resulting hydrograph is equal to the following equation:

$$VOL = CP_6A \qquad \text{(Eq. 6-1)}$$

Where: VOL = volume of runoff (acre-inches)

P_6 = 6-hour rainfall (inches)

C = runoff coefficient

A = area of the watershed (acres)

County of San Diego Hydrology Manual

Rainfall Isopluvials

50 Year Rainfall Event - 6 Hours

Isopluvial (inches)

Orange County

Riverside County

Imperial County

Mexico

Pacific Ocean

OCEANSIDE
VISTA
CARLSBAD
ESCONDIDO
ENCINITAS
SOLANA BEACH
DEL MAR
POWAY
S.D. COUNTY
SANTEE
SAN DIEGO
EL CAJON
LA MESA
LEMON GROVE
CORONADO
CAULA VISTA
IMPERIAL BEACH
SD

117°30' 117°15' 117°00' 116°45' 116°30' 116°15'
33°30' 33°15' 33°00' 32°45' 32°30'

DPW GIS
Department of Public Works
Geographic Information Services

SanGIS
We Have San Diego Covered!

N W E S

3 0 3 Miles

County of San Diego Hydrology Manual

Rainfall Isopluvials

100 Year Rainfall Event - 6 Hours

Isopluvial (inches)

Orange County

Riverside County

Imperial County

Pacific Ocean

Mexico

OCEANSIDE
VISTA
CARLSBAD
ESCONDIDO
ENCINITAS
SOLANA BEACH
DEL MAR
POWAY
SAN DIEGO
SANTEE
EL CAJON
LA MESA
LEMON GROVE
CORONADO
CHULA VISTA
IMPERIAL BEACH
S.D. COUNTY
SD

117°30' 117°15' 117°00' 116°45' 116°30' 116°15'
33°30' 33°15' 33°00' 32°45' 32°30'

DPW GIS
Department of Public Works
Geographic Information Services

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N W E S

3 0 3 Miles

GENERAL LEGEND

USD BOUNDARY
CUP BOUNDARY
EDGE OF CONC.
EDGE OF ASPH.
EDGE OF DIRT
AWNING
EXISTING BUILDING
SIDEWALK
CURB AND GUTTER
TREES
SINGLE TREE
PALM
INDEX CONTOUR 1350
INTER CONTOUR 1340
POOL

HYDROLOGY LEGEND

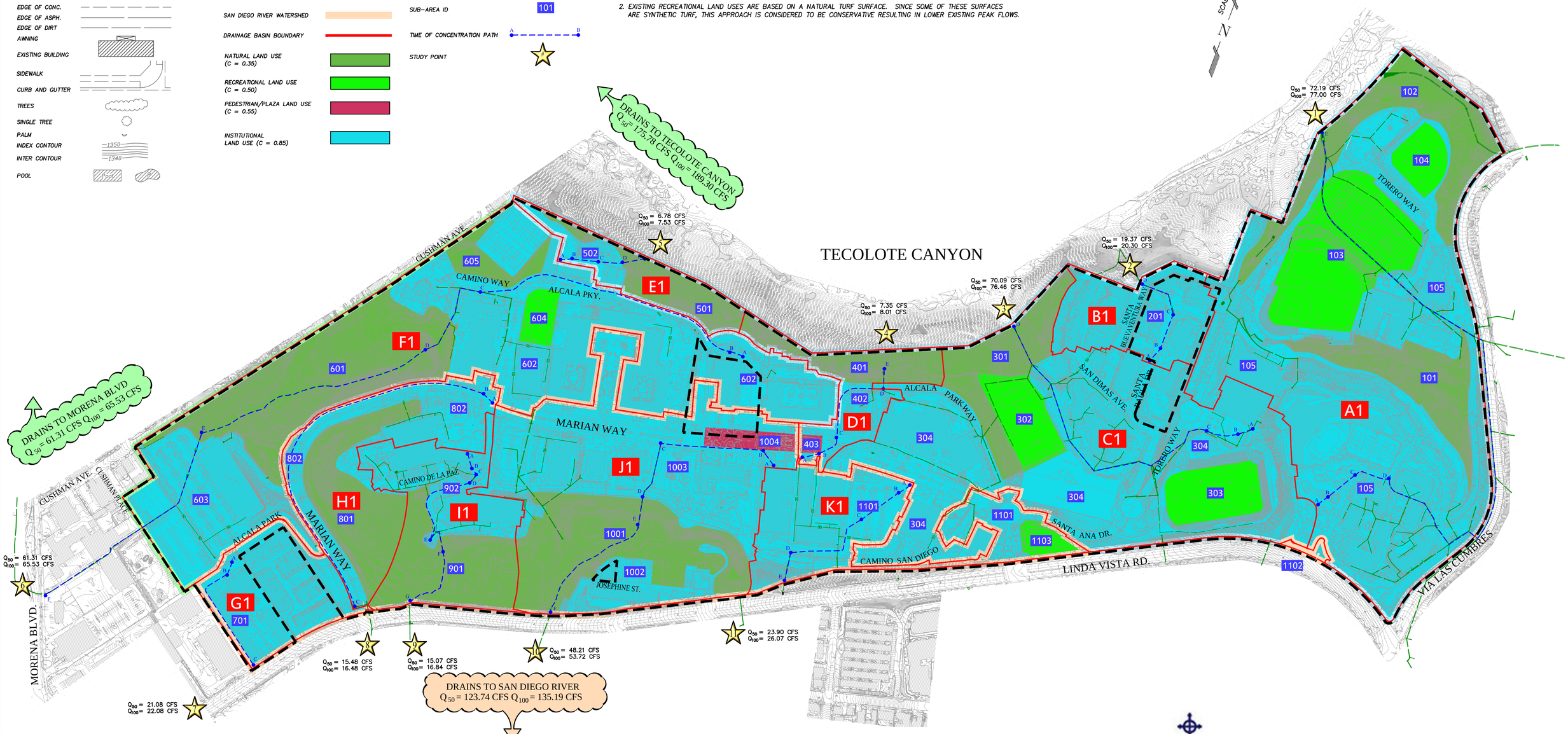
TECOLOTE CANYONE WATERSHED
MORENA BLVD. WASTERSHED
SAN DIEGO RIVER WATERSHED
DRAINAGE BASIN BOUNDARY
NATURAL LAND USE (C = 0.35)
RECREATIONAL LAND USE (C = 0.50)
PEDESTRIAN/PLAZA LAND USE (C = 0.55)
INSTITUTIONAL LAND USE (C = 0.85)

DRAINAGE BASIN ID — A1
SUB-AREA ID — 101
TIME OF CONCENTRATION PATH — A B
STUDY POINT — 1

NOTES

1. STUDY POINT AND WATERSHED PEAK FLOWS ARE BASED ON RUNOFF GENERATED WITHIN THE USD BOUNDARY ONLY. OFFSITE AREAS CONTRIBUTING FLOW TO THESE POINTS HAVE BEEN OMITTED TO PROVIDE AN ANALYSIS FOCUSED ON THE PROPOSED CAMPUS MASTER PLAN.
2. EXISTING RECREATIONAL LAND USES ARE BASED ON A NATURAL TURF SURFACE. SINCE SOME OF THESE SURFACES ARE SYNTHETIC TURF, THIS APPROACH IS CONSIDERED TO BE CONSERVATIVE RESULTING IN LOWER EXISTING PEAK FLOWS.

SCALE: 1"=200'
N



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DRAWING SCALE

200 0 200 400
SCALE IN FEET
GRAPHIC SCALE

~ USD MASTER PLAN 2015 ~

EXISTING CONDITION HYDROLOGY MAP

C:\USERS\KAE\DOCUMENTS\KAE\PROJECTS\038 USD MASTER PLAN\REPORTS\VS\0059 USD EXISTING HYDROLOGY MAP.DWG (02-13-16 8:52:28PM) Plotted by: KAE

GENERAL LEGEND

- USD BOUNDARY
- CUP BOUNDARY
- EDGE OF CONC.
- EDGE OF ASPH.
- EDGE OF DIRT
- AWNING
- EXISTING BUILDING
- SIDEWALK
- CURB AND GUTTER
- TREES
- SINGLE TREE
- PALM
- INDEX CONTOUR (1350)
- INTER CONTOUR (1340)
- POOL
- PROPOSED BUILDING

HYDROLOGY LEGEND

- TECOLOTE CANYONE WATERSHED
- MORENA BLVD. WATERSHED
- SAN DIEGO RIVER WATERSHED
- DRAINAGE BASIN BOUNDARY
- NATURAL LAND USE (C = 0.35)
- RECREATIONAL LAND USE (C = 0.50)
- PEDESTRIAN/PLAZA LAND USE (C = 0.55)
- INSTITUTIONAL LAND USE (C = 0.85)
- DRAINAGE BASIN ID — A1
- SUB-AREA ID — 101
- TIME OF CONCENTRATION PATH — A to B
- STUDY POINT — 1
- BASIN NET INCREASE — cfs / Ac-in — 100-YR FLOW / 100-YR VOLUME

NOTES

1. STUDY POINT AND WATERSHED PEAK FLOWS ARE BASED ON RUNOFF GENERATED WITHIN THE USD BOUNDARY ONLY. OFFSITE AREAS CONTRIBUTING FLOW TO THESE POINTS HAVE BEEN OMITTED TO PROVIDE AN ANALYSIS FOCUSED ON THE PROPOSED CAMPUS MASTER PLAN.
2. EXISTING RECREATIONAL LAND USES ARE BASED ON A NATURAL TURF SURFACE. SINCE SOME OF THESE SURFACES ARE SYNTHETIC TURF, THIS APPROACH IS CONSIDERED TO BE CONSERVATIVE RESULTING IN LOWER EXISTING PEAK FLOWS.
3. PROPOSED RECREATIONAL LAND USES ARE ASSUMED TO BE FULLY IMPERVIOUS. THIS APPROACH IS CONSIDERED TO BE CONSERVATIVE RESULTING IN HIGHER DEVELOPED PEAK FLOWS.
4. DEVELOPED CONDITION PEAK FLOWS REPORTED ARE UNMITIGATED. IT IS ANTICIPATED THAT EACH PROJECT WILL PROVIDE DETENTION TO EFFECTIVELY MITIGATE ANY INCREASE IN PEAK FLOWS. REFER TO TABLE 3.1 OF THE DRAINAGE STUDY.

SCALE: 1"=200'

TECOLOTE CANYON

DRAINS TO TECOLOTE CANYON
Q_{50}= 189.40 CFS Q_{100}= 205.99 CFS
(+13.62 CFS) (+16.69 CFS)

DRAINS TO MORENA BLVD
Q_{50}= 65.92 CFS Q_{100} = 70.47 CFS
(+4.62 CFS) (+4.94 CFS)

DRAINS TO SAN DIEGO RIVER
Q_{50} = 139.27 CFS Q_{100} = 151.84 CFS
(+15.53 CFS) (+16.65 CFS)

	Q50	Q100
1	6.78 CFS	7.53 CFS
2	19.43 CFS	20.36 CFS
3	79.03 CFS	88.33 CFS
4	7.35 CFS	8.01 CFS
5	76.81 CFS	81.76 CFS
6	65.92 CFS	70.47 CFS
7	21.08 CFS	22.08 CFS
8	15.48 CFS	16.48 CFS
9	15.07 CFS	16.84 CFS
10	58.66 CFS	65.18 CFS
11	28.98 CFS	31.26 CFS

	Ac-in	cfs
1	0.00	0.00
2	0.06	0.03
3	11.87	4.61
4	0.00	0.00
5	4.76	1.64
6	4.94	3.66
7	0.00	0.00
8	0.00	0.00
9	0.00	0.00
10	11.46	5.80
11	5.19	0.88

DRAWING SCALE
200 0 200 400
SCALE IN FEET
GRAPHIC SCALE

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~ USD MASTER PLAN 2015 ~

DEVELOPED CONDITION HYDROLOGY MAP

KETTLER LEWECK
ENGINEERING

PRELIMINARY

STORM WATER QUALITY

MANAGEMENT PLAN FOR:

UNIVERSITY OF SAN DIEGO
2015 MASTER PLAN

Facilities Management

5998 Alcala Park

KLE PROJECT NO.: 0059

PRELIMINARY STORM WATER QUALITY MANAGEMENT PLAN (SWQMP)

UNIVERSITY OF SAN DIEGO
2015 MASTER PLAN
&
CONDITIONAL USE PERMIT
PTS 417090
SAN DIEGO, CALIFORNIA

Original Date: June 30, 2015
Revision Date: October 30, 2015
Revision Date: March 7, 2016
Revision Date: June 17, 2016
Final Date: August 22, 2016

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EXHIBITS

Map Pocket	Illustrative Site Plan
Map Pocket	Site Map

APPENDIX

Appendix A	Storm Water Requirements Applicability Checklist
Appendix B	2010 Clean Water Act Section 303(d) List
Appendix C	NRCS Web Survey Soil Report
Appendix D	Pollutant Control & HMP Calculations (Based on January 2016 Requirements)

REFERENCES

Vicinity Map, Basin Planning Areas (1994)
San Diego Region Hydrologic Units, Areas and Subareas (1994)

1.0 INTRODUCTION

The purpose of this Preliminary Storm Water Quality Management Plan (SWQMP) is to document the technical description of water quality measures associated with the University of San Diego's Main Campus 2015 Master Plan Project in support of a Conditional Use Permit (CUP) application. Specifically, this report will identify potential water quality impacts, describe the Best Management Practices (BMPs) that will be incorporated to mitigate the impacts, and describe the implementation and maintenance of water quality pollutant control BMPs that will be installed as part of the project. A SWQMP is required to satisfy the following requirements:

- ✓ City of San Diego Storm Water Standards Manual (January 2016)*,
- ✓ California Regional Water Quality Control Board's Municipal Permit (San Diego Region), and
- ✓ State Water Resources Control Board NPDES General Permit.

*This preliminary SWQMP selects and sizes BMPs in consideration of the City of San Diego January 2016 Storm Water Standards Manual. It should be noted that the manual became effective February 16, 2016 and may be subject to future updates. As a result, BMPs sizing may require adjustments to address the guidelines in place at the time of Substantial Conformance Review (SCR) application and/or ministerial permitting application.

Refer to the Preliminary Drainage Report for a detailed evaluation of the hydrologic conditions of the existing campus as a result of the proposed development as described herein.

2.0 PROJECT INFORMATION

2.1 Project Location

The University of San Diego (USD) campus occupies approximately 180 acres of land devoted to university-related uses in the central portion of the City of San Diego (City), in the community of Linda Vista. The campus is located 4 miles north of downtown San Diego, approximately 0.5 mile east of Interstate 5 (I-5) and 0.5 mile north of Interstate 8 (I-8). The USD campus is located within an unsectioned area of Township 16 South, Range 3 West, on the U.S. Geological Survey (USGS) 7.5-minute La Jolla quadrangle map. Tecolote Canyon Natural Park forms the northern border of the property; Morena Boulevard is located to the west, with Via Las Cumbres bordering the campus on the east, and Linda Vista Road to the south. Elevations on campus range from approximately 50 feet above mean sea level (AMSL) to approximately 260 feet AMSL With the exception of the steep, north-facing slopes along the northern campus border and the slopes on the western end of campus near Marian Way, the majority of the campus is developed and supports university facilities (buildings, parking lots, athletic fields, etc.) and associated landscaping.

Surrounding land uses include commercial/industrial development and residential housing in the Morena Boulevard area to the west of the campus, student and non-student multi-family housing immediately to the south and various types of residential development to the east. Tecolote Canyon Natural Park contains undeveloped regional open space to the north. The City's Multi-habitat Planning Area (MHPA) occurs on approximately 7.6 acres along the northern edge of the campus and extends offsite into Tecolote Canyon. The campus is located within the Airport Influence Area (AIA) for San Diego International Airport and Montgomery Field.

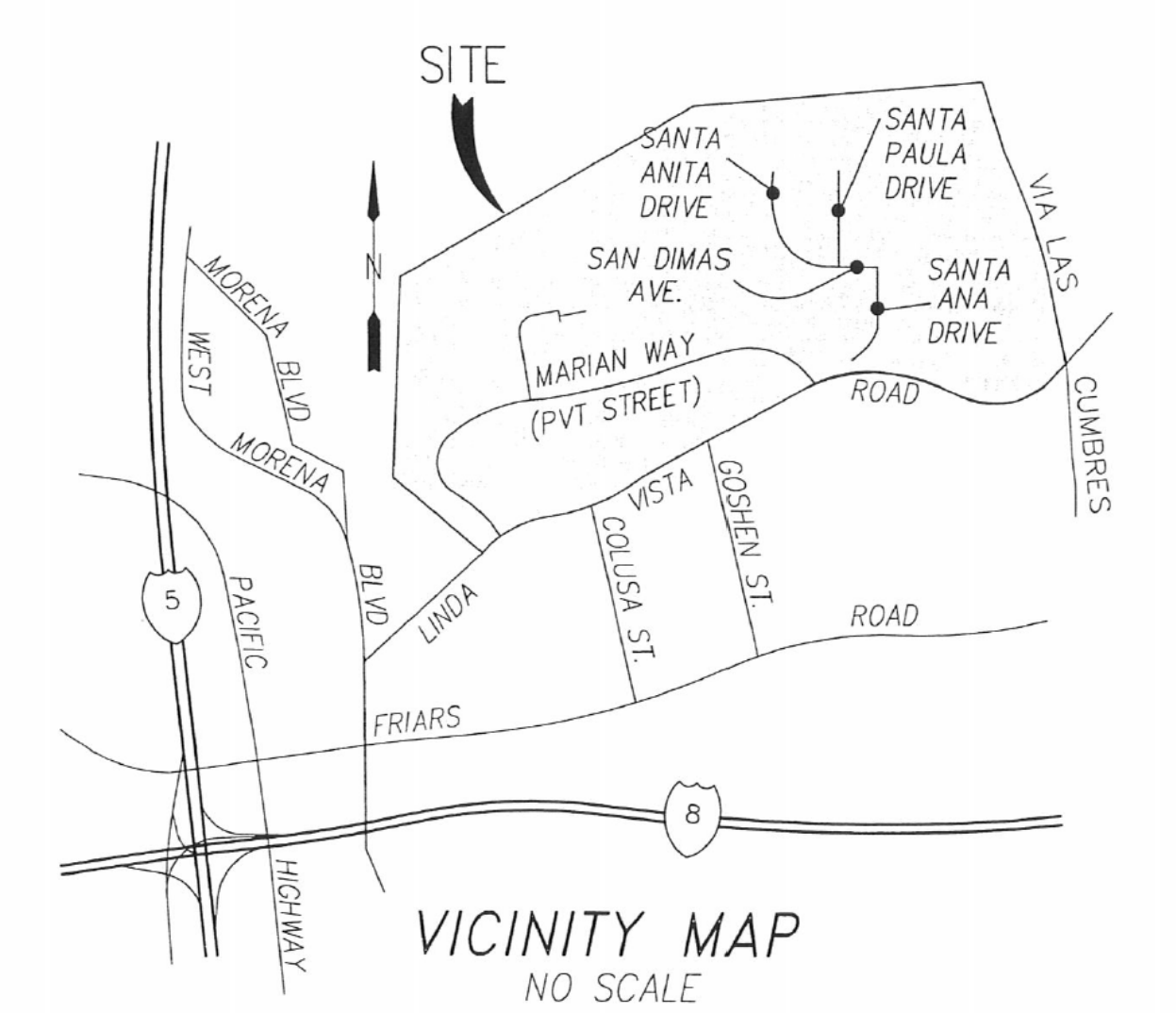


FIGURE 1 – VICINITY MAP

2.2 Project Description

In 1996, USD received approval of its existing Master Plan to guide the phased buildout of the campus through the year 2030. The City issued Conditional Use Permit (CUP)/ Resource Protection Ordinance (RPO) Permit No. 92-0568 to allow the campus to construct 23 conceptual projects and expand student population to 7,000 FTE. Two future study areas were also identified in the Master Plan. The sequence of the projects was not determined at that time in order to provide flexibility with regard to economics and academic needs. The 1996 Master Plan EIR was prepared to assess the short- and long-term, as well as cumulative, impacts of implementing the Master Plan and was certified in conjunction with the CUP approvals.

The Master Plan is a document that records the vision and goals of the physical campus. This vision for the campus is updated from time to time to reflect the changes in demographics and the economy that affect higher education. Most importantly, the Master Plan is required by the City as the basis for the university's CUP and to ensure the University's fulfillment of current regulations. Over the last several years, USD campus officials have been conducting vision planning and space planning exercises to address the future needs of the university. An update to the existing Master Plan is now proposed.

The proposed USD Master Plan Update provides a comprehensive revision of the 1996 Master Plan and Design Guidelines, as well as the campus' building space and infrastructure needs associated with increasing enrollment from 7,000 full-time equivalent (FTE) students to 10,000 FTE over the next 20+ years. The USD Master Plan Update project would to allow for the development of academic core/student service/ support uses and athletics and recreation uses, and additional student housing. Parking supply expansions would also occur under the proposed Master Plan Update.

Among the projects outlined in the Master Plan Update are 14 proposed construction sites, as well as 16 approved projects identified in the 1996 Master Plan EIR that have previous City review/approvals but remain unbuilt. The 14 proposed project sites would allow for the construction of academic/administrative buildings, student housing, student services uses, athletics/athletic support/administrative buildings, parking, pedestrian circulation and landscape improvements not contemplated in the 1996 Master Plan and related EIR. Design guidelines contained in the Master Plan Update would provide a comprehensive design framework to guide campus development. Other elements of the Master Plan Update address the planning context of the campus, provide an enrollment and space analysis, and identify sustainability goals.

The above-described improvements would require the following entitlements: an amended CUP to allow for the continued institutional use, a Site Development Permit (SDP) to allow impacts to Environmentally Sensitive Lands (ESL), and MHPA Boundary Line Correction to shift developed land out of the Multiple Species Conservation Program (MSCP) preserve.

The Master Plan's proposed building projects include:

Site #	Project Description	Note
Previously Approved Projects		
1	Approved as Sports Park; Tennis Center; Proposed Athletics/ Administrative/ Parking	(2)
2	Approved as Environmental Studies Building; New Academic/ Administrative Building	(1)
3	Approved as Library Expansion; New Academic/Administrative Building	(1)
4	Approved as Landscaped Pedestrian Mall; Proposed Plaza	(1)
5	Approved as Olin Hall Expansion with underground parking; Proposed Academic/Administrative Building with Parking	(2)
6	Approved as Hughes Expansion; Proposed Administrative/ Academic Building	(1)
7	Approved as Serra Hall Addition with partial demolition of existing building; Proposed Academic/Administrative Building	(1)
8	Approved as Pedestrian Mall; Proposed Plaza with enhanced connection across buildings and enhanced entry gateway and tram drop-off	(1)
9	Approved as Recreation, Wellness & Aquatic Center	(1)
10	Approved as Public Safety Building; Proposed Administrative/Parking	(1)
11	Approved as Renovation to Missions; Proposed Housing	(2)
12	Approved as Stadium Grandstands and Fieldhouse Facility	(1)
13	Approved as Collegiate Athletic Center and Office Building	(1)
14	Approved as parking and soccer field	(1)
15	Approved Residential Expansion	(1)
16	Approved as softball, golf and club sports building	(1)
Proposed Projects		
17	Proposed Trails/ Landscape Enhancements	(3)
18	Parking/Administrative/Physical Plant. 2 levels above ground.	(3)
19	Plaza/Mall/Bridge	(3)
20	Proposed Academic/Administrative/Support	(3)
21	Proposed Academic/Administrative/Student Support Services	(3)
22	New Academic/Administrative Building (Four Stories to match Shiley Hall)	(3)
23	New Housing/Parking Structure	(3)
24	New Housing/ Student Services/ Parking	(3)
25	Proposed Academic/ Administrative / Parking Building	(3)
26	Engineering Expansion of Loma Hall; Proposed Academic/Administrative Building	(3)
27	Housing/Student Services	(3)
28	Athletics/Administrative Support	(3)
29	Facilities/Athletic Support	(3)
30	New Student Housing/Student Services/ Parking/Athletics	(3)

Notes:

(1) Project previously approved as part of CUP 92-0568 and/or SCR 140192, SCR 104201. Shown for reference only.
(2) Project previously approved as part of CUP 92-0568. To be modified as part of this CUP Application
(3) Project proposed as part of this CUP Application

As of the date of this report, these projects have yet to be permitted for construction. Therefore, it is anticipated that these projects will be required to demonstrate compliance with City and State regulations in affect at the time of the Substantial Conformance Review (SCR) application and then again during the ministerial permitting process (e.g. Grading Permit and/or Building Permit). For the purposed of this preliminary SWQMP, it is assumed that the projects will need to comply with the City's Storm Water Standards Manual dated January 2016.

2.3 Existing Land Use

The existing site is currently comprised of higher education/university uses.

2.4 Drainage Characteristics

Existing Condition:

The Main Campus is sited atop a mesa, with the highest elevation, located at the east side of campus at the intersection of Linda Vista and Via Las Cumbres, is approximately 265-feet. The lowest elevation, at the westerly entrance to the campus from Linda Vista, is approximately 55-feet.

Due to the hilltop nature of the campus, runoff is conveyed in multiple directions and discharged at eleven (11) distinct Study Points. These Study Points are generally divided into three (3) major tributary watersheds; Tecolote Canyon, Morena Boulevard and San Diego River.

The Tecolote Canyon Watershed includes the northern and easterly portions of the campus (approximately 92-acres) that drain towards Mission Bay via Tecolote Canyon. In general, runoff is conveyed south to north and discharges to Tecolote Canyon at Study Points 1 through 5.

The Morena Boulevard Watershed includes the northern and westerly portions of the campus (approximately 40-acres) that drain towards Mission Bay via public storm drain within Morena Boulevard. In general runoff is conveyed east to west and discharges to Morena Boulevard at Study Point 6.

The San Diego River Watershed includes southerly portions of the campus (approximately 60-acres) that drain to the San Diego River and ultimately discharging into the Pacific Ocean. In general runoff is conveyed north to south and discharges at Study Points 7 through 11.

Refer to the Existing Condition Hydrology Map of the separate Preliminary Drainage Report for a graphical depiction of the drainage patterns, discharge points and overall watersheds.

Proposed Condition:

The proposed development will maintain existing drainage patterns, as much as feasible, and runoff from the campus will continue to be split amongst the three watersheds. Although the

developed condition drainage basins may not match the existing conditions exactly, diversions between the major drainage basins will be limited as much as possible and to the satisfaction of the City Engineer. Based on the preliminary Master Plan concept, a small area equal to approximately 0.3% of the 92-acre Tecolote Canyon Watershed is anticipated to be directed north from the ridge line of the San Diego River Watershed. This small diversion, if not eliminated during the SCR phase(s), is due to the hilltop nature of the campus and will be mitigated through the use of Integrated Management Practices that retain runoff to address water quality, hydromodification, and large storm attenuation requirements to the satisfaction of the City Engineer.

Refer to the Developed Condition Hydrology Map of the separate Preliminary Drainage Report for a graphical depiction of the drainage patterns, discharge points and overall watersheds.

2.5 Soil Conditions and Imperviousness

The Main Campus consists of multiple soil types as defined by the Natural Resources Conservation Service (NRCS) Web Soil Survey, including but not limited to;

- HuE – Huerhuero Urban Land Complex (HSG "D")
- CcC – Carlsbad Urban Land Complex (HSG "B")
- OkC – Olivenhain Urban Land Complex (HSG "D")
- TeF – Terrace Escarpments (HSG "D")
- HuC – Huerhuero Urban Land Complex (HSG "D")
- HrE2 – Huerhuero Loam (HSG "D")
- GaF – Gaviota Fine Sandy Loam (HSG "D")

Refer to Appendix "C" for a copy of the Soil Survey Report. The majority of the Main Campus are classified as Hydrologic Soil Group "D". Soil Group "D" soils have a very slow infiltration rate when thoroughly wetted. Under the existing condition, the project area is comprised of both pervious and impervious areas with a composite runoff coefficient of 0.61. Under the proposed condition, the project will be less pervious than the existing condition. The estimated composite runoff coefficient for the proposed condition is 0.63. Refer to the separate Drainage Report for detailed hydrologic calculations of the campus.

2.6 Storm Water Management Requirements

To mitigate the impacts of urban development, local, state, and federal agencies have instituted regulations to demonstrate compliance with the National Pollutant Discharge Elimination System (NPDES) Municipal Separate Storm Sewer System (MS4) Permit. The previous permit was issued by the San Diego Regional Water Quality Control Board (RWQCB) on January 24, 2007 to the City, the County of San Diego, the Port of San Diego, and 18 other regional Co-permittees. When the permit was reissued in 2013, Co-permittees began to develop and implement updated storm water management regulations. To comply with the latest

regulations, development projects are required to incorporate Site Design (also referred to as LID BMPs) and Source Control BMPs as well as potential Pollutant Control and Hydromodification Management Facilities. Each applicable BMP shall be used to reduce storm water pollutants and mitigate increases in flow rates and volumes to the maximum extent practicable.

For the purposes of this report and for the purposes of master planning, it is assumed that most (not all) of the development within the USD Campus will be a Priority Development Project (PDP) and will be subject to Site Design, Source, Treatment and Hydromodification control requirements. Those projects not defined as a PDP per section 1.4.1 of the City of San Diego Storm Water Standards Manual (e.g. projects 17, and 20) are considered Standard Development Projects and will be subject to Site Design and Source Control requirements only.

Note that all projects will be required to submit individual Storm Water Requirements Applicability Checklists (Form DDS-560 dated February 2016) during Substantial Conformance Review (SCR) and ministerial permitting phases. Final classification of each project as a Priority or Standard Development Project will be determined at that time.

3.0 POLLUTANTS AND WATER QUALITY CONDITIONS OF CONCERN

3.1 Existing Watershed

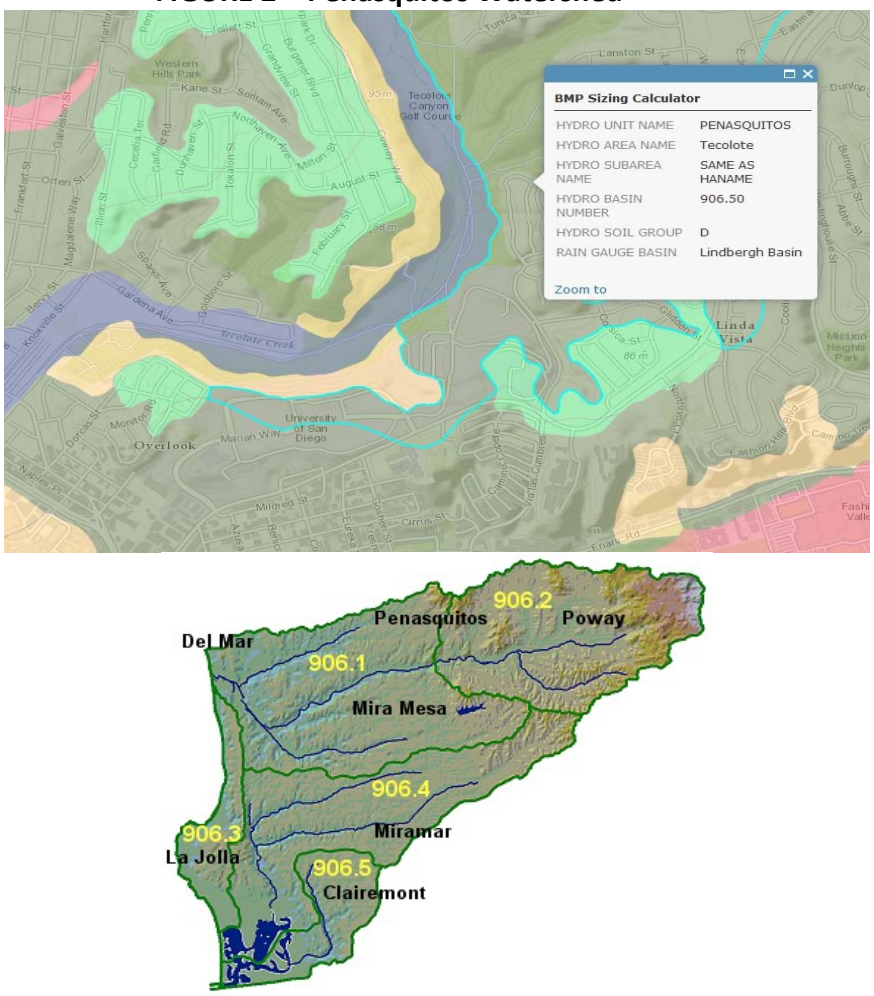
The Main Campus is located within two (2) watersheds as defined by the San Diego Basin Water Quality Control Plan (1994) referred to as the Basin Plan and shown on the Regional Water Quality Control Board's Hydrologic Basin Planning Area Map.

Penasquitos Watershed

The northerly and easterly portion of the Main Campus are within the Los Penasquitos Hydrologic Unit (HU 906.00). The Los Penasquitos Hydrologic Unit is comprised of five hydrologic areas (HAs). These watersheds drain a highly urbanized region located almost entirely west of Interstate 15 in coastal San Diego County. Collectively and individually, they support a variety of water supply, economic, recreational, and habitat-related beneficial uses. The major receiving waters, Los Penasquitos Lagoon and Mission Bay, are both fragile systems that support diverse native fauna and flora. Both water bodies are especially sensitive to the effects of pollutants due to restricted or intermittent tidal flushing.

The northerly and easterly portion of the USD Main Campus is located within the Tecolote Creek HA (906.5) as shown below, which flows southwest to Mission Bay.

FIGURE 2 – Penasquitos Watershed



The Mission Bay watershed drains an area of approximately 80-square miles. Rose Creek and Tecolote Creek are the main tributaries to the Bay, which was converted from a coastal marshland in the 1940s after the completion of a large dredging project. Much of Mission Bay is adversely affected by coliform bacteria inputted by urban runoff and sewage spills, which are discharged by the main tributaries and smaller conveyances draining the watershed. Tecolote Creek is identified as an impaired water body on the California 303(d) list for a host of pollutants including coliform bacteria, trace metals, and toxicity.

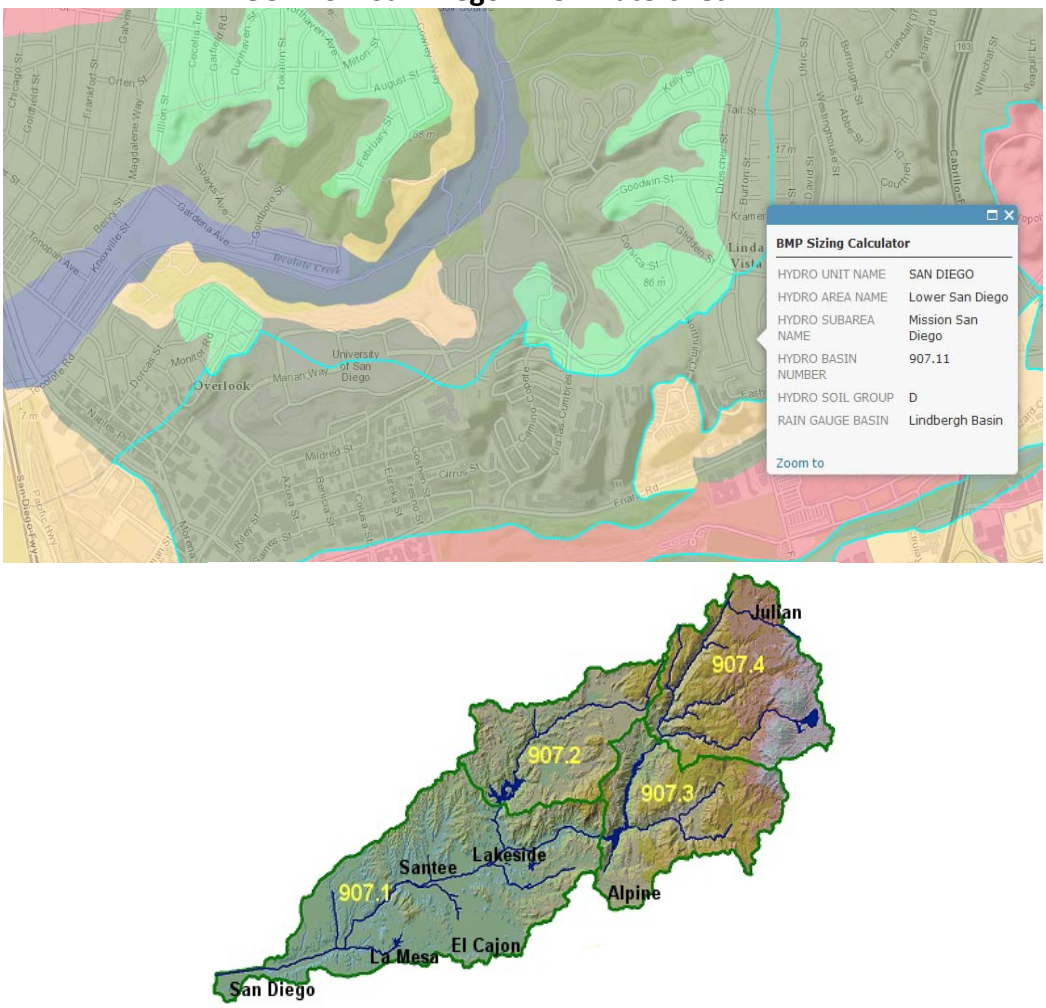
<u>San Diego River Watershed</u>

The southerly and westerly portions of the Main Campus are within the San Diego River Hydrologic Unit (HU 907.00). The San Diego River Hydrologic Unit is comprised of four hydrologic areas (HAs). With a land area of approximately 440-square miles, the San Diego River watershed is the second largest hydrologic unit (HU) in San Diego County. It also has the highest population (~475,000) of the County's watersheds and contains portions of the cities of San Diego, El Cajon, La Mesa, Poway, and Santee and several

unincorporated jurisdictions. Important hydrologic resources in the watershed include five water storage reservoirs, a large groundwater aquifer, extensive riparian habitat, coastal wetlands, and tidepools. Approximately 58.4% of the San Diego River watershed is currently undeveloped. The majority of this undeveloped land is in the upper, eastern portion of the watershed, while the lower reaches are more highly urbanized with residential (14.9%), freeways and roads (5.5%), and commercial/ industrial (4.2%) land uses predominating.

The southerly and westerly portion of the USD Main Campus is located within the Lower San Diego HA (907.1) as shown below, which flows southwest to the San Diego River.

FIGURE 3 – San Diego River Watershed



The mouth of the river discharges into the Pacific Ocean at the community of Ocean Beach. Beach postings and closures from elevated levels of coliform bacteria more than doubled between 1996 and 1999 due to urban runoff and sewage spills. Discharge from the San Diego River outlet may also influence water quality in other nearby coastal areas including Sunset Cliffs, Pacific Beach, and Mission Beach. The extensive groundwater

resources beneath the San Diego River provide a cost effective and reliable water supply to four local water districts and the City of San Diego. Excessive extraction, increasing total dissolved solids, and MTBE contamination now threatens this resource.

3.2 Pollutants of Concern from the Project

Table 1 identifies generally anticipated pollutants that might be generated from Priority Project Categories. Also refer to the Storm Water Requirements Applicability Checklist included in Appendix "A" at the end of this report.

Table 1: Anticipated and Potential Pollutants by Project Type (San Diego County SUSMP, Table 2-1)

✓ Anticipated Pollutants **P** Potential Pollutants	General Pollutant Categories								
Priority Project Categories	Sediments	Nutrients	Heavy Metals	Organic Substances	Trash and Debris	Oxygen-Demanding Substances	Oils and Grease	Bacteria and Viruses	Pesticides
Detached Residential Housing Development	**x**	**x**			**x**	**x**	**x**	**x**	**x**
Attached Residential Development	**x**	**x**			**x**	**P**(1)	**P**(2)	**P**	**x**
Commercial Development	**P**(1)	**P**(1)	**x**	**P**(2)	**x**	**P**(5)	**x**	**P**(3)	**P**(5)
Industrial Development	**x**		**x**	**x**	**x**	**x**	**x**		
Automotive Repair Shops			**x**	**x**(4)(5)	**x**		**x**		
Restaurants					**x**	**x**	**x**	**x**	**P**(1)
Steep Hillside Developments	**x**	**x**			**x**	**x**	**x**		**x**
Parking Lots	**P**(1)	**P**(1)	**x**		**x**	**P**(1)	**x**		**P**(1)
Streets, Highways, and Freeways	**x**	**P**(1)	**x**	**x**(4)	**x**	**P**(5)	**x**	**x**	**P**(1)
Retail Gasoline Outlets (RGO)			**x**	**x**	**x**	**x**	**x**		

X = anticipated

P = potential

(1) A potential pollutant if landscaping exists on-site

(2) A potential pollutant if the project includes uncovered parking areas

(3) A potential pollutant if land use involved food or animal waste product

(4) Including petroleum hydrocarbons

(5) Including solvents

An explanation of these pollutants is as follows:

1. Sediments – Sediments are soils or other surficial materials eroded and then transported or deposited by the action of wind, water, ice, or gravity. Sediments can increase turbidity, clog fish gills, reduce spawning habitat, lower young aquatic organisms survival rates, smother bottom dwelling organisms, and suppress aquatic vegetation growth.

2. Nutrients – Nutrients are inorganic substances such as nitrogen and phosphorus. They commonly exist in the form of mineral salts that are either dissolved or suspended in water. Primary sources of nutrients in urban runoff are fertilizers and eroded soils. Excessive discharge of nutrients to water bodies and streams can cause excessive aquatic algae and plant growth. Such excessive production, referred to as cultural eutophication, may lead to excessive decay of organic matter in the water body, loss of oxygen in the water, release of toxins in sediment, and the eventual death of aquatic organisms.

3. Heavy Metals – Metals are raw material components in non-metal products such as fuels, adhesives, paints, and other coatings. Primary sources of metal pollution in storm water are typically commercially available metals and metal products. Metals of concern include cadmium, chromium, copper, lead, mercury, and zinc. Lead and chromium have been used as corrosion inhibitors in primer coatings and cooling tower systems. At low concentrations naturally occurring in soil, metals are not toxic. However, at higher concentrations, certain metals can be toxic to aquatic life. Humans can be impacted from contaminated groundwater resources, and bioaccumulation of metals in fish and shellfish. Environmental concerns, regarding the potential for release of metals to the environment, have already led to restricted metal usage in certain applications.

4. Organic Compounds – Organic compounds are carbon-based. Commercially available or naturally occurring organic compounds are found in pesticides, solvents, and hydrocarbons. Organic compounds can, at certain concentrations, indirectly or directly constitute a hazard to life or health. When rinsing off objects, toxic levels of solvents and cleaning compounds can be discharged to storm drains. Dirt, grease, and grime retained in the cleaning fluid or rinse water may also adsorb levels of organic compounds that are harmful or hazardous to aquatic life.

5. Trash and Debris – Trash (such as paper, plastic, polystyrene packing foam, and aluminum materials) and biodegradable organic matter (such as leaves, grass cuttings, and food waste) are general waste products on the landscape. The presence of trash and debris may have a significant impact on the recreational value of a water body and aquatic habitat. Excess organic matter can create a

high biochemical oxygen demand in a stream and thereby lower its water quality. Also, in areas where stagnant water exists, the presence of excess organic matter can promote septic conditions resulting in the growth of undesirable organisms and the release of odorous and hazardous compounds such as hydrogen sulfide.

6. Oxygen-Demanding Substances – This category includes biodegradable organic material as well as chemicals that react with dissolved oxygen in water to form other compounds. Proteins, carbohydrates, and fats are examples of biodegradable organic compounds. The oxygen demand of a substance can lead to depletion of dissolved oxygen in a water body and possibly the development of septic conditions.

7. Oil and Grease – Oil and grease are characterized as high-molecular weight organic compounds. Primary sources of oil and grease are petroleum hydrocarbon products, motor products from leaking vehicles, esters, oils, fats, waxes, and high molecular-weight fatty acids. Introduction of these pollutants to the water bodies are very possible due to the wide use and applications of some of these products in municipal, residential, commercial, industrial, and construction areas. Elevated oil and grease content can decrease the aesthetic value of the water body, as well as the water quality.

8. Bacteria and Viruses – Bacteria and Viruses are ubiquitous microorganisms that thrive under certain environmental conditions. Their proliferation is typically caused by the transport of animal or human fecal wastes from the watershed. Water, containing excessive bacteria and viruses can alter the aquatic habitat and create a harmful environment for humans and aquatic life. Also, the decomposition of excess organic waste causes increased growth of undesirable organisms in the water.

9. Pesticides – Pesticides (including herbicides) are chemical compounds commonly used to control nuisance growth or prevalence of organisms. Excessive application of a pesticide may result in runoff containing toxic levels of its active component.

3.3 Pollutants of Concern in Receiving Waters

Beneficial Uses

The beneficial uses (i.e. Inland Surface Waters, Coastal Waters, and Ground Water) for the hydrologic unit are included in Tables 2 (Inland Surface Waters), 3 (Coastal Waters), and 4 (Ground Water). The Reservoirs and Lakes don't apply. These tables have been extracted from the Water Quality Control Plan for the San Diego Basin (i.e. Table 2-2, Table 2-3, and Table 2-5).

Table 2 – Beneficial Uses for Inland Surface Waters (Tecolote Creek, San Diego River)

Inland Surface Water	MUN	AGR	IND	PROC	GWR	FRSH	POW	REC 1	REC 2	BIOL	WARM	COLD	WILD	RARE	SPWM
Tecolote Creek	+							○	●		●		●		
San Diego River	+	●	●					●	●	●	●		●	●	

● Existing Beneficial Use
○ Potential Beneficial Use
\+ Excepted from MUN

Table 3 – Beneficial Uses for Coastal Waters (Mouth of San Diego River, Mission Bay)

Coastal Water	IND	NAV	REC 1	REC 2	COMM	BIOL	EST	WILD	RARE	MAR	AQUA	MIGR	SPWN	WARM	SHELL
San Diego River			●	●	●		●	●	●	●		●	●		●
Mission Bay	●		●	●	●		●	●	●	●		●	●		●

● Existing Beneficial Use

Table 4 - Beneficial Uses for Groundwater (Tecolote Creek, Sand Diego River -Mission San Diego)

Hydrologic Area	MUN	AGR	IND	PROC	FRSH	GWR
Tecolote Creek	+					
Mission San Diego	○	●	●	●		

\+ Excepted from MUN
● Existing Beneficial Use
○ Potential Beneficial Use

IND – Industrial Services Supply: Includes use of water for industrial activities that do not depend on water quality including, but not limited to, mining, cooling water supply, hydraulic conveyance, gravel washing, fire protection, or oil well re-pressurization.

NAV – Navigation: Includes uses of water for shipping, travel, or other transportation by private, military, or commercial vessels.

REC1 – Contact Water Recreation: Includes uses of water for recreational activities involving body contact with water, where ingestion of water is reasonably possible. These uses include, but are not limited to, swimming, wading, water-skiing, skin and SCUBA diving, surfing, white water activities, fishing, or use of natural hot springs.

REC2 - Non-contact Water Recreation: Includes the uses of water for recreational activities involving proximity to water, but not normally involving body contact with water, where ingestion of water is reasonably possible. These uses include, but are not limited to, picnicking, sunbathing, hiking, each combing, camping, boating, tidepool and marine life study, hunting, sightseeing, or aesthetic enjoyment in conjunction with the above activities.

COMM – Commercial and Sport Fishing: Includes the uses of water for commercial or recreational collection of fish, shellfish, or other organisms including, but not limited to, uses involving organisms intended for human consumption or bait purposes.

BIOL – Preservation of Biological Habitats of Special Significance: Includes uses of water that support designated areas or habitats, such as established refuges, parks, sanctuaries, ecological reserves, or Areas of Special Biological Significance (ASBS), where the preservation or enhancement of natural resources requires special protection.

EST – Estuarine Habitat: Includes uses of water that support estuarine ecosystems including, but not limited to, preservation or enhancement of estuarine habitats, vegetation, fish, shellfish, or wildlife (e.g., estuarine mammals, waterfowl, shorebirds).

WILD – Wildlife Habitat: Includes uses of water that support terrestrial ecosystems including, but not limited to, preservation and enhancement of terrestrial habitats, vegetation, wildlife (e.g., mammals, birds, reptiles, amphibians, invertebrates), or wildlife water and food sources.

RARE – Rare, Threatened, or Endangered Species: Includes uses of water that support habitats necessary, at least in part, for the survival and successful maintenance of plant or animal species established under state or federal law as rare, threatened or endangered.

MAR – Marine Habitat: Includes uses of water that support marine ecosystems including, but not limited to, preservation or enhancement of marine habitats, vegetation such as kelp, fish, shellfish, or wildlife (e.g., marine mammals, shorebirds).

AQUA – Aquaculture: Includes the uses of water for aquaculture or mariculture operations including, but not limited to, propagation, cultivation, maintenance, or harvesting of aquatic plants and animals for human consumption or bait purposes.

MIGR - Migration of Aquatic Organisms: Includes uses of water that support habitats necessary for migration, acclimatization between fresh and salt water, or other temporary activities by aquatic organisms, such as anadromous fish.

SPWN – Spawning, Reproduction, and/or EarlyDevelopment: Includes uses of water that support high quality aquatic habitats suitable for reproduction and early development of fish. This use is applicable only for the protection of anadromous fish.

WARM – Warm Freshwater Habitat: Includes uses of water that support warm water ecosystems including, but not limited to, preservation or enhancement of aquatic habitats, vegetation, fish or wildlife, including invertebrates.

SHELL – Shellfish Harvesting: Includes uses of water that support habitats suitable for the collection of filter-feeding shellfish (e.g., clams, oysters and mussels) for human consumption, commercial, or sport purposes.

MUN – Municipal and Domestic Supply: Includes uses of water for community, military, or individual water supply systems including, but not limited to, drinking water supply.

AGR – Agricultural Supply: Includes uses of water for farming, horticulture, or ranching including, but not limited to, irrigation, stock watering, or support of vegetation for range grazing.

PROC – *Industrial Process Supply:* Includes uses of water for industrial activities that depend primarily on water quality.

FRSH – Freshwater Replenishment*:* Includes uses of water for natural or artificial maintenance of surface water quantity or quality (e.g., salinity).

GWR - Ground Water Recharge: Includes uses of water for natural or artificial recharge of ground water for purposes of future extraction, maintenance of water quality, or halting of saltwater intrusion into freshwater aquifers.

Downstream Impaired Water Bodies

According to Storm Water Requirements Applicability Checklist, the portion of the campus that drains directly to Tecolote Canyon is considered to directly discharge to impaired or water quality sensitive areas. Also, based on the California 2010 303(d) list published by the San Diego Regional Water Quality Control Board (RWQCB Region 9),

there are downstream impaired water bodies. These include Mission Bay at the mouth of Tecolote Creek (eutrophic and lead), Tecolote Creek (cadmium, copper, indicator bacteria, lead, nitrogen, phosphorus, selenium, toxicity, turbidity, and zinc) and Mission Bay Shoreline at Tecolote Shores (enterococcus and total coliform bacteria). These impaired bodies are currently listed under a Total Maximum Daily Load (TMDL) 5A status where a TMDL is required but not yet completed. The expected completion dates for the TMDL for the downstream impaired water bodies ranges from 2019 through 2021.

3.4 Impacts

Correlating the watershed pollutants of concern, the potential pollutants from this development, and the known impairments of the downstream water bodies reveals several pollutants of concern. The pollutants of concern include sediments, nutrients, heavy metals, trash and debris, oil and grease, pesticides, organic substances, oxygen demanding substances, bacteria and viruses, and coliform bacteria.

The proposed project could impact water quality in both the short- and long-term. Short term impacts would occur during construction. The proposed project could impact water quality during construction if sediment is allowed to flow offsite. The downstream impacts due to the development will be mitigated by erosion control measures implemented during the construction phase. Long-term impacts would be related to the subsequent building. These impacts will be mitigated by installation of the BMPs identified in this report.

4.0 Best Management Practices

Best management practices is defined by any schedule of activities, prohibitions of practices, general good housekeeping practices, pollution prevention and educational practices, maintenance procedures, structural treatment BMPs, and other management practices to prevent or reduce to the maximum extent practicable the discharge of pollutants directly or indirectly to receiving waters. Construction Storm Water BMPs are practices, procedures, devices, or materials used to prevent the transport and introduction of pollutants both on and from a project site during construction. The selected BMPs must meet or exceed the minimum specified in both the statewide Construction General Permit (2009-0009-DWQ) and the San Diego Regional MS4 Permit.

Post-Construction BMPs shall be incorporated into the project design, in the following progression (and as described in detail below)

<u>Standard and Priority Development Projects:</u>

- Source Control (SC) BMPs
- Site Design (SD) BMPs

Priority Development Projects:

- Pollutant Control BMPs
- Hydromodification Management BMPs

The following subsections address each of these post-construction BMP's as related to this project.

4.1 Source Control BMPs

The implementation of Source Control BMPs should reduce the potential for urban runoff to pick up and transport pollutants. The following is a list of Source Control BMPs required by the City according to section 4.2 of their Storm Water Standards. In addition, an explanation of how each applicable BMPs may be incorporated into the project.

SC-1: Prevent Illicit Discharges into the MS4

An illicit discharge is any discharge to the MS4 that is not composed entirely of storm water except discharges pursuant to a National Pollutant Discharge Elimination System permit and discharges resulting from firefighting activities.

> *Projects will effectively eliminate discharges of non-storm water into the MS4. This may involve a suite of housekeeping BMPs which could include effective irrigation, dispersion of non-storm water discharges into landscaping for infiltration. Wash water from vehicle washing is not anticipated for any of the proposed projects.*

SC-2: Identify the Storm Drain System Using Stenciling or Signage

Storm drain signs and stencils are visible source controls typically placed adjacent to the inlets. Posting notices regarding discharge prohibitions at storm drain inlets can prevent waste dumping. Stenciling shall be provided for all storm water conveyance system inlets and catch basins within the project area. Inlet stenciling may include concrete stamping, concrete painting, placards, or other methods approved by the local municipality. In addition to storm drain stenciling, projects are encouraged to post signs and prohibitive language (with graphical icons) which prohibit illegal dumping at trailheads, parks, building entrances and public access points along channels and creeks within the project area.

> *Signage and striping will be provided and language will be satisfactory to the City Engineer.*

SC-3: Protect Outdoor Material Storage Areas from Rainfall, Run-on, Runoff and Wind Dispersal

Materials with the potential to pollute storm water runoff shall be stored in a manner that prevents contact with rainfall and storm water runoff. Contaminated runoff shall be managed for treatment and disposal (e.g. secondary containment directed to sanitary sewer, approval must be obtained from the sanitary sewer agency). All development projects shall incorporate the following structural or pollutant control BMPs for outdoor material storage areas, as applicable and feasible:

Materials with the potential to contaminate storm water shall be:

- Placed in an enclosure such as, but not limited to, a cabinet, or similar structure, or under a roof or awning that prevents contact with rainfall runoff or spillage to the storm water conveyance system; or
- Protected by secondary containment structures such as berms, dikes, or curbs.
- The storage areas shall be paved and sufficiently impervious to contain leaks and spills, where necessary.
- The storage area shall be sloped towards a sump or another equivalent measure that is effective to contain spills.
- Runoff from downspouts/roofs shall be directed away from storage areas.
- The storage area shall have a roof or awning that extends beyond the storage area to minimize collection of storm water within the secondary containment area. A manufactured storage shed may be used for small containers.

No outdoor material storage areas are proposed.

SC-4: Protect Materials Stored in Outdoor Work Areas from Rainfall, Run-on, Runoff, and Wind Dispersal

Outdoor work areas have an elevated potential for pollutant loading and spills. All development projects shall include the following structural or pollutant control BMPs for any outdoor work areas with potential for pollutant generation, as applicable and feasible:

- Create an impermeable surface such as concrete or asphalt, or a prefabricated metal drip pan, depending on the size needed to protect the materials.
- Cover the area with a roof or other acceptable cover.
- Berm the perimeter of the area to prevent water from adjacent areas from flowing on to the surface of the work area.
- Directly connect runoff to sanitary sewer or other specialized containment system(s), as needed and where feasible. This allows the more highly concentrated pollutants from these areas to receive special treatment that removes particular constituents. Approval for this connection must be obtained from the appropriate sanitary sewer agency.
- Locate the work area away from storm drains or catch basins.

No outdoor work areas are proposed.

SC-5: Protect Trash Storage Areas from Rainfall, Run-on, Runoff, and Wind Dispersal

Storm water runoff from areas where trash is stored or disposed of can be polluted. In addition, loose trash and debris can be easily transported by water or wind into nearby storm drain inlets, channels, and/or creeks. All development projects shall include the following structural or pollutant control BMPs, as applicable:

- Design trash container areas so that drainage from adjoining roofs and pavement is diverted around the area(s) to avoid run-on. This can include berming or grading the waste handling area to prevent run-on of storm water.
- Ensure trash container areas are screened or walled to prevent offsite transport of trash.
- Provide roofs, awnings, or attached lids on all trash containers to minimize direct precipitation and prevent rainfall from entering containers.
- Locate storm drains away from immediate vicinity of the trash storage area and vice versa.
- Post signs on all dumpsters informing users that hazardous material are not to be disposed.

Future trash storage areas will be located within structures or covered. If located outside of the structure(s), they will include lids to prevent rainfall intrusion and required signage.

4.2 Site Design BMPs

Site design BMPs (also referred to as LID BMPs) are intended to reduce the rate and volume of storm water runoff and associated pollutant loads. The following is a list of Site Design BMPs required by the City according to section 4.3 of their Storm Water Standards. In addition, an explanation of how each applicable BMPs may be incorporated into the project.

SD-1: Maintain Natural Drainage Pathways and Hydrologic Features

During the site assessment, natural drainages must be identified along with their connection to creeks and/or streams, if any. Natural drainages offer a benefit to storm water management as the soils and habitat already function as a natural filtering/infiltrating swale. When determining the development footprint of the site, altering natural drainages should be avoided. By providing a development envelope set back from natural drainages, the drainage can retain some water quality benefits to the watershed. In some situations, site constraints, regulations, economics, or other factors may not allow avoidance of drainages and sensitive areas. Projects proposing to dredge or fill materials in Waters of the U.S. must obtain Clean Water Act Section 401 Water Quality Certification. Projects proposing to dredge or fill waters of the State must obtain waste discharge requirements. Both the 401 Certification and the Waste Discharge Requirements are administered by the San Diego Water Board. The project applicant shall consult the local jurisdiction for other specific requirements.

Projects can incorporate SD-1 into a project by implementing the following planning and design phase techniques as applicable and practicable:

- Evaluate surface drainage and topography in considering selection of Site Design BMPs that will be most beneficial for a given project site. Where feasible, maintain topographic depressions for infiltration.
- Optimize the site layout and reduce the need for grading. Where possible, conform the site layout along natural landforms, avoid grading and disturbance of vegetation and soils, and replicate the site's natural drainage patterns. Integrating existing drainage patterns into the site plan will help maintain the site's predevelopment hydrologic function.
- Preserve existing drainage paths and depressions, where feasible and applicable, to help maintain the time of concentration and infiltration rates of runoff, and decrease peak flow.
- Structural BMPs cannot be located in buffer zones if a State and/or Federal resource agency (e.g. SDRWQCB, California Department of Fish and Wildlife; U.S. Army Corps of Engineers, etc.) prohibits maintenance or activity in the area.

  To the maximum extent practicable, each project will implement all of the above. Structural BMPs will be not be located within buzzer zones or environmentally sensitive areas.

SD-2: Conserve Natural Areas, Soils and Vegetation.

To enhance a site's ability to support source control and reduce runoff, the conservation and restoration of natural areas must be considered in the site design process. By conserving or restoring the natural drainage features, natural processes are able to intercept storm water, thereby reducing the amount of runoff.

Projects can incorporate SD-2 by implementing the following planning and design phase techniques as applicable and practicable:

- Identify areas most suitable for development and areas that should be left undisturbed. Additionally, reduced disturbance can be accomplished by increasing building density and increasing height, if possible.
- Cluster development on least-sensitive portions of a site while leaving the remaining land in a natural undisturbed condition.
- Avoid areas with thick, undisturbed vegetation. Soils in these areas have a much higher capacity to store and infiltrate runoff than disturbed soils, and reestablishment of a mature vegetative community can take decades. Vegetative cover can also provide additional volume storage of rainfall by retaining water on the surfaces of leaves, branches, and trunks of trees during and after storm events.

- Preserve trees, especially native trees and shrubs, and identify locations for planting additional native or drought tolerant trees and large shrubs.
- In areas of disturbance, topsoil should be removed before construction and replaced after the project is completed. When handled carefully, such an approach limits the disturbance to native soils and reduces the need for additional (purchased) topsoil during later phases.
- Avoid sensitive areas, such as wetlands, biological open space areas, biological mitigation sites, streams, floodplains, or particular vegetation communities, such as coastal sage scrub and intact forest. Also, avoid areas that are habitat for sensitive plants and animals, particularly those, State or federally listed as endangered, threatened or rare. Development in these areas is often restricted by federal, state and local laws.

  Where feasible, natural areas, sensitive hillside areas, and significant trees will be preserved for each project identified.

SD-3: Minimize Impervious Areas

Impervious cover can be minimized through identification of the smallest possible land area that can be practically impacted or disturbed during site development. Reducing impervious surfaces retains the permeability of the project site, allowing natural processes to filter and reduce sources of pollution.

Projects can incorporate SD-3 by implementing the following planning and design phase techniques as applicable and practicable:

- Decrease building footprint through (the design of compact and taller structures when allowed by the City zoning and design standards and provided public safety is not compromised.
- Construct walkways, trails, patios, overflow parking lots, alleys and other low-traffic areas with permeable surfaces.
- Construct streets, sidewalks and parking lot aisles to the minimum widths necessary, provided that public safety and alternative transportation (e.g. pedestrians, bikes) are not compromised.
- Consider the implementation of shared parking lots and driveways where possible.
- Landscaped area in the center of a cul-de-sac can reduce impervious area depending on configuration. Design of a landscaped cul-de-sac must be coordinated with fire department personnel to accommodate turning radii and other operational needs.
- Design smaller parking lots with fewer stalls, smaller stalls, more efficient lanes.
- Design parking indoors or underground.
- Minimize the use of impervious surfaces in the landscape design.

Where feasible, surface parking and hardscape adjacent to the building will be minimized while still satisfying City standards. The proposed projects will include landscaping throughout to promote disconnection of impervious surfaces. Where feasible, the project will incorporate pervious surfaces to reduce the amount of impervious surfaces.

SD-4: Minimize Soil Compaction

The upper soil layers contain organic material, soil biota, and a configuration favorable for storing and slowly conveying storm water down gradient. By protecting native soils and vegetation in appropriate areas during the clearing and grading phase of development the site can retain some of its existing beneficial hydrologic function. Soil compaction resulting from the movement of heavy construction equipment can reduce soil infiltration rates. It is important to recognize that areas adjacent to and under building foundations, roads and manufactured slopes must be compacted with minimum soil density requirements in compliance with the City WHITEBOOK.

Projects can incorporate SD-4 by implementing the following planning and design phase techniques as applicable and practicable:

- Avoid disturbance in planned green space and proposed landscaped areas where feasible. These areas that are planned for retaining their beneficial hydrological function should be protected during the grading/construction phase so that vehicles and construction equipment do not intrude and inadvertently compact the area.
- In areas planned for landscaping where compaction could not be avoided, re-till the soil surface to allow for better infiltration capacity. Soil amendments are recommended and may be necessary to increase permeability and organic content. Soil stability, density requirements, and other geotechnical considerations associated with soil compaction must be reviewed by a qualified landscape architect or licensed geotechnical, civil or other professional engineer.

To the maximum extent practicable, the design of each project will comply with this item.

SD-5: Disperse Impervious Area

Impervious area dispersion (dispersion) refers to the practice of essentially disconnecting impervious areas from directly draining to the storm drain system by routing runoff from impervious areas such as rooftops, walkways, and driveways onto the surface of adjacent pervious areas. The intent is to slow runoff discharges, and reduce volumes while achieving incidental treatment. Volume reduction from dispersion is dependent on the infiltration characteristics of the pervious area and the amount of impervious area draining to the pervious area. Treatment is achieved through filtration, shallow sedimentation, sorption, infiltration, evapotranspiration, biochemical processes and plant uptake.

Projects can incorporate SD-5 by implementing the following planning and design phase techniques as applicable and practicable:

- Implement design criteria and considerations listed in impervious area dispersion fact sheet (SD-5) presented in Appendix E.
- Drain rooftops into adjacent landscape areas.
- Drain impervious parking lots, sidewalks, walkways, trails, and patios into adjacent landscape areas.
- Reduce or eliminate curb and gutters from roadway sections or place curb openings, thus allowing roadway runoff to drain to adjacent pervious areas.
- Replace curbs and gutters with roadside vegetated swales or place curb openings and direct runoff from the paved street or parking areas to adjacent LID facilities. Such an approach for alternative design can reduce the overall capital cost of the site development while improving the storm water quantity and quality issues and the site's aesthetics.
- Plan site layout and grading to allow for runoff from impervious surfaces to be directed into distributed permeable areas such as turf, landscaped or permeable recreational areas, medians, parking islands, planter boxes, etc.
- Detain and retain runoff throughout the site. On flatter sites, landscaped areas can be interspersed among the buildings and pavement areas. On hillside sites, drainage from upper areas may be collected in conventional catch basins and conveyed to landscaped areas in lower areas of the site.
- Pervious area that receives run on from impervious *surfaces shall have a minimum width of 10 feet and a maximum slope of 5%.*

  Where feasible, the design of each project will include discharging roof drainage onto the surface and directing it to landscape areas. In addition, the design of each project will include discharging runoff from parking and hardscape areas into adjacent landscape areas.

SD-6: Collect Runoff

Distributed control of storm water runoff from the site can be accomplished by applying small collection techniques (e.g. green roofs), or integrated management practices, on small sub-catchments or on residential lots. Small collection techniques foster opportunities to maintain the natural hydrology provide a much greater range of control practices. Integration of storm water management into landscape design and natural features of the site, reduce site development and long-term maintenance costs, and provide redundancy if one technique fails. On flatter sites, it typically works best to intersperse landscaped areas and integrate small scale retention practices among the buildings and paving.

Permeable pavements contain small voids that allow water to pass through to a gravel base. They come in a variety of forms; they may be a modular paving system (concrete pavers, grass-pave, or gravel-pave) or poured in place pavement (porous concrete,

permeable asphalt). Project applicants should identify locations where permeable pavements could be substituted for impervious concrete or asphalt paving. The O&M of the site must ensure that permeable pavements will not be sealed in the future. In areas where infiltration is not appropriate, permeable paving systems can be fitted with an under drain to allow filtration, storage, and evaporation, prior to drainage into the storm drain system.

Projects can incorporate SD-6 by implementing the following planning and design phase techniques as applicable and practicable:

- Implementing distributed small collection techniques to collect and retain runoff
- Installing permeable pavements

Where feasible, the design of each project will include the use of intergraded management practices and permeable pavements.

SD-7: Landscape with Native or Drought Tolerant Species

All development projects are required to select a landscape design and plant palette that minimizes required resources (irrigation, fertilizers and pesticides) and pollutants generated from landscape areas. Native plants require less fertilizers and pesticides because they are already adapted to the rainfall patterns and soils conditions. Plants should be selected to be drought tolerant and not require watering after establishment (2 to 3 years). Watering should only be required during prolonged dry periods after plants are established. Final selection of plant material needs to be made by a landscape architect experienced with LID techniques. Microclimates vary significantly throughout the region and consulting local municipal resources will help to select plant material suitable for a specific geographic location.

Projects can incorporate SD-7 by landscaping with native and drought tolerant species.

Each project will implement the use of native and drought tolerant landscaping.

SD-8: Harvest and Use Precipitation

Harvest and use BMPs capture and stores storm water runoff for later use. Harvest and use can be applied at smaller scales (Standard Projects) using rain barrels or at larger scales (PDPs) using cisterns. This harvest and use technique has been successful in reducing runoff discharged to the storm drain system conserving potable water and recharging groundwater.

Rain barrels are above ground storage vessels that capture runoff from roof downspouts during rain events and detain that runoff for later reuse for irrigating landscaped areas. The temporary storage of roof runoff reduces the runoff volume from a property and

may reduce the peak runoff velocity for small, frequently occurring storms. In addition, by reducing the amount of storm water runoff that flows overland into a storm water conveyance system (storm drain inlets and drain pipes), less pollutants are transported through the conveyance system into local creeks and the ocean. The reuse of the detained water for irrigation purposes leads to the conservation of potable water and the recharge of groundwater. Projects can incorporate SD-8 by installing rain barrels or cisterns, as applicable.

Each project will evaluate the feasibility of harvest and reuse of storm water in accordance with the Storm Water Standards Manual requirements.

4.3 Pollutant Control BMPs

The implementation of Pollutant Control BMPs into the project is required to remove pollutants contained in storm runoff. Table 5, Structural BMP Pollutant Control Selection Matrix, identifies the possible BMPs, target pollutants, and anticipated removal efficiencies of each BMP.

Table 5 – Structural BMP Pollutant Control Selection Matrix

BMP	LID	HMP Control	Sediment	Nutrients	Trash	Metals	Bacteria	Oils & Grease	Organics
Infiltration Basin	Y	Y	H	H	H	H	H	H	H
Bioretention Basin	Y	Y	H	M	H	H	H	H	H
Cistern Plus Bioretention	Y	Y	H	M	H	H	H	H	H
Vault plus Bioretention	Y	Y	H	M	H	H	H	H	H
Self-retaining Area	Y	Y	H	H	H	H	H	H	H
Dry Wells	Y	Y	H	H	H	H	H	H	H
Constructed Wetlands	Y	Y	H	M	H	H	H	H	H
Extended Detention Basin	Y	Y	M	L	H	M	M	M	M
Vegetated Swale	Y	N	M	L	L	M	L	M	M
Vegetated Buffer Strips	Y	N	H	L	M	H	L	H	M
Flow-Through Planter Boxes	Y	Y	H	M	H	H	H	H	H
Vortex Separator or Wet Vault	N	N	M	L	M	L	L	L	L
Media Filter	N	N	H	L	H	H	M	H	H

The following is a list of potential Pollutant Control BMPs that could be used throughout the campus.

- Infiltration Basins
- Bio-retention Basins
- Cistern plus Bio-retention
- Vault plus Bio-retention
- Self-Treating and Retaining Landscape Areas
- Dry Wells
- Constructed Wetlands
- Flow Through Planter Boxes
- Flow Through Bio-retention and/or Media Filters
- Certified Modular Wetland Units

The final selection of Pollutant Control BMPs will be based on an individual project's pollutants of concern, site constraints, the feasibility of rainwater harvesting and reuse, underlying soil condition and feasibility of infiltration (full or partial). This information will be identified as part of each project's site specific SWQMP that shall be submitted to the City of San Diego for approval as part of the Substantial Conformance Review (SCR) or ministerial permitting process. Each project's final site specific SWQMP shall include discussion and calculations to determine if and how Pollutant Control BMPs can be implement to retain and reuse and/or infiltrate the volume of storm water runoff produced from a 24-hour, 85th percentile storm event (Design Capture Volume (DCV)). If storage or infiltration of the full DCV is not feasible, then Bio-Filtration facilities shall be sized to treat 1.5 times the volume or hold 75% of the Design Capture Volume. The Final SWQMP shall also include an exhibit identifying the location of each BMP as well as the Drainage Management Areas (DMAs) used to size the BMP.

Given preliminary soils information and site constraints, and consistent with the conservative and conceptual approach at this phase, it is assumed that Bio-Filtration will be the primary method of treating and retaining storm water. To identify the largest possible surface area, Pollutant Control facilities have been sized in this preliminary SWQMP as lined Bio-Filtration Basins (Flow-Through Planters) using the BMP Sizing Spreadsheet (source projectcleanwater.org). Again, final Pollutant Control Facilities will be selected at the time of Substantial Conformance Review (SCR) or ministerial permit based on the underlying soils conditions as well as the feasibility of harvest and use and infiltration practices. Regardless of type, the final Pollutant Treatment Control facilities and associated site/project specific SWQMP will be required to demonstrate compliance with the storm water permit requirements in place at the time of the SCR and/or ministerial permits.

4.4 Hydromodification Management Facilities

The implementation of Hydromodification Management Facilities (HMFs) into the project is required to maintain or reduce pre-project downstream erosion and protect stream habitat. For the purposes of this report, it is understood that all Priority Development Projects (PDP) projects will be required to implement HMFs.

To identify the largest possible surface area, HMFs in this report have been sized as bio-filtration basins with impermeable liner (i.e. flow-through planters with no separate storage vault) using the BMP Sizing Spreadsheet. In addition, the downstream susceptibility to erosion was assumed to be 'High', again creating the need for the largest possible surface area. The final election and design of the post construction HMFs may however, be based on the actual downstream susceptibility to erosion and may be comprised of various BMPs including but not limited to bio-filtration basins with underground hydromodification storage Cisterns/Vaults. Refer to Appendix "D" for preliminary HMF sizing calculations.

While this report has utilized the requirements that were enacted on February 16, 2016, the final determination regarding the applicability of hydromodification requirements and final calculations will be based on the requirements in place at the time of SCR and/or ministerial permitting. To address these requirements a final project specific SWQMP will be required and shall include hydromodification and treatment control calculations for each BMP demonstrating compliance with flow control and DCV requirements (e.g. worksheets W.2.1 and W.5.1). In addition, the final project specific SWQMP shall include drawdown calculations consistent with the City's storm water standards, orifice design calculations required for flow control requirements and finally exhibits and discussion on how potential impacts, if any, to Critical Coarse Sediment Yield Areas (CCSYA) will be mitigated.

4.5 50% Rule

The 2016 Draft Model BMP Design Manual includes a section called *Special Considerations for Redevelopment Projects (50% Rule).* This section states:

> *If the project is a redevelopment project, the structural BMP performance requirements and hydromodification management requirements apply to redevelopment PDPs as follows:*
> *(a) Where redevelopment results in the creation or replacement of impervious surface in an amount of less than fifty percent of the surface area of the previously existing development, then the structural BMP performance requirements of Provision E.3.c [of the MS4 Permit] apply only to the creation or replacement of impervious surface, and not the entire development; or*
> *(b) Where redevelopment results in the creation or replacement of impervious surface in an amount of more than fifty percent of the surface area of the*

previously existing development, then the structural BMP performance requirements of Provision E.3.c [of the MS4 Permit] apply to the entire development.

For the purpose of calculating the ratio, the surface area of the previously existing development shall be the area of impervious surface within the previously existing development.

This ratio was calculated for each of the sub-basins, drainage basins, and campus overall. In all cases the proposed projects are below the 50% threshold. Drainage basins and existing imperious areas can be found in the Preliminary Drainage Report. Proposed impervious area are shown in the tables in Appendix D of this report.

Drainage from areas outside of the project limits will be diverted around the project when feasible. When site constraints render this infeasible, the BMPs will be sized to account for this flow. The BMP sizing shown in Appendix D assumes that there are no offsite flows into the project site. Each project will be reviewed on a case by case basis during final engineering. The Drainage Report and Storm Water Quality Management Plan submitted with the Substantial Conformance Review (SCR) and ministerial permitting phases will address this issue.

TABLE 6-IMPERVIOUS AREA CALCULATION (50% RULE)

DEVELOPED CONDITIONS

BASIN NUMBER	AREA (acres)	EXIST. IMPERVIOUS AREA (acres)	IMPERVIOUS AREA OF PROPOSED PROJECTS (acres)	%	INCREASE OR REPLACE 50% OR MORE?
L1	45.50	23.32	8.48	0.36	NO
M1	5.44	4.36	0.86	0.20	NO
N1	33.01	21.88	5.24	0.24	NO
O1	4.45	1.35	0.66	0.49	NO
P1	3.77	1.01	0.00	0.00	NO
SUB-TOTAL TECOLOTE CANYON	***92.17***	***51.91***	***15.25***	**0.29**	**NO**

DEVELOPED CONDITIONS

BASIN NUMBER	AREA (acres)	EXIST. IMPERVIOUS AREA (acres)	IMPERVIOUS AREA OF PROPOSED PROJECTS (acres)	%	INCREASE OR REPLACE 50% OR MORE?
Q1	36.25	21.40	4.40	0.2	NO
SUB-TOTAL MORENA BLVD	***36.25***	***21.40***	***4.40***	**0.2**	**NO**

DEVELOPED CONDITIONS

BASIN NUMBER	AREA (acres)	EXIST. IMPERVIOUS AREA (acres)	OF PROPOSED PROJECTS (acres)	%	INCREASE OR REPLACE 50% OR MORE?
R1	5.90	4.72	0.00	0.00	NO
S1	9.99	4.41	0.09	0.02	NO
T1	8.86	3.47	0.00	0.00	NO
U1	24.02	15.34	6.18	0.40	NO
V1	8.97	7.18	2.66	0.37	NO
SUB-TOTAL SAN DIEGO RIVER	***57.75***	***35.12***	***8.92***	**0.3**	**NO**

5.0 Construction BMPs

The project will be designed to include the most current BMPs relating to construction activity. BMPs to be used may include:

- Specific vehicle maintenance areas
- Material storage areas
- Equipment Storage areas
- Waste containment areas
- Concrete washout areas
- Erosion/sediment control BMP's
    - Gravel Bag Chevrons
    - Gravel Bag Inlet Protection
- Offsite Sediment Control
    - Stabilized construction entrances

Erosion control plans with notes and locations of BMP's will be part of the final project construction plans for each project identified in the USD Campus 2015 Master Plan as implemented. It must be understood though that a construction site is constantly changing and the contractor will be responsible for removing, adding and adjusting BMPs as required to meet the intent of Federal, State and local laws and ordinances relating to construction activity and the reduction of construction related pollution.

6.0 Operation and Maintenance Procedures

6.1 Storm Water BMP Maintenance

In order for this plan to be effective and meet the performance standards identified in Federal, State and local ordinances, a long term maintenance plan is required.

USD Facilities Maintenance staff and their contractors are responsible for maintaining construction activity BMPs. USD will be responsible for long term maintenance of the private storm drain facilities and BMPs.

6.2 Annual BMP Maintenance Cost

Estimates for vault maintenance shall be determined on a project-by-project basis. USD will be fiscally responsible for maintenance costs of private storm drain facilities and BMPs.

Appendix A Example Storm Water Requirements Applicability Checklist

Note: All projects will be required to submit individual Storm Water Requirements Applicability Checklists at the time of the SCR application and ministerial permitting. Note that the checklist included herein may not be the current version at the time of the future SCR or ministerial permitting and that the applicant will be required to use the current version available at the time.

THE CITY OF SAN DIEGO
City of San Diego
Development Services
1222 First Ave., MS-302
San Diego, CA 92101
(619) 446-5000

Storm Water Requirements Applicability Checklist

FORM
DS-560
FEBRUARY 2016

Project Address:	Project Number *(for City Use Only):*

SECTION 1. Construction Storm Water BMP Requirements:

All construction sites are required to implement construction BMPs in accordance with the performance standards in the Storm Water Standards Manual. Some sites are additionally required to obtain coverage under the State Construction General Permit (CGP)[1] , which is administered by the State Water Resources Control Board.

For all project complete PART A: If project is required to submit a SWPPP or WPCP, continue to PART B.

PART A: Determine Construction Phase Storm Water Requirements.

1. Is the project subject to California's statewide General NPDES permit for Storm Water Discharges Associated with Construction Activities, also known as the State Construction General Permit (CGP)? (Typically projects with land disturbance greater than or equal to 1 acre.)

   ❑ Yes; SWPPP required, skip questions 2-4 ❑ No; next question

2. Does the project propose construction or demolition activity, including but not limited to, clearing, grading, grubbing, excavation, or any other activity that results in ground disturbance and contact with storm water runoff?

   ❑ Yes; WPCP required, skip 3-4 ❑ No; next question

3. Does the project propose routine maintenance to maintain original line and grade, hydraulic capacity, or original purpose of the facility? (Projects such as pipeline/utility replacement)

   ❑ Yes; WPCP required, skip 4 ❑ No; next question

4. Does the project only include the following Permit types listed below?
   - Electrical Permit, Fire Alarm Permit, Fire Sprinkler Permit, Plumbing Permit, Sign Permit, Mechanical Permit, Spa Permit.
   - Individual Right of Way Permits that exclusively include only ONE of the following activities: water service, sewer lateral, or utility service.
   - Right of Way Permits with a project footprint less than 150 linear feet that exclusively include only ONE of the following activities: curb ramp, sidewalk and driveway apron replacement, pot holing, curb and gutter replacement, and retaining wall encroachments.

   ❑ Yes; no document required

Check one of the boxes to the right, and continue to PART B:

❑ If you checked "Yes" for question 1,
a SWPPP is REQUIRED. Continue to PART B

❑ If you checked "No" for question 1, and checked "Yes" for question 2 or 3,
a WPCP is REQUIRED. If the project proposes less than 5,000 square feet of ground disturbance AND has less than a 5-foot elevation change over the entire project area, a Minor WPCP may be required instead. **Continue to PART B.**

❑ If you checked "No" for all questions 1-3, and checked "Yes" for question 4
PART B **does not apply and no document is required. Continue to Section 2.**

1. More information on the City's construction BMP requirements as well as CGP requirements can be found at: www.sandiego.gov/stormwater/regulations/index.shtml

PART B: Determine Construction Site Priorit

This prioritization must be completed within this form, noted on the plans, and included in the SWPPP or WPCP. The city reserves the right to adjust the priority of projects both before and after construction. Construction projects are assigned an inspection frequency based on if the project has a "high threat to water quality." The City has aligned the local definition of "high threat to water quality" to the risk determination approach of the State Construction General Permit (CGP). The CGP determines risk level based on project specific sediment risk and receiving water risk. Additional inspection is required for projects within the Areas of Special Biological Significance (ASBS) watershed. **NOTE:** The construction priority does **NOT** change construction BMP requirements that apply to projects; rather, it determines the frequency of inspections that will be conducted by city staff.

Complete PART B and continued to Section 2

1. ❑ **ASBS**

a. Projects located in the ASBS watershed.

2. ❑ **High Priority**

a. Projects 1 acre or more determined to be Risk Level 2 or Risk Level 3 per the Construction General Permit and not located in the ASBS watershed.

b. Projects 1 acre or more determined to be LUP Type 2 or LUP Type 3 per the Construction General Permit and not located in the ASBS watershed.

3. ❑ **Medium Priority**

a. Projects 1 acre or more but not subject to an ASBS or high priority designation.

b. Projects determined to be Risk Level 1 or LUP Type 1 per the Construction General Permit and not located in the ASBS watershed.

4. ❑ **Low Priority**

a. Projects requiring a Water Pollution Control Plan but not subject to ASBS, high, or medium priority designation.

SECTION 2. Permanent Storm Water BMP Requirements.

Additional information for determining the requirements is found in the Storm Water Standards Manual.

PART C: Determine if Not Subject to Permanent Storm Water Requirements.

Projects that are considered maintenance, or otherwise not categorized as "new development projects" or "redevelopment projects" according to the Storm Water Standards Manual are not subject to Permanent Storm Water BMPs.

If "yes" is checked for any number in Part C, proceed to Part F and check "Not Subject to Permanent Storm Water BMP Requirements".

If "no" is checked for all of the numbers in Part C continue to Part D.

1.	Does the project only include interior remodels and/or is the project entirely within an existing enclosed structure and does not have the potential to contact storm water?	❑ Yes ❑ No
2.	Does the project only include the construction of overhead or underground utilities without creating new impervious surfaces?	❑ Yes ❑ No
3.	Does the project fall under routine maintenance? Examples include, but are not limited to: roof or exterior structure surface replacement, resurfacing or reconfiguring surface parking lots or existing roadways without expanding the impervious footprint, and routine replacement of damaged pavement (grinding, overlay, and pothole repair).	❑ Yes ❑ No

PART D: PDP Exempt Requirements.

PDP Exempt projects are required to implement site design and source control BMPs.

If "yes" was checked for any questions in Part D, continue to Part F and check the box labeled "PDP Exempt."

If "no" was checked for all questions in Part D, continue to Part E.

1. Does the project ONLY include new or retrofit sidewalks, bicycle lanes, or trails that:
   - Are designed and constructed to direct storm water runoff to adjacent vegetated areas, or other non-erodible permeable areas? Or;
   - Are designed and constructed to be hydraulically disconnected from paved streets and roads? Or;
   - Are designed and constructed with permeable pavements or surfaces in accordance with the Green Streets guidance in the City's Storm Water Standards manual?

   ❑ Yes; PDP exempt requirements apply ❑ No; next question

2. Does the project ONLY include retrofitting or redeveloping existing paved alleys, streets or roads designed and constructed in accordance with the Green Streets guidance in the City's Storm Water Standards Manual?

   ❑ Yes; PDP exempt requirements apply ❑ No; project not exempt. PDP requirements apply

PART E: Determine if Project is a Priority Development Project (PDP).
Projects that match one of the definitions below are subject to additional requirements including preparation of a Storm Water Quality Management Plan (SWQMP).

If "yes" is checked for any number in PART E, continue to PART F.

If "no" is checked for every number in PART E, continue to PART F and check the box labeled "Standard Development Project".

1.	**New Development that creates 10,000 square feet or more of impervious surfaces collectively over the project site.** This includes commercial, industrial, residential, mixed-use, and public development projects on public or private land.	❑ Yes ❑ No
2.	**Redevelopment project that creates and/or replaces 5,000 square feet or more of impervious surfaces on an existing site of 10,000 square feet or more of impervious surfaces**. This includes commercial, industrial, residential, mixed-use, and public development projects on public or private land.	❑ Yes ❑ No
3.	**New development or redevelopment of a restaurant.** Facilities that sell prepared foods and drinks for consumption, including stationary lunch counters and refreshment stands selling prepared foods and drinks for immediate consumption (SIC 5812), and where the land development creates and/or replace 5,000 square feet or more of impervious surface.	❑ Yes ❑ No
4.	**New development or redevelopment on a hillside.** The project creates and/or replaces 5,000 square feet or more of impervious surface (collectively over the project site) and where the development will grade on any natural slope that is twenty-five percent or greater.	❑ Yes ❑ No
5.	**New development or redevelopment of a parking lot that creates and/or replaces 5,000 square feet or more of impervious surface (collectively over the project site).**	❑ Yes ❑ No
6.	**New development or redevelopment of streets, roads, highways, freeways, and driveways.** The project creates and/or replaces 5,000 square feet or more of impervious surface (collectively over the project site).	❑ Yes ❑ No

7. **New development or redevelopment discharging directly to an Environmentally Sensitive Area.** The project creates and/or replaces 2,500 square feet of impervious surface (collectively over project site), and discharges directly to an Environmentally Sensitive Area (ESA). "Discharging directly to" includes flow that is conveyed overland a distance of 200 feet or less from the project to the ESA, or conveyed in a pipe or open channel any distance as an isolated flow from the project to the ESA (i.e. not commingled with flows from adjacent lands). ❑ Yes ❑ No

8. **New development or redevelopment projects of a retail gasoline outlet (RGO) that create and/or replaces 5,000 square feet of impervious surface.** The development project meets the following criteria: (a) 5,000 square feet or more or (b) has a projected Average Daily Traffic (ADT) of 100 or more vehicles per day. ❑ Yes ❑ No

9. **New development or redevelopment projects of an automotive repair shops that creates and/or replaces 5,000 square feet or more of impervious surfaces.** Development projects categorized in any one of Standard Industrial Classification (SIC) codes 5013, 5014, 5541, 7532-7534, or 7536-7539. ❑ Yes ❑ No

10. **Other Pollutant Generating Project.** The project is not covered in the categories above, results in the disturbance of one or more acres of land and is expected to generate pollutants post construction, such as fertilizers and pesticides. This does not include projects creating less than 5,000 sf of impervious surface and where added landscaping does not require regular use of pesticides and fertilizers, such as slope stabilization using native plants. Calculation of the square footage of impervious surface need not include linear pathways that are for infrequent vehicle use, such as emergency maintenance access or bicycle pedestrian use, if they are built with pervious surfaces of if they sheet flow to surrounding pervious surfaces. ❑ Yes ❑ No

PART F: Select the appropriate category based on the outcomes of PART C through PART E.

1. The project is **NOT SUBJECT TO STORM WATER REQUIREMENTS**. ❑

2. The project is a **STANDARD DEVELOPMENT PROJECT**. Site design and source control BMP requirements apply. See the Storm Water Standards Manual for guidance. ❑

3. The project is **PDP EXEMPT**. Site design and source control BMP requirements apply. See the Storm Water Standards Manual for guidance. ❑

4. The project is a **PRIORITY DEVELOPMENT PROJECT**. Site design, source control, and structural pollutant control BMP requirements apply. See the Storm Water Standards Manual for guidance on determining if project requires a hydromodification plan management ❑

Name of Owner or Agent *(Please Print):* Title:

Signature: Date:

2010 California 303(d) List of Water Quality Limited Segments*

Water quality limited segments requiring a TMDL(5A), being addressed by TMDL(5B), and/or being addressed by an action other than TMDL(5C).

REGION	REGION NAME	WATER BODY NAME	WBID	WATER BODY TYPE	WBTYPE CODE	INTEGRATED REPORT CATEGORY	USGS CATALOGING UNIT*	CALWATER WATERSHED	ESTIMATED SIZE AFFECTED	UNIT	POLLUTANT	POLLUTANT CATEGORY	FINAL LISTING DECISION	TMDL REQUIREMENT STATUS**	EXPECTED TMDL COMPLETION DATE***	EXPECTED ATTAINMENT DATE***	USEPA TMDL APPROVED DATE***	COMMENTS INCLUDED ON 303(d) LIST
9	Regional Board 9 - San Diego Region	Agua Hedionda Creek	CAR904310002001092414505 1	River & Stream	R	5	18070303	90431000	7.0	Miles	Enterococcus	Pathogens	List on 303(d) list (TMDL required list)	5A	2019			
9	Regional Board 9 - San Diego Region	Agua Hedionda Creek	CAR904310002001092414505 1	River & Stream	R	5	18070303	90431000	7.0	Miles	Fecal Coliform	Pathogens	List on 303(d) list (TMDL required list)	5A	2019			
9	Regional Board 9 - San Diego Region	Agua Hedionda Creek	CAR904310002001092414505 1	River & Stream	R	5	18070303	90431000	7.0	Miles	Manganese	Metals/Metalloids	List on 303(d) list (TMDL required list)	5A	2019			
9	Regional Board 9 - San Diego Region	Agua Hedionda Creek	CAR904310002001092414505 1	River & Stream	R	5	18070303	90431000	7.0	Miles	Phosphorus	Nutrients	List on 303(d) list (TMDL required list)	5A	2019			
9	Regional Board 9 - San Diego Region	Agua Hedionda Creek	CAR904310002001092414505 1	River & Stream	R	5	18070303	90431000	7.0	Miles	Selenium	Metals/Metalloids	List on 303(d) list (TMDL required list)	5A	2019			
9	Regional Board 9 - San Diego Region	Agua Hedionda Creek	CAR904310002001092414505 1	River & Stream	R	5	18070303	90431000	7.0	Miles	Total Dissolved Solids	Salinity	Do Not Delist from 303(d) list (TMDL required list)	5A	2019			
9	Regional Board 9 - San Diego Region	Agua Hedionda Creek	CAR904310002001092414505 1	River & Stream	R	5	18070303	90431000	7.0	Miles	Total Nitrogen as N	Nutrients	List on 303(d) list (TMDL required list)	5A	2019			
9	Regional Board 9 - San Diego Region	Agua Hedionda Creek	CAR904310002001092414505 1	River & Stream	R	5	18070303	90431000	7.0	Miles	Toxicity	Toxicity	List on 303(d) list (TMDL required list)	5A	2019			
9	Regional Board 9 - San Diego Region	Aliso Creek	CAR901130001999020809313 0	River & Stream	R	5	18070301	90113000	19	Miles	Indicator Bacteria	Pathogens	List on 303(d) list (TMDL required list)	5A	2005			This listing for indicator bacteria applies to the Aliso Creek mainstem and all the major tributaries of Aliso Creek which are Sulphur Creek, Wood Canyon, Aliso Hills Canyon, Dairy Fork, and English Canyon.
9	Regional Board 9 - San Diego Region	Aliso Creek	CAR901130001999020809313 0	River & Stream	R	5	18070301	90113000	19	Miles	Phosphorus	Nutrients	Do Not Delist from 303(d) list (TMDL required list)	5A	2019			This listing for phosphorus applies to the Aliso Creek mainstem and all the major tributaries of Aliso Creek which are Sulphur Creek, Wood Canyon, Aliso Hills Canyon, Dairy Fork, and English Canyon.
9	Regional Board 9 - San Diego Region	Aliso Creek	CAR901130001999020809313 0	River & Stream	R	5	18070301	90113000	19	Miles	Selenium	Metals/Metalloids	List on 303(d) list (TMDL required list)	5A	2021			
9	Regional Board 9 - San Diego Region	Aliso Creek	CAR901130001999020809313 0	River & Stream	R	5	18070301	90113000	19	Miles	Total Nitrogen as N	Nutrients	List on 303(d) list (TMDL required list)	5A	2019			
9	Regional Board 9 - San Diego Region	Aliso Creek	CAR901130001999020809313 0	River & Stream	R	5	18070301	90113000	19	Miles	Toxicity	Toxicity	List on 303(d) list (TMDL required list)	5A	2019			This listing for toxicity applies to the Aliso Creek mainstem and all the major tributaries of Aliso Creek which are Sulphur Creek, Wood Canyon, Aliso Hills Canyon, Dairy Fork, and English Canyon.
9	Regional Board 9 - San Diego Region	Aliso Creek (mouth)	CAE901130001999020809594 5	Estuary	E	5	18070301	90113000	0.29	Acres	Indicator Bacteria	Pathogens	List on 303(d) list (TMDL required list)	5A	2019			
9	Regional Board 9 - San Diego Region	Alvarado Creek	CAR907110002001102512551 4	River & Stream	R	5	18070304	90711000	5.1	Miles	Selenium	Metals/Metalloids	List on 303(d) list (TMDL required list)	5A	2021			
9	Regional Board 9 - San Diego Region	Arroyo Trabuco Creek	CAR901200002001102510360 3	River & Stream	R	5	18070202	90120000	23	Miles	Diazinon	Pesticides	List on 303(d) list (TMDL required list)	5A	2019			
9	Regional Board 9 - San Diego Region	Arroyo Trabuco Creek	CAR901200002001102510360 3	River & Stream	R	5	18070202	90120000	23	Miles	Phosphorus	Nutrients	List on 303(d) list (TMDL required list)	5A	2019			
9	Regional Board 9 - San Diego Region	Arroyo Trabuco Creek	CAR901200002001102510360 3	River & Stream	R	5	18070202	90120000	23	Miles	Total Nitrogen as N	Nutrients	List on 303(d) list (TMDL required list)	5A	2019			
9	Regional Board 9 - San Diego Region	Arroyo Trabuco Creek	CAR901200002001102510360 3	River & Stream	R	5	18070202	90120000	23	Miles	Toxicity	Toxicity	List on 303(d) list (TMDL required list)	5A	2019			
9	Regional Board 9 - San Diego Region	Barrett Lake	CAL911300001998080310154 0	Lake & Reservoir	L	5	18070305	91130000	125	Acres	Color	Nuisance	List on 303(d) list (TMDL required list)	5A	2019			
9	Regional Board 9 - San Diego Region	Barrett Lake	CAL911300001998080310154 0	Lake & Reservoir	L	5	18070305	91130000	125	Acres	Manganese	Metals/Metalloids	List on 303(d) list (TMDL required list)	5A	2019			
9	Regional Board 9 - San Diego Region	Barrett Lake	CAL911300001998080310154 0	Lake & Reservoir	L	5	18070305	91130000	125	Acres	Perchlorate	Other Organics	List on 303(d) list (TMDL required list)	5A	2019			
9	Regional Board 9 - San Diego Region	Barrett Lake	CAL911300001998080310154 0	Lake & Reservoir	L	5	18070305	91130000	125	Acres	Total Nitrogen as N	Nutrients	List on 303(d) list (TMDL required list)	5A	2019			
9	Regional Board 9 - San Diego Region	Barrett Lake	CAL911300001998080310154 0	Lake & Reservoir	L	5	18070305	91130000	125	Acres	pH	Miscellaneous	List on 303(d) list (TMDL required list)	5A	2019			
9	Regional Board 9 - San Diego Region	Buena Creek	CAR904320002005063138 20	River & Stream	R	5	18070303	90432000	4.8	Miles	DDT (Dichlorodiphenyltrichloroethane)	Pesticides	List on 303(d) list (TMDL required list)	5A	2019			
9	Regional Board 9 - San Diego Region	Buena Creek	CAR904320002005063138 20	River & Stream	R	5	18070303	90432000	4.8	Miles	Nitrate and Nitrite	Nutrients	List on 303(d) list (TMDL required list)	5A	2019			
9	Regional Board 9 - San Diego Region	Buena Vista Creek	CAR904210002001102510312 3	River & Stream	R	5	18070303	90421000	11	Miles	Sediment Toxicity	Toxicity	Do Not Delist from 303(d) list (TMDL required list)	5A	2019			
9	Regional Board 9 - San Diego Region	Buena Vista Creek	CAR904210002001102510312 3	River & Stream	R	5	18070303	90421000	11	Miles	Selenium	Metals/Metalloids	List on 303(d) list (TMDL required list)	5A	2019			
9	Regional Board 9 - San Diego Region	Buena Vista Lagoon	CAE904210001999020909004 5	Estuary	E	5	18070303	90421000	202	Acres	Indicator Bacteria	Pathogens	List on 303(d) list (TMDL required list)	5A	2008			
9	Regional Board 9 - San Diego Region	Buena Vista Lagoon	CAE904210001999020909004 5	Estuary	E	5	18070303	90421000	202	Acres	Nutrients	Nutrients	List on 303(d) list (TMDL required list)	5A	2019			Estimated size of impairment is 150 acres located in upper portion of lagoon.
9	Regional Board 9 - San Diego Region	Buena Vista Lagoon	CAE904210001999020909004 5	Estuary	E	5	18070303	90421000	202	Acres	Sedimentation/Siltation	Sediment	List on 303(d) list (TMDL required list)	5A	2019			
9	Regional Board 9 - San Diego Region	Chollas Creek	CAR908220001999020814072 5	River & Stream	R	5	18070304	90822000	3.5	Miles	Copper	Metals/Metalloids	List on 303(d) list (TMDL required list)	5A	2004			
9	Regional Board 9 - San Diego Region	Chollas Creek	CAR908220001999020814072 5	River & Stream	R	5	18070304	90822000	3.5	Miles	Diazinon	Pesticides	Do Not Delist from 303(d) list (being addressed with USEPA approved TMDL)	5B			11/3/2003	
9	Regional Board 9 - San Diego Region	Chollas Creek	CAR908220001999020814072 5	River & Stream	R	5	18070304	90822000	3.5	Miles	Indicator Bacteria	Pathogens	List on 303(d) list (TMDL required list)	5A	2005			
9	Regional Board 9 - San Diego Region	Chollas Creek	CAR908220001999020814072 5	River & Stream	R	5	18070304	90822000	3.5	Miles	Lead	Metals/Metalloids	List on 303(d) list (TMDL required list)	5A	2004			
9	Regional Board 9 - San Diego Region	Chollas Creek	CAR908220001999020814072 5	River & Stream	R	5	18070304	90822000	3.5	Miles	Phosphorus	Nutrients	List on 303(d) list (TMDL required list)	5A	2019			
9	Regional Board 9 - San Diego Region	Chollas Creek	CAR908220001999020814072 5	River & Stream	R	5	18070304	90822000	3.5	Miles	Total Nitrogen as N	Nutrients	List on 303(d) list (TMDL required list)	5A	2019			
9	Regional Board 9 - San Diego Region	Chollas Creek	CAR908220001999020814072 5	River & Stream	R	5	18070304	90822000	3.5	Miles	Trash	Trash	List on 303(d) list (TMDL required list)	5A	2021			
9	Regional Board 9 - San Diego Region	Chollas Creek	CAR908220001999020814072 5	River & Stream	R	5	18070304	90822000	3.5	Miles	Zinc	Metals/Metalloids	List on 303(d) list (TMDL required list)	5A	2004			
9	Regional Board 9 - San Diego Region	Cloverdale Creek	CAR905320002001092611275 8	River & Stream	R	5	18070304	90532000	1.2	Miles	Phosphorus	Nutrients	List on 303(d) list (TMDL required list)	5A	2019			
9	Regional Board 9 - San Diego Region	Cloverdale Creek	CAR905320002001092611275 8	River & Stream	R	5	18070304	90532000	1.2	Miles	Total Dissolved Solids	Salinity	Do Not Delist from 303(d) list (TMDL required list)	5A	2019			
9	Regional Board 9 - San Diego Region	Cottonwood Creek (San Marcos Creek watershed)	CAR904510002001100914224 8	River & Stream	R	5	18070303	90451000	1.9	Miles	DDT (Dichlorodiphenyltrichloroethane)	Pesticides	List on 303(d) list (TMDL required list)	5A	2019			
9	Regional Board 9 - San Diego Region	Cottonwood Creek (San Marcos Creek watershed)	CAR904510002001100914224 8	River & Stream	R	5	18070303	90451000	1.9	Miles	Sediment Toxicity	Toxicity	Do Not Delist from 303(d) list (TMDL required list)	5A	2019			
9	Regional Board 9 - San Diego Region	Cottonwood Creek (San Marcos Creek watershed)	CAR904510002001100914224 8	River & Stream	R	5	18070303	90451000	1.9	Miles	Selenium	Metals/Metalloids	List on 303(d) list (TMDL required list)	5A	2019			
9	Regional Board 9 - San Diego Region	Cottonwood Creek (Tijuana River watershed)	CAR911600002002030614354 5	River & Stream	R	5	18070305	91160000	53	Miles	Selenium	Metals/Metalloids	List on 303(d) list (TMDL required list)	5A	2019			
9	Regional Board 9 - San Diego Region	Dana Point Harbor	CAB901140002001083114160 0	Bay & Harbor	B	5	18070301	90114000	119	Acres	Copper	Metals/Metalloids	List on 303(d) list (TMDL required list)	5A	2019			
9	Regional Board 9 - San Diego Region	Dana Point Harbor	CAB901140002001083114160 0	Bay & Harbor	B	5	18070301	90114000	119	Acres	Toxicity	Toxicity	List on 303(d) list (TMDL required list)	5A	2021			
9	Regional Board 9 - San Diego Region	Dana Point Harbor	CAB901140002001083114160 0	Bay & Harbor	B	5	18070301	90114000	119	Acres	Zinc	Metals/Metalloids	List on 303(d) list (TMDL required list)	5A	2019			
9	Regional Board 9 - San Diego Region	De Luz Creek	CAR902210002001092413544 2	River & Stream	R	5	18070302	90221000	14	Miles	Iron	Metals/Metalloids	List on 303(d) list (TMDL required list)	5A	2019			
9	Regional Board 9 - San Diego Region	De Luz Creek	CAR902210002001092413544 2	River & Stream	R	5	18070302	90221000	14	Miles	Manganese	Metals/Metalloids	List on 303(d) list (TMDL required list)	5A	2019			
9	Regional Board 9 - San Diego Region	De Luz Creek	CAR902210002001092413544 2	River & Stream	R	5	18070302	90221000	14	Miles	Nitrogen	Nutrients	List on 303(d) list (TMDL required list)	5A	2021			
9	Regional Board 9 - San Diego Region	De Luz Creek	CAR902210002001092413544 2	River & Stream	R	5	18070302	90221000	14	Miles	Sulfates	Other Inorganics	List on 303(d) list (TMDL required list)	5A	2019			
9	Regional Board 9 - San Diego Region	El Capitan Lake	CAL907310002001102509321 1	Lake & Reservoir	L	5	18070304	90731000	1454	Acres	Color	Nuisance	List on 303(d) list (TMDL required list)	5A	2019			
9	Regional Board 9 - San Diego Region	El Capitan Lake	CAL907310002001102509321 1	Lake & Reservoir	L	5	18070304	90731000	1454	Acres	Manganese	Metals/Metalloids	List on 303(d) list (TMDL required list)	5A	2019			
9	Regional Board 9 - San Diego Region	El Capitan Lake	CAL907310002001102509321 1	Lake & Reservoir	L	5	18070304	90731000	1454	Acres	Phosphorus	Nutrients	List on 303(d) list (TMDL required list)	5A	2021			
9	Regional Board 9 - San Diego Region	El Capitan Lake	CAL907310002001102509321 1	Lake & Reservoir	L	5	18070304	90731000	1454	Acres	Total Nitrogen as N	Nutrients	List on 303(d) list (TMDL required list)	5A	2021			
9	Regional Board 9 - San Diego Region	El Capitan Lake	CAL907310002001102509321 1	Lake & Reservoir	L	5	18070304	90731000	1454	Acres	pH	Miscellaneous	List on 303(d) list (TMDL required list)	5A	2019			
9	Regional Board 9 - San Diego Region	Encinitas Creek	CAR904510001999111714759	River & Stream	R	5	18070303	90451000	3.0	Miles	Selenium	Metals/Metalloids	List on 303(d) list (TMDL required list)	5A	2019			
9	Regional Board 9 - San Diego Region	Encinitas Creek	CAR904510001999111714759	River & Stream	R	5	18070303	90451000	3.0	Miles	Toxicity	Toxicity	List on 303(d) list (TMDL required list)	5A	2019			
9	Regional Board 9 - San Diego Region	English Canyon	CAR901130002005060220395 3	River & Stream	R	5	18070301	90113000	3.6	Miles	Benzo[b]fluoranthene	Other Organics	List on 303(d) list (TMDL required list)	5A	2019			
9	Regional Board 9 - San Diego Region	English Canyon	CAR901130002005060220395 3	River & Stream	R	5	18070301	90113000	3.6	Miles	Dieldrin	Pesticides	List on 303(d) list (TMDL required list)	5A	2019			
9	Regional Board 9 - San Diego Region	English Canyon	CAR901130002005060220395 3	River & Stream	R	5	18070301	90113000	3.6	Miles	Sediment Toxicity	Toxicity	Do Not Delist from 303(d) list (TMDL required list)	5A	2019			
9	Regional Board 9 - San Diego Region	English Canyon	CAR901130002005060220395 3	River & Stream	R	5	18070301	90113000	3.6	Miles	Selenium	Metals/Metalloids	List on 303(d) list (TMDL required list)	5A	2019			
9	Regional Board 9 - San Diego Region	Escondido Creek	CAR904620002001110051345 2	River & Stream	R	5	18070303	90462000	26	Miles	DDT (Dichlorodiphenyltrichloroethane)	Pesticides	List on 303(d) list (TMDL required list)	5A	2019			
9	Regional Board 9 - San Diego Region	Escondido Creek	CAR904620002001110051345 2	River & Stream	R	5	18070303	90462000	26	Miles	Enterococcus	Pathogens	List on 303(d) list (TMDL required list)	5A	2019			
9	Regional Board 9 - San Diego Region	Escondido Creek	CAR904620002001110051345 2	River & Stream	R	5	18070303	90462000	26	Miles	Fecal Coliform	Pathogens	List on 303(d) list (TMDL required list)	5A	2019			
9	Regional Board 9 - San Diego Region	Escondido Creek	CAR904620002001110051345 2	River & Stream	R	5	18070303	90462000	26	Miles	Manganese	Metals/Metalloids	Do Not Delist from 303(d) list (TMDL required list)	5A	2019			
9	Regional Board 9 - San Diego Region	Escondido Creek	CAR904620002001110051345 2	River & Stream	R	5	18070303	90462000	26	Miles	Phosphate	Nutrients	Do Not Delist from 303(d) list (TMDL required list)	5A	2019			
9	Regional Board 9 - San Diego Region	Escondido Creek	CAR904620002001110051345 2	River & Stream	R	5	18070303	90462000	26	Miles	Selenium	Metals/Metalloids	List on 303(d) list (TMDL required list)	5A	2019			
9	Regional Board 9 - San Diego Region	Escondido Creek	CAR904620002001110051345 2	River & Stream	R	5	18070303	90462000	26	Miles	Sulfates	Other Inorganics	List on 303(d) list (TMDL required list)	5A	2019			
9	Regional Board 9 - San Diego Region	Escondido Creek	CAR904620002001110051345 2	River & Stream	R	5	18070303	90462000	26	Miles	Total Dissolved Solids	Salinity	Do Not Delist from 303(d) list (TMDL required list)	5A	2019			
9	Regional Board 9 - San Diego Region	Escondido Creek	CAR904620002001110051345 2	River & Stream	R	5	18070303	90462000	26	Miles	Total Nitrogen as N	Nutrients	List on 303(d) list (TMDL required list)	5A	2019			
9	Regional Board 9 - San Diego Region	Escondido Creek	CAR904620002001110051345 2	River & Stream	R	5	18070303	90462000	26	Miles	Toxicity	Toxicity	List on 303(d) list (TMDL required list)	5A	2019			
9	Regional Board 9 - San Diego Region	Famosa Slough and Channel	CAE907110001999020912234 0	Estuary	E	5	18070304	90711000	32	Acres	Eutrophic	Nutrients	List on 303(d) list (TMDL required list)	5A	2019			
9	Regional Board 9 - San Diego Region	Felicita Creek	CAR905230002001092513104 9	River & Stream	R	5	18070304	90523000	0.9	Miles	Aluminum	Metals/Metalloids	List on 303(d) list (TMDL required list)	5A	2019			
9	Regional Board 9 - San Diego Region	Felicita Creek	CAR905230002001092513104 9	River & Stream	R	5	18070304	90523000	0.9	Miles	Total Dissolved Solids	Salinity	Do Not Delist from 303(d) list (TMDL required list)	5A	2019			
9	Regional Board 9 - San Diego Region	Forester Creek	CAR907130002001092412024 0	River & Stream	R	5	18070304	90712000	6.4	Miles	Fecal Coliform	Pathogens	List on 303(d) list (TMDL required list)	5A	2005			Impairment Located at lower 1 mile.
9	Regional Board 9 - San Diego Region	Forester Creek	CAR907130002001092412024 0	River & Stream	R	5	18070304	90712000	6.4	Miles	Selenium	Metals/Metalloids	List on 303(d) list (TMDL required list)	5A	2019			
9	Regional Board 9 - San Diego Region	Forester Creek	CAR907130002001092412024 0	River & Stream	R	5	18070304	90712000	6.4	Miles	Total Dissolved Solids	Salinity	Do Not Delist from 303(d) list (TMDL required list)	5A	2019			Impairment Located at lower 1 mile.
9	Regional Board 9 - San Diego Region	Forester Creek	CAR907130002001092412024 0	River & Stream	R	5	18070304	90712000	6.4	Miles	pH	Miscellaneous	Do Not Delist from 303(d) list (TMDL required list)	5A	2019			Impairment Located at upper 3 miles.
9	Regional Board 9 - San Diego Region	Green Valley Creek	CAR905220002001092613074 5	River & Stream	R	5	18070304	90521000	1.0	Miles	Chloride	Salinity	List on 303(d) list (TMDL required list)	5A	2019			
9	Regional Board 9 - San Diego Region	Green Valley Creek	CAR905220002001092613074 5	River & Stream	R	5	18070304	90521000	1.0	Miles	Manganese	Metals/Metalloids	List on 303(d) list (TMDL required list)	5A	2019			
9	Regional Board 9 - San Diego Region	Green Valley Creek	CAR905220002001092613074 5	River & Stream	R	5	18070304	90521000	1.0	Miles	Pentachlorophenol (PCP)	Other Organics	List on 303(d) list (TMDL required list)	5A	2019			
9	Regional Board 9 - San Diego Region	Green Valley Creek	CAR905220002001092613074 5	River & Stream	R	5	18070304	90521000	1.0	Miles	Sulfates	Other Inorganics	Do Not Delist from 303(d) list (TMDL required list)	5A	2019			
9	Regional Board 9 - San Diego Region	Guajome Lake	CAL903110001999020814214 5	Lake & Reservoir	L	5	18070303	90311000	33	Acres	Eutrophic	Nutrients	List on 303(d) list (TMDL required list)	5A	2019			
9	Regional Board 9 - San Diego Region	Hodges, Lake	CAL905210002001092509490 6	Lake & Reservoir	L	5	18070304	90521000	1104	Acres	Color	Nuisance	Do Not Delist from 303(d) list (TMDL required list)	5A	2019			
9	Regional Board 9 - San Diego Region	Hodges, Lake	CAL905210002001092509490 6	Lake & Reservoir	L	5	18070304	90521000	1104	Acres	Manganese	Metals/Metalloids	List on 303(d) list (TMDL required list)	5A	2019			
9	Regional Board 9 - San Diego Region	Hodges, Lake	CAL905210002001092509490 6	Lake & Reservoir	L	5	18070304	90521000	1104	Acres	Mercury	Metals/Metalloids	List on 303(d) list (TMDL required list)	5A	2021			
9	Regional Board 9 - San Diego Region	Hodges, Lake	CAL905210002001092509490 6	Lake & Reservoir	L	5	18070304	90521000	1104	Acres	Nitrogen	Nutrients	Do Not Delist from 303(d) list (TMDL required list)	5A	2019			
9	Regional Board 9 - San Diego Region	Hodges, Lake	CAL905210002001092509490 6	Lake & Reservoir	L	5	18070304	90521000	1104	Acres	Phosphorus	Nutrients	Do Not Delist from 303(d) list (TMDL required list)	5A	2013			
9	Regional Board 9 - San Diego Region	Hodges, Lake	CAL905210002001092509490 6	Lake & Reservoir	L	5	18070304	90521000	1104	Acres	Turbidity	Sediment	List on 303(d) list (TMDL required list)	5A	2019			
9	Regional Board 9 - San Diego Region	Hodges, Lake	CAL905210002001092509490 6	Lake & Reservoir	L	5	18070304	90521000	1104	Acres	pH	Miscellaneous	List on 303(d) list (TMDL required list)	5A	2019			
9	Regional Board 9 - San Diego Region	Jamul Creek	CAR910330002008103115383 2	River & Stream	R	5	18070304	91033000	10	Miles	Toxicity	Toxicity	List on 303(d) list (TMDL required list)	5A	2019			

2010 California 303(d) List of Water Quality Limited Segments*

Water quality limited segments requiring a TMDL(5A), being addressed by TMDL(5B), and/or being addressed by an action other than TMDL(5C).

REGION	REGION NAME	WATER BODY NAME	WBID	WATER BODY TYPE	WBTYPE CODE	INTEGRATED REPORT CATEGORY	USGS CATALOGING UNIT*	CALWATER WATERSHED	ESTIMATED SIZE AFFECTED	UNIT	POLLUTANT	POLLUTANT CATEGORY	FINAL LISTING DECISION	TMDL REQUIREMENT STATUS**	EXPECTED TMDL COMPLETION DATE***	EXPECTED ATTAINMENT DATE***	USEPA TMDL APPROVED DATE***	COMMENTS INCLUDED ON 303(d) LIST
9	Regional Board 9 - San Diego Region	Keys Creek	CAR903120002008120153438	River & Stream	R	5	18070303	90312000	13	Miles	Selenium	Metals/Metalloids	List on 303(d) list (TMDL required list)	5A	2019			
9	Regional Board 9 - San Diego Region	Kit Carson Creek	CAR905210002001092613282 4	River & Stream	R	5	18070304	90521000	1.0	Miles	Pentachlorophenol (PCP)	Other Organics	List on 303(d) list (TMDL required list)	5A	2019			
9	Regional Board 9 - San Diego Region	Kit Carson Creek	CAR905210002001092613282 4	River & Stream	R	5	18070304	90521000	1.0	Miles	Total Dissolved Solids	Salinity	Do Not Delist from 303(d) list (TMDL required list)	5A	2019			
9	Regional Board 9 - San Diego Region	Laguna Canyon Channel	CAR901120002001102510502 9	River & Stream	R	5	18070301	90112000	1.6	Miles	Sediment Toxicity	Toxicity	Do Not Delist from 303(d) list (TMDL required list)	5A	2019			
9	Regional Board 9 - San Diego Region	Laguna Canyon Channel	CAR901120002001102510502 9	River & Stream	R	5	18070301	90112000	1.6	Miles	Toxicity	Toxicity	List on 303(d) list (TMDL required list)	5A	2019			
9	Regional Board 9 - San Diego Region	Loma Alta Creek	CAR904100001999111714530 0	River & Stream	R	5	18070303	90410000	7.8	Miles	Selenium	Metals/Metalloids	List on 303(d) list (TMDL required list)	5A	2019			
9	Regional Board 9 - San Diego Region	Loma Alta Creek	CAR904100001999111714530 0	River & Stream	R	5	18070303	90410000	7.8	Miles	Toxicity	Toxicity	List on 303(d) list (TMDL required list)	5A	2019			
9	Regional Board 9 - San Diego Region	Loma Alta Slough	CAE904100001999111715052 0	Estuary	E	5	18070303	90410000	8.2	Acres	Eutrophic	Nutrients	List on 303(d) list (TMDL required list)	5A	2015			
9	Regional Board 9 - San Diego Region	Loma Alta Slough	CAE904100001999111715052 0	Estuary	E	5	18070303	90410000	8.2	Acres	Indicator Bacteria	Pathogens	List on 303(d) list (TMDL required list)	5A	2015			
9	Regional Board 9 - San Diego Region	Long Canyon Creek (tributary to Murrieta Creek)	CAR902830002001102511250 9	River & Stream	R	5	18070302	90232000	8.3	Miles	Chlorpyrifos	Pesticides	List on 303(d) list (TMDL required list)	5A	2019			
9	Regional Board 9 - San Diego Region	Long Canyon Creek (tributary to Murrieta Creek)	CAR902830002001102511250 9	River & Stream	R	5	18070302	90232000	8.3	Miles	Fecal Coliform	Pathogens	List on 303(d) list (TMDL required list)	5A	2019			
9	Regional Board 9 - San Diego Region	Long Canyon Creek (tributary to Murrieta Creek)	CAR902830002001102511250 9	River & Stream	R	5	18070302	90232000	8.3	Miles	Iron	Metals/Metalloids	List on 303(d) list (TMDL required list)	5A	2019			
9	Regional Board 9 - San Diego Region	Long Canyon Creek (tributary to Murrieta Creek)	CAR902830002001102511250 9	River & Stream	R	5	18070302	90232000	8.3	Miles	Manganese	Metals/Metalloids	List on 303(d) list (TMDL required list)	5A	2019			
9	Regional Board 9 - San Diego Region	Los Coches Creek	CAR907140002008121015514 4	River & Stream	R	5	18070304	90714000	8.8	Miles	Selenium	Metals/Metalloids	List on 303(d) list (TMDL required list)	5A	2019			
9	Regional Board 9 - San Diego Region	Los Penasquitos Creek	CAR906100002001102511282 6	River & Stream	R	5	18070304	90610000	12	Miles	Enterococcus	Pathogens	List on 303(d) list (TMDL required list)	5A	2019			
9	Regional Board 9 - San Diego Region	Los Penasquitos Creek	CAR906100002001102511282 6	River & Stream	R	5	18070304	90610000	12	Miles	Fecal Coliform	Pathogens	List on 303(d) list (TMDL required list)	5A	2019			
9	Regional Board 9 - San Diego Region	Los Penasquitos Creek	CAR906100002001102511282 6	River & Stream	R	5	18070304	90610000	12	Miles	Selenium	Metals/Metalloids	List on 303(d) list (TMDL required list)	5A	2019			
9	Regional Board 9 - San Diego Region	Los Penasquitos Creek	CAR906100002001102511282 6	River & Stream	R	5	18070304	90610000	12	Miles	Total Dissolved Solids	Salinity	List on 303(d) list (TMDL required list)	5A	2019			
9	Regional Board 9 - San Diego Region	Los Penasquitos Creek	CAR906100002001102511282 6	River & Stream	R	5	18070304	90610000	12	Miles	Total Nitrogen as N	Nutrients	List on 303(d) list (TMDL required list)	5A	2019			
9	Regional Board 9 - San Diego Region	Los Penasquitos Creek	CAR906100002001102511282 6	River & Stream	R	5	18070304	90610000	12	Miles	Toxicity	Toxicity	List on 303(d) list (TMDL required list)	5A	2021			
9	Regional Board 9 - San Diego Region	Los Penasquitos Lagoon	CAE906100001999020951261 0	Estuary	E	5	18070304	90610000	469	Acres	Sedimentation/Siltation	Sediment	List on 303(d) list (TMDL required list)	5A	2019			
9	Regional Board 9 - San Diego Region	Loveland Reservoir	CAL909310002001102509360 6	Lake & Reservoir	L	5	18070304	90931000	420	Acres	Aluminum	Metals/Metalloids	List on 303(d) list (TMDL required list)	5A	2019			
9	Regional Board 9 - San Diego Region	Loveland Reservoir	CAL909310002001102509360 6	Lake & Reservoir	L	5	18070304	90931000	420	Acres	Manganese	Metals/Metalloids	List on 303(d) list (TMDL required list)	5A	2019			
9	Regional Board 9 - San Diego Region	Loveland Reservoir	CAL909310002001102509360 6	Lake & Reservoir	L	5	18070304	90931000	420	Acres	Oxygen, Dissolved	Nutrients	List on 303(d) list (TMDL required list)	5A	2019			
9	Regional Board 9 - San Diego Region	Loveland Reservoir	CAL909310002001102509360 6	Lake & Reservoir	L	5	18070304	90931000	420	Acres	pH	Miscellaneous	List on 303(d) list (TMDL required list)	5A	2019			This listing was made by USEPA for 2006.
9	Regional Board 9 - San Diego Region	Miramar Reservoir	CAL906100002001100541251 4	Lake & Reservoir	L	5	18070304	90610000	138	Acres	Total Nitrogen as N	Nutrients	List on 303(d) list (TMDL required list)	5A	2019			
9	Regional Board 9 - San Diego Region	Mission Bay (area at mouth of Rose Creek only)	CAB906400002005010418565 9	Bay & Harbor	B	5	18070304	90640000	9.2	Acres	Eutrophic	Nutrients	List on 303(d) list (TMDL required list)	5A	2019			
9	Regional Board 9 - San Diego Region	Mission Bay (area at mouth of Rose Creek only)	CAB906400002005010418565 9	Bay & Harbor	B	5	18070304	90640000	9.2	Acres	Lead	Metals/Metalloids	List on 303(d) list (TMDL required list)	5A	2019			
9	Regional Board 9 - San Diego Region	Mission Bay (area at mouth of Tecolote Creek only)	CAB906500002005010419065 1	Bay & Harbor	B	5	18070304	90650000	3.1	Acres	Eutrophic	Nutrients	Do Not Delist from 303(d) list (TMDL required list)	5A	2019			
9	Regional Board 9 - San Diego Region	Mission Bay (area at mouth of Tecolote Creek only)	CAB906500002005010419065 1	Bay & Harbor	B	5	18070304	90650000	3.1	Acres	Lead	Metals/Metalloids	Do Not Delist from 303(d) list (TMDL required list)	5A	2019			
9	Regional Board 9 - San Diego Region	Mission Bay Shoreline, at Bahia Point	CAC907510002009042220391 0	Coastal & Bay Shoreline	C	5	18070304	90751000	0.14	Miles	Enterococcus	Pathogens	Do Not Delist from 303(d) list (TMDL required list)	5A	2019			
9	Regional Board 9 - San Diego Region	Mission Bay Shoreline, at Bahia Point	CAC907510002009042220391 0	Coastal & Bay Shoreline	C	5	18070304	90751000	0.14	Miles	Fecal Coliform	Pathogens	Do Not Delist from 303(d) list (TMDL required list)	5A	2019			
9	Regional Board 9 - San Diego Region	Mission Bay Shoreline, at Bahia Point	CAC907510002009042220391 0	Coastal & Bay Shoreline	C	5	18070304	90751000	0.14	Miles	Total Coliform	Pathogens	Do Not Delist from 303(d) list (TMDL required list)	5A	2019			
9	Regional Board 9 - San Diego Region	Mission Bay Shoreline, at Bonita Cove	CAC907520002009042220212 7	Coastal & Bay Shoreline	C	5	18070304	90751000	0.09	Miles	Enterococcus	Pathogens	Do Not Delist from 303(d) list (TMDL required list)	5A	2019			
9	Regional Board 9 - San Diego Region	Mission Bay Shoreline, at Bonita Cove	CAC907520002009042220212 7	Coastal & Bay Shoreline	C	5	18070304	90751000	0.09	Miles	Fecal Coliform	Pathogens	Do Not Delist from 303(d) list (TMDL required list)	5A	2021			
9	Regional Board 9 - San Diego Region	Mission Bay Shoreline, at Bonita Cove	CAC907520002009042220212 7	Coastal & Bay Shoreline	C	5	18070304	90751000	0.09	Miles	Total Coliform	Pathogens	Do Not Delist from 303(d) list (TMDL required list)	5A	2019			
9	Regional Board 9 - San Diego Region	Mission Bay Shoreline, at Campland	CAC906400002009042220532 8	Coastal & Bay Shoreline	C	5	18070304	90640000	0.08	Miles	Enterococcus	Pathogens	Do Not Delist from 303(d) list (TMDL required list)	5A	2019			
9	Regional Board 9 - San Diego Region	Mission Bay Shoreline, at Campland	CAC906400002009042220532 8	Coastal & Bay Shoreline	C	5	18070304	90640000	0.08	Miles	Fecal Coliform	Pathogens	Do Not Delist from 303(d) list (TMDL required list)	5A	2019			
9	Regional Board 9 - San Diego Region	Mission Bay Shoreline, at Campland	CAC906400002009042220532 8	Coastal & Bay Shoreline	C	5	18070304	90640000	0.08	Miles	Total Coliform	Pathogens	Do Not Delist from 303(d) list (TMDL required list)	5A	2019			
9	Regional Board 9 - San Diego Region	Mission Bay Shoreline, at De Anza Cove	CAC906400002009042221061 2	Coastal & Bay Shoreline	C	5	18070304	90640000	0.06	Miles	Enterococcus	Pathogens	Do Not Delist from 303(d) list (TMDL required list)	5A	2019			
9	Regional Board 9 - San Diego Region	Mission Bay Shoreline, at De Anza Cove	CAC906400002009042221061 2	Coastal & Bay Shoreline	C	5	18070304	90640000	0.06	Miles	Fecal Coliform	Pathogens	Do Not Delist from 303(d) list (TMDL required list)	5A	2019			
9	Regional Board 9 - San Diego Region	Mission Bay Shoreline, at De Anza Cove	CAC906400002009042221061 2	Coastal & Bay Shoreline	C	5	18070304	90640000	0.06	Miles	Total Coliform	Pathogens	Do Not Delist from 303(d) list (TMDL required list)	5A	2019			
9	Regional Board 9 - San Diego Region	Mission Bay Shoreline, at Fanual Park	CAC907510002009042220483 6	Coastal & Bay Shoreline	C	5	18070304	90751000	0.12	Miles	Enterococcus	Pathogens	Do Not Delist from 303(d) list (TMDL required list)	5A	2021			
9	Regional Board 9 - San Diego Region	Mission Bay Shoreline, at Fanual Park	CAC907510002009042220483 6	Coastal & Bay Shoreline	C	5	18070304	90751000	0.12	Miles	Total Coliform	Pathogens	Do Not Delist from 303(d) list (TMDL required list)	5A	2019			
9	Regional Board 9 - San Diego Region	Mission Bay Shoreline, at Leisure Lagoon	CAC906400002009042221171 7	Coastal & Bay Shoreline	C	5	18070304	90640000	0.12	Miles	Enterococcus	Pathogens	Do Not Delist from 303(d) list (TMDL required list)	5A	2019			
9	Regional Board 9 - San Diego Region	Mission Bay Shoreline, at Leisure Lagoon	CAC906400002009042221171 7	Coastal & Bay Shoreline	C	5	18070304	90640000	0.12	Miles	Total Coliform	Pathogens	Do Not Delist from 303(d) list (TMDL required list)	5A	2019			
9	Regional Board 9 - San Diego Region	Mission Bay Shoreline, at North Crown Point	CAC906400002009042220592 1	Coastal & Bay Shoreline	C	5	18070304	90640000	0.12	Miles	Enterococcus	Pathogens	Do Not Delist from 303(d) list (TMDL required list)	5A	2019			
9	Regional Board 9 - San Diego Region	Mission Bay Shoreline, at North Crown Point	CAC906400002009042220592 1	Coastal & Bay Shoreline	C	5	18070304	90640000	0.12	Miles	Total Coliform	Pathogens	Do Not Delist from 303(d) list (TMDL required list)	5A	2019			
9	Regional Board 9 - San Diego Region	Mission Bay Shoreline, at Tecolote Shores	CAC906500002009042809202 5	Coastal & Bay Shoreline	C	5	18070304	90650000	0.04	Miles	Enterococcus	Pathogens	Do Not Delist from 303(d) list (TMDL required list)	5A	2019			
9	Regional Board 9 - San Diego Region	Mission Bay Shoreline, at Tecolote Shores	CAC906500002009042809202 5	Coastal & Bay Shoreline	C	5	18070304	90650000	0.04	Miles	Total Coliform	Pathogens	Do Not Delist from 303(d) list (TMDL required list)	5A	2019			
9	Regional Board 9 - San Diego Region	Mission Bay Shoreline, at Visitors Center	CAC906400002009042221130 9	Coastal & Bay Shoreline	C	5	18070304	90640000	0.10	Miles	Enterococcus	Pathogens	Do Not Delist from 303(d) list (TMDL required list)	5A	2019			
9	Regional Board 9 - San Diego Region	Mission Bay Shoreline, at Visitors Center	CAC906400002009042221130 9	Coastal & Bay Shoreline	C	5	18070304	90640000	0.10	Miles	Fecal Coliform	Pathogens	Do Not Delist from 303(d) list (TMDL required list)	5A	2019			
9	Regional Board 9 - San Diego Region	Mission Bay Shoreline, at Visitors Center	CAC906400002009042221130 9	Coastal & Bay Shoreline	C	5	18070304	90640000	0.10	Miles	Total Coliform	Pathogens	Do Not Delist from 303(d) list (TMDL required list)	5A	2019			
9	Regional Board 9 - San Diego Region	Mission Bay at Quivira Basin	CAB907520002009071233394 5	Bay & Harbor	B	5	18070304	90752000	65	Acres	Copper	Metals/Metalloids	List on 303(d) list (TMDL required list)	5A	2021			
9	Regional Board 9 - San Diego Region	Morena Reservoir	CAL911500002001102509281 1	Lake & Reservoir	L	5	18070305	91150000	104	Acres	Ammonia as Nitrogen	Nutrients	List on 303(d) list (TMDL required list)	5A	2019			
9	Regional Board 9 - San Diego Region	Morena Reservoir	CAL911500002001102509281 1	Lake & Reservoir	L	5	18070305	91150000	104	Acres	Color	Nuisance	List on 303(d) list (TMDL required list)	5A	2019			
9	Regional Board 9 - San Diego Region	Morena Reservoir	CAL911500002001102509281 1	Lake & Reservoir	L	5	18070305	91150000	104	Acres	Manganese	Metals/Metalloids	List on 303(d) list (TMDL required list)	5A	2019			
9	Regional Board 9 - San Diego Region	Morena Reservoir	CAL911500002001102509281 1	Lake & Reservoir	L	5	18070305	91150000	104	Acres	Phosphorus	Nutrients	List on 303(d) list (TMDL required list)	5A	2021			
9	Regional Board 9 - San Diego Region	Morena Reservoir	CAL911500002001102509281 1	Lake & Reservoir	L	5	18070305	91150000	104	Acres	pH	Miscellaneous	List on 303(d) list (TMDL required list)	5A	2019			
9	Regional Board 9 - San Diego Region	Moro Canyon Creek	CAR901110002008121015454 7	River & Stream	R	5	18070301	90111000	3.4	Miles	Selenium	Metals/Metalloids	List on 303(d) list (TMDL required list)	5A	2021			
9	Regional Board 9 - San Diego Region	Moro Canyon Creek	CAR901110002008121015454 7	River & Stream	R	5	18070301	90111000	3.4	Miles	Toxicity	Toxicity	List on 303(d) list (TMDL required list)	5A	2021			
9	Regional Board 9 - San Diego Region	Murray Reservoir	CAL907110002001100514285 8	Lake & Reservoir	L	5	18070304	90711000	119	Acres	Nitrogen	Nutrients	List on 303(d) list (TMDL required list)	5A	2021			
9	Regional Board 9 - San Diego Region	Murray Reservoir	CAL907110002001100514285 8	Lake & Reservoir	L	5	18070304	90711000	119	Acres	pH	Miscellaneous	List on 303(d) list (TMDL required list)	5A	2019			
9	Regional Board 9 - San Diego Region	Murrieta Creek	CAR902320002001092415213 6	River & Stream	R	5	18070302	90252000	12	Miles	Chlorpyrifos	Pesticides	List on 303(d) list (TMDL required list)	5A	2021			
9	Regional Board 9 - San Diego Region	Murrieta Creek	CAR902320002001092415213 6	River & Stream	R	5	18070302	90252000	12	Miles	Copper	Metals/Metalloids	List on 303(d) list (TMDL required list)	5A	2019			
9	Regional Board 9 - San Diego Region	Murrieta Creek	CAR902320002001092415213 6	River & Stream	R	5	18070302	90252000	12	Miles	Iron	Metals/Metalloids	List on 303(d) list (TMDL required list)	5A	2019			
9	Regional Board 9 - San Diego Region	Murrieta Creek	CAR902320002001092415213 6	River & Stream	R	5	18070302	90252000	12	Miles	Manganese	Metals/Metalloids	List on 303(d) list (TMDL required list)	5A	2019			
9	Regional Board 9 - San Diego Region	Murrieta Creek	CAR902320002001092415213 6	River & Stream	R	5	18070302	90252000	12	Miles	Nitrogen	Nutrients	List on 303(d) list (TMDL required list)	5A	2019			
9	Regional Board 9 - San Diego Region	Murrieta Creek	CAR902320002001092415213 6	River & Stream	R	5	18070302	90252000	12	Miles	Phosphorus	Nutrients	Do Not Delist from 303(d) list (TMDL required list)	5A	2019			
9	Regional Board 9 - San Diego Region	Murrieta Creek	CAR902320002001092415213 6	River & Stream	R	5	18070302	90252000	12	Miles	Toxicity	Toxicity	List on 303(d) list (TMDL required list)	5A	2021			
9	Regional Board 9 - San Diego Region	Oceanside Harbor	CAB902110001999111713053 1	Bay & Harbor	B	5	18070302	90211000	52	Acres	Copper	Metals/Metalloids	List on 303(d) list (TMDL required list)	5A	2021			
9	Regional Board 9 - San Diego Region	Oso Creek (at Mission Viejo Golf Course)	CAR901200002001083115070 8	River & Stream	R	5	18070301	90120000	1.0	Miles	Chloride	Salinity	List on 303(d) list (TMDL required list)	5A	2019			

2010 California 303(d) List of Water Quality Limited Segments*

Water quality limited segments requiring a TMDL(5A), being addressed by TMDL(5B), and/or being addressed by an action other than TMDL(5C).

REGION	REGION NAME	WATER BODY NAME	WBID	WATER BODY TYPE	WBTYPE CODE	INTEGRATED REPORT CATEGORY	USGS CATALOGING UNIT*	CALWATER WATERSHED	ESTIMATED SIZE AFFECTED	UNIT	POLLUTANT	POLLUTANT CATEGORY	FINAL LISTING DECISION	TMDL REQUIREMENT STATUS**	EXPECTED TMDL COMPLETION DATE***	EXPECTED ATTAINMENT DATE***	USEPA TMDL APPROVED DATE***	COMMENTS INCLUDED ON 303(d) LIST
9	Regional Board 9 - San Diego Region	Oso Creek (at Mission Viejo Golf Course)	CAR9012000020010831150708	River & Stream	R	5	18070301	90120000	1.0	Miles	Sulfates	Other Inorganics	List on 303(d) list (TMDL required list)	5A	2019			
9	Regional Board 9 - San Diego Region	Oso Creek (at Mission Viejo Golf Course)	CAR9012000020010831150708	River & Stream	R	5	18070301	90120000	1.0	Miles	Total Dissolved Solids	Salinity	List on 303(d) list (TMDL required list)	5A	2019			
9	Regional Board 9 - San Diego Region	Oso Creek (lower)	CAR9012000020010831154628	River & Stream	R	5	18070301	90120000	4.0	Miles	Selenium	Metals/Metalloids	List on 303(d) list (TMDL required list)	5A	2021			
9	Regional Board 9 - San Diego Region	Oso Creek (lower)	CAR9012000020010831154628	River & Stream	R	5	18070301	90120000	4.0	Miles	Toxicity	Toxicity	List on 303(d) list (TMDL required list)	5A	2021			
9	Regional Board 9 - San Diego Region	Otay Reservoir, Lower	CAL9103100019991117155943	Lake & Reservoir	L	5	18070304	91031000	1050	Acres	Ammonia	Nutrients	List on 303(d) list (TMDL required list)	5A	2019			
9	Regional Board 9 - San Diego Region	Otay Reservoir, Lower	CAL9103100019991117155943	Lake & Reservoir	L	5	18070304	91031000	1050	Acres	Color	Nuisance	Do Not Delist from 303(d) list (TMDL required list)	5A	2019			
9	Regional Board 9 - San Diego Region	Otay Reservoir, Lower	CAL9103100019991117155943	Lake & Reservoir	L	5	18070304	91031000	1050	Acres	Iron	Metals/Metalloids	List on 303(d) list (TMDL required list)	5A	2019			
9	Regional Board 9 - San Diego Region	Otay Reservoir, Lower	CAL9103100019991117155943	Lake & Reservoir	L	5	18070304	91031000	1050	Acres	Manganese	Metals/Metalloids	List on 303(d) list (TMDL required list)	5A	2019			
9	Regional Board 9 - San Diego Region	Otay Reservoir, Lower	CAL9103100019991117155943	Lake & Reservoir	L	5	18070304	91031000	1050	Acres	Nitrogen	Nutrients	List on 303(d) list (TMDL required list)	5A	2021			
9	Regional Board 9 - San Diego Region	Otay Reservoir, Lower	CAL9103100019991117155943	Lake & Reservoir	L	5	18070304	91031000	1050	Acres	pH (high)	Miscellaneous	List on 303(d) list (TMDL required list)	5A	2019			
9	Regional Board 9 - San Diego Region	Pacific Ocean Shoreline, Aliso HSA, at Aliso Beach - middle	CAC9011300020090525212958	Coastal & Bay Shoreline	C	5	18070301	90113000	0.03	Miles	Enterococcus	Pathogens	Do Not Delist from 303(d) list (TMDL required list)	5A	2021			
9	Regional Board 9 - San Diego Region	Pacific Ocean Shoreline, Aliso HSA, at Aliso Beach - middle	CAC9011300020090525212958	Coastal & Bay Shoreline	C	5	18070301	90113000	0.03	Miles	Total Coliform	Pathogens	Do Not Delist from 303(d) list (TMDL required list)	5A	2021			
9	Regional Board 9 - San Diego Region	Pacific Ocean Shoreline, Aliso HSA, at Aliso Creek mouth	CAC9011300020090525212513	Coastal & Bay Shoreline	C	5	18070301	90113000	0.03	Miles	Enterococcus	Pathogens	Do Not Delist from 303(d) list (TMDL required list)	5A	2021			
9	Regional Board 9 - San Diego Region	Pacific Ocean Shoreline, Aliso HSA, at Aliso Creek mouth	CAC9011300020090525212513	Coastal & Bay Shoreline	C	5	18070301	90113000	0.03	Miles	Fecal Coliform	Pathogens	Do Not Delist from 303(d) list (TMDL required list)	5A	2021			
9	Regional Board 9 - San Diego Region	Pacific Ocean Shoreline, Aliso HSA, at Aliso Creek mouth	CAC9011300020090525212513	Coastal & Bay Shoreline	C	5	18070301	90113000	0.03	Miles	Total Coliform	Pathogens	Do Not Delist from 303(d) list (TMDL required list)	5A	2012			
9	Regional Board 9 - San Diego Region	Pacific Ocean Shoreline, Batiquitos HSA, at Moonlight State Beach (Cottonwood Creek outlet)	CAC9045100020091026142908	Coastal & Bay Shoreline	C	5	1807303	90451000	0.03	Miles	Total Coliform	Pathogens	Do Not Delist from 303(d) list (TMDL required list)	5A	2019			
9	Regional Board 9 - San Diego Region	Pacific Ocean Shoreline, Coronado HA, at Silver Strand (north end, Oceanside)	CAC9101000020091104114820	Coastal & Bay Shoreline	C	5	18070304	91010000	0.03	Miles	Enterococcus	Pathogens	List on 303(d) list (TMDL required list)	5A	2021			
9	Regional Board 9 - San Diego Region	Pacific Ocean Shoreline, Dana Point HSA, at Aliso Beach at West Street	CAC9011400020090725220259	Coastal & Bay Shoreline	C	5	18070301	90114000	0.03	Miles	Indicator Bacteria	Pathogens	List on 303(d) list (TMDL required list)	5A	2005			
9	Regional Board 9 - San Diego Region	Pacific Ocean Shoreline, Dana Point HSA, at Dana Point Harbor at Baby Beach	CAC9011400020091116103327	Coastal & Bay Shoreline	C	5	18070301	90114000	0.03	Miles	Enterococcus	Pathogens	Do Not Delist from 303(d) list (TMDL required list)	5A	2012			
9	Regional Board 9 - San Diego Region	Pacific Ocean Shoreline, Dana Point HSA, at Dana Point Harbor at Baby Beach	CAC9011400020091116103327	Coastal & Bay Shoreline	C	5	18070301	90114000	0.03	Miles	Total Coliform	Pathogens	Do Not Delist from 303(d) list (TMDL required list)	5A	2012			
9	Regional Board 9 - San Diego Region	Pacific Ocean Shoreline, Dana Point HSA, at Salt Creek outlet at Monarch Beach	CAC9011400020090505125551	Coastal & Bay Shoreline	C	5	18070301	90114000	0.03	Miles	Total Coliform	Pathogens	Do Not Delist from 303(d) list (TMDL required list)	5A	2021			
9	Regional Board 9 - San Diego Region	Pacific Ocean Shoreline, Imperial Beach Pier	CAC9101000020050918172745	Coastal & Bay Shoreline	C	5	18070305	91010000	0.42	Miles	Fecal Coliform	Pathogens	List on 303(d) list (TMDL required list)	5A	2019			
9	Regional Board 9 - San Diego Region	Pacific Ocean Shoreline, Imperial Beach Pier	CAC9101000020050918172745	Coastal & Bay Shoreline	C	5	18070305	91010000	0.42	Miles	PCBs (Polychlorinated biphenyls)	Other Organics	Do Not Delist from 303(d) list (TMDL required list)	5A	2019			
9	Regional Board 9 - San Diego Region	Pacific Ocean Shoreline, Imperial Beach Pier	CAC9101000020050918172745	Coastal & Bay Shoreline	C	5	18070305	91010000	0.42	Miles	Total Coliform	Pathogens	List on 303(d) list (TMDL required list)	5A	2019			
9	Regional Board 9 - San Diego Region	Pacific Ocean Shoreline, Laguna Beach HSA, at Main Beach	CAC9011200020090505104552	Coastal & Bay Shoreline	C	5	18070301	90112000	0.03	Miles	Total Coliform	Pathogens	Do Not Delist from 303(d) list (TMDL required list)	5A	2021			
9	Regional Board 9 - San Diego Region	Pacific Ocean Shoreline, Loma Alta HSA, at Loma Alta Creek mouth	CAC9041000020091104171140	Coastal & Bay Shoreline	C	5	18070303	90410000	0.03	Miles	Indicator Bacteria	Pathogens	Do Not Delist from 303(d) list (TMDL required list)	5A	2019			
9	Regional Board 9 - San Diego Region	Pacific Ocean Shoreline, Lower San Juan HSA, at North Beach Creek	CAC9012000020090505154613	Coastal & Bay Shoreline	C	5	18070301	90120000	0.03	Miles	Enterococcus	Pathogens	Do Not Delist from 303(d) list (TMDL required list)	5A	2021			
9	Regional Board 9 - San Diego Region	Pacific Ocean Shoreline, Lower San Juan HSA, at North Beach Creek	CAC9012000020090505154613	Coastal & Bay Shoreline	C	5	18070301	90120000	0.03	Miles	Fecal Coliform	Pathogens	Do Not Delist from 303(d) list (TMDL required list)	5A	2021			
9	Regional Board 9 - San Diego Region	Pacific Ocean Shoreline, Lower San Juan HSA, at North Beach Creek	CAC9012000020090505154613	Coastal & Bay Shoreline	C	5	18070301	90120000	0.03	Miles	Total Coliform	Pathogens	Do Not Delist from 303(d) list (TMDL required list)	5A	2021			
9	Regional Board 9 - San Diego Region	Pacific Ocean Shoreline, Lower San Juan HSA, at North Doheny State Park Campground	CAC9013000020090505155824	Coastal & Bay Shoreline	C	5	18070301	90130000	0.03	Miles	Enterococcus	Pathogens	List on 303(d) list (TMDL required list)	5A	2021			
9	Regional Board 9 - San Diego Region	Pacific Ocean Shoreline, Lower San Juan HSA, at North Doheny State Park Campground	CAC9013000020090505155824	Coastal & Bay Shoreline	C	5	18070301	90130000	0.03	Miles	Total Coliform	Pathogens	List on 303(d) list (TMDL required list)	5A	2021			
9	Regional Board 9 - San Diego Region	Pacific Ocean Shoreline, Lower San Juan HSA, at San Juan Creek	CAC9012000020090505155231	Coastal & Bay Shoreline	C	5	18070301	90120000	0.03	Miles	Enterococcus	Pathogens	Do Not Delist from 303(d) list (TMDL required list)	5A	2021			
9	Regional Board 9 - San Diego Region	Pacific Ocean Shoreline, Lower San Juan HSA, at San Juan Creek	CAC9012000020090505155231	Coastal & Bay Shoreline	C	5	18070301	90120000	0.03	Miles	Fecal Coliform	Pathogens	Do Not Delist from 303(d) list (TMDL required list)	5A	2021			
9	Regional Board 9 - San Diego Region	Pacific Ocean Shoreline, Lower San Juan HSA, at San Juan Creek	CAC9012000020090505155231	Coastal & Bay Shoreline	C	5	18070301	90120000	0.03	Miles	Total Coliform	Pathogens	Do Not Delist from 303(d) list (TMDL required list)	5A	2021			
9	Regional Board 9 - San Diego Region	Pacific Ocean Shoreline, Lower San Juan HSA, at South Doheny State Park Campground	CAC9013000020090505162035	Coastal & Bay Shoreline	C	5	18070301	90130000	0.03	Miles	Enterococcus	Pathogens	List on 303(d) list (TMDL required list)	5A	2021			
9	Regional Board 9 - San Diego Region	Pacific Ocean Shoreline, Miramar Reservoir HA, at Los Penasquitos River mouth	CAX9061000020021127155300	Coastal & Bay Shoreline	C	5	18070304	90610000	0.39	Miles	Total Coliform	Pathogens	List on 303(d) list (TMDL required list)	5A	2019			
9	Regional Board 9 - San Diego Region	Pacific Ocean Shoreline, Otay Valley HA, at Carnation Ave and Camp Surf Jetty	CAC9101000020091104133208	Coastal & Bay Shoreline	C	5	18070305	91010000	0.03	Miles	Total Coliform	Pathogens	List on 303(d) list (TMDL required list)	5A	2019			
9	Regional Board 9 - San Diego Region	Pacific Ocean Shoreline, Point Loma HA, at Bermuda Ave	CAC9081000020091104104343	Coastal & Bay Shoreline	C	5	18070304	90810000	0.03	Miles	Total Coliform	Pathogens	List on 303(d) list (TMDL required list)	5A	2019			
9	Regional Board 9 - San Diego Region	Pacific Ocean Shoreline, San Clemente HA, at Poche Beach	CAC9013000020090418220913	Coastal & Bay Shoreline	C	5	18070301	90130000	0.03	Miles	Enterococcus	Pathogens	Do Not Delist from 303(d) list (TMDL required list)	5A	2019			
9	Regional Board 9 - San Diego Region	Pacific Ocean Shoreline, San Clemente HA, at Poche Beach	CAC9013000020090418220913	Coastal & Bay Shoreline	C	5	18070301	90130000	0.03	Miles	Total Coliform	Pathogens	Do Not Delist from 303(d) list (TMDL required list)	5A	2019			
9	Regional Board 9 - San Diego Region	Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach at Pier	CAC9013000020090419001811	Coastal & Bay Shoreline	C	5	18070301	90130000	0.03	Miles	Enterococcus	Pathogens	Do Not Delist from 303(d) list (TMDL required list)	5A	2019			
9	Regional Board 9 - San Diego Region	Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach, North Beach	CAC9013000020090418232344	Coastal & Bay Shoreline	C	5	18070301	90130000	0.03	Miles	Total Coliform	Pathogens	List on 303(d) list (TMDL required list)	5A	2019			
9	Regional Board 9 - San Diego Region	Pacific Ocean Shoreline, San Clemente HA, at South Capistrano Beach at Beach Road	CAC9013000020090505160142	Coastal & Bay Shoreline	C	5	18070301	90130000	0.03	Miles	Enterococcus	Pathogens	Do Not Delist from 303(d) list (TMDL required list)	5A	2021			
9	Regional Board 9 - San Diego Region	Pacific Ocean Shoreline, San Clemente HA, at South Capistrano County Beach	CAC9013000020090526120147	Coastal & Bay Shoreline	C	5	18070301	90130000	0.03	Miles	Enterococcus	Pathogens	Do Not Delist from 303(d) list (TMDL required list)	5A	2012			
9	Regional Board 9 - San Diego Region	Pacific Ocean Shoreline, San Clemente HA, at South Capistrano County Beach	CAC9013000020090526120147	Coastal & Bay Shoreline	C	5	18070301	90130000	0.03	Miles	Total Coliform	Pathogens	Do Not Delist from 303(d) list (TMDL required list)	5A	2021			
9	Regional Board 9 - San Diego Region	Pacific Ocean Shoreline, San Diego HU, at the San Diego River outlet, at Dog Beach	CAC9071100020091104131050	Coastal & Bay Shoreline	C	5	18070304	90711000	0.03	Miles	Enterococcus	Pathogens	Do Not Delist from 303(d) list (TMDL required list)	5A	2021			
9	Regional Board 9 - San Diego Region	Pacific Ocean Shoreline, San Diego HU, at the San Diego River outlet, at Dog Beach	CAC9071100020091104131050	Coastal & Bay Shoreline	C	5	18070304	90711000	0.03	Miles	Total Coliform	Pathogens	Do Not Delist from 303(d) list (TMDL required list)	5A	2010			
9	Regional Board 9 - San Diego Region	Pacific Ocean Shoreline, San Dieguito HU, at San Dieguito Lagoon Mouth at San Dieguito River Beach	CAC9051100020091026215544	Coastal & Bay Shoreline	C	5	18070304	90511000	0.03	Miles	Total Coliform	Pathogens	Do Not Delist from 303(d) list (TMDL required list)	5A	2010			
9	Regional Board 9 - San Diego Region	Pacific Ocean Shoreline, San Elijo HSA, at Cardiff State Beach at San Elijo Lagoon	CAX9046100019991116164230	Coastal & Bay Shoreline	C	5	18070303	90461000	0.44	Miles	Total Coliform	Pathogens	Do Not Delist from 303(d) list (TMDL required list)	5A	2008			
9	Regional Board 9 - San Diego Region	Pacific Ocean Shoreline, San Luis Rey HU, at San Luis Rey River mouth	CAC9031100020090626115722	Coastal & Bay Shoreline	C	5	18070302	90311000	0.03	Miles	Enterococcus	Pathogens	Do Not Delist from 303(d) list (TMDL required list)	5A	2021			
9	Regional Board 9 - San Diego Region	Pacific Ocean Shoreline, San Luis Rey HU, at San Luis Rey River mouth	CAC9031100020090626115722	Coastal & Bay Shoreline	C	5	18070302	90311000	0.03	Miles	Total Coliform	Pathogens	Do Not Delist from 303(d) list (TMDL required list)	5A	2021			
9	Regional Board 9 - San Diego Region	Pacific Ocean Shoreline, San Mateo Canyon HA, at San Mateo Creek outlet	CAC9014000020090218165222	Coastal & Bay Shoreline	C	5	18070301	90140000	0.31	Miles	Total Coliform	Pathogens	List on 303(d) list (TMDL required list)	5A	2019			
9	Regional Board 9 - San Diego Region	Pacific Ocean Shoreline, Scripps HA, at Avenida de la Playa at La Jolla Shores Beach	CAC9063000020090422160501	Coastal & Bay Shoreline	C	5	18070304	90630000	0.03	Miles	Total Coliform	Pathogens	List on 303(d) list (TMDL required list)	5A	2019			
9	Regional Board 9 - San Diego Region	Pacific Ocean Shoreline, Scripps HA, at Childrens Pool	CAC9063000020090626111813	Coastal & Bay Shoreline	C	5	18070304	90630000	0.03	Miles	Enterococcus	Pathogens	Do Not Delist from 303(d) list (TMDL required list)	5A	2021			

2010 California 303(d) List of Water Quality Limited Segments*

Water quality limited segments requiring a TMDL(5A), being addressed by TMDL(5B), and/or being addressed by an action other than TMDL(5C).

REGION	REGION NAME	WATER BODY NAME	WBID	WATER BODY TYPE	WBTYPE CODE	INTEGRATED REPORT CATEGORY	USGS CATALOGING UNIT*	CALWATER WATERSHED	ESTIMATED SIZE AFFECTED	UNIT	POLLUTANT	POLLUTANT CATEGORY	FINAL LISTING DECISION	TMDL REQUIREMENT STATUS**	EXPECTED TMDL COMPLETION DATE***	EXPECTED ATTAINMENT DATE***	USEPA TMDL APPROVED DATE***	COMMENTS INCLUDED ON 303(d) LIST
9	Regional Board 9 - San Diego Region	Pacific Ocean Shoreline, Scripps HA, at Childrens Pool	CAC906300002009062611813	Coastal & Bay Shoreline	C	5	18070304	90630000	0.03	Miles	Fecal Coliform	Pathogens	Do Not Delist from 303(d) list (TMDL required list)	5A	2021			
9	Regional Board 9 - San Diego Region	Pacific Ocean Shoreline, Scripps HA, at Childrens Pool	CAC906300002009062611813	Coastal & Bay Shoreline	C	5	18070304	90630000	0.03	Miles	Total Coliform	Pathogens	Do Not Delist from 303(d) list (TMDL required list)	5A	2021			
9	Regional Board 9 - San Diego Region	Pacific Ocean Shoreline, Scripps HA, at La Jolla Cove	CAC906300002009042216252O	Coastal & Bay Shoreline	C	5	18070304	90630000	0.03	Miles	Total Coliform	Pathogens	List on 303(d) list (TMDL required list)	5A	2019			
9	Regional Board 9 - San Diego Region	Pacific Ocean Shoreline, Scripps HA, at Pacific Beach Point , Pacific Beach	CAC906300002009042217105 7	Coastal & Bay Shoreline	C	5	18070304	90630000	0.03	Miles	Enterococcus	Pathogens	List on 303(d) list (TMDL required list)	5A	2019			
9	Regional Board 9 - San Diego Region	Pacific Ocean Shoreline, Scripps HA, at Pacific Beach Point , Pacific Beach	CAC906300002009042217105 7	Coastal & Bay Shoreline	C	5	18070304	90630000	0.03	Miles	Fecal Coliform	Pathogens	List on 303(d) list (TMDL required list)	5A	2019			
9	Regional Board 9 - San Diego Region	Pacific Ocean Shoreline, Scripps HA, at Pacific Beach Point , Pacific Beach	CAC906300002009042217105 7	Coastal & Bay Shoreline	C	5	18070304	90630000	0.03	Miles	Total Coliform	Pathogens	List on 303(d) list (TMDL required list)	5A	2019			
9	Regional Board 9 - San Diego Region	Pacific Ocean Shoreline, Scripps HA, at Ravina	CAC906300002009042216443O	Coastal & Bay Shoreline	C	5	18070304	90630000	0.03	Miles	Total Coliform	Pathogens	List on 303(d) list (TMDL required list)	5A	2019			
9	Regional Board 9 - San Diego Region	Pacific Ocean Shoreline, Scripps HA, at Vallecitos Court at La Jolla Shores Beach	CAC906300002009052016564 3	Coastal & Bay Shoreline	C	5	18070304	90630000	0.03	Miles	Total Coliform	Pathogens	List on 303(d) list (TMDL required list)	5A	2021			
9	Regional Board 9 - San Diego Region	Pacific Ocean Shoreline, Tijuana HU, at 3/4 mile North of Tijuana River	CAC911110002009050134454	Coastal & Bay Shoreline	C	5	18070305	91111000	0.03	Miles	Enterococcus	Pathogens	Do Not Delist from 303(d) list (TMDL required list)	5A	2021			
9	Regional Board 9 - San Diego Region	Pacific Ocean Shoreline, Tijuana HU, at 3/4 mile North of Tijuana River	CAC911110002009050134454	Coastal & Bay Shoreline	C	5	18070305	91111000	0.03	Miles	Fecal Coliform	Pathogens	Do Not Delist from 303(d) list (TMDL required list)	5A	2021			
9	Regional Board 9 - San Diego Region	Pacific Ocean Shoreline, Tijuana HU, at 3/4 mile North of Tijuana River	CAC911110002009050134454	Coastal & Bay Shoreline	C	5	18070305	91111000	0.03	Miles	Total Coliform	Pathogens	Do Not Delist from 303(d) list (TMDL required list)	5A	2021			
9	Regional Board 9 - San Diego Region	Pacific Ocean Shoreline, Tijuana HU, at Monument Road	CAC911110002009050135322	Coastal & Bay Shoreline	C	5	18070305	91111000	0.03	Miles	Fecal Coliform	Pathogens	Do Not Delist from 303(d) list (TMDL required list)	5A	2021			
9	Regional Board 9 - San Diego Region	Pacific Ocean Shoreline, Tijuana HU, at Monument Road	CAC911110002009050135322	Coastal & Bay Shoreline	C	5	18070305	91111000	0.03	Miles	Total Coliform	Pathogens	Do Not Delist from 303(d) list (TMDL required list)	5A	2019			
9	Regional Board 9 - San Diego Region	Pacific Ocean Shoreline, Tijuana HU, at Tijuana River mouth	CAC911110002009050134951	Coastal & Bay Shoreline	C	5	18070305	91111000	0.03	Miles	Enterococcus	Pathogens	Do Not Delist from 303(d) list (TMDL required list)	5A	2019			
9	Regional Board 9 - San Diego Region	Pacific Ocean Shoreline, Tijuana HU, at Tijuana River mouth	CAC911110002009050134951	Coastal & Bay Shoreline	C	5	18070305	91111000	0.03	Miles	Fecal Coliform	Pathogens	Do Not Delist from 303(d) list (TMDL required list)	5A	2019			
9	Regional Board 9 - San Diego Region	Pacific Ocean Shoreline, Tijuana HU, at Tijuana River mouth	CAC911110002009050134951	Coastal & Bay Shoreline	C	5	18070305	91111000	0.03	Miles	Total Coliform	Pathogens	Do Not Delist from 303(d) list (TMDL required list)	5A	2019			
9	Regional Board 9 - San Diego Region	Pacific Ocean Shoreline, Tijuana HU, at end of Seacoast Drive	CAC911110002009050131259	Coastal & Bay Shoreline	C	5	18070305	91111000	0.03	Miles	Enterococcus	Pathogens	Do Not Delist from 303(d) list (TMDL required list)	5A	2021			
9	Regional Board 9 - San Diego Region	Pacific Ocean Shoreline, Tijuana HU, at end of Seacoast Drive	CAC911110002009050131259	Coastal & Bay Shoreline	C	5	18070305	91111000	0.03	Miles	Fecal Coliform	Pathogens	Do Not Delist from 303(d) list (TMDL required list)	5A	2021			
9	Regional Board 9 - San Diego Region	Pacific Ocean Shoreline, Tijuana HU, at end of Seacoast Drive	CAC911110002009050131259	Coastal & Bay Shoreline	C	5	18070305	91111000	0.03	Miles	Total Coliform	Pathogens	Do Not Delist from 303(d) list (TMDL required list)	5A	2019			
9	Regional Board 9 - San Diego Region	Pacific Ocean Shoreline, Tijuana HU, at the US Border	CAC911110002009050135528	Coastal & Bay Shoreline	C	5	18070305	91111000	0.03	Miles	Enterococcus	Pathogens	Do Not Delist from 303(d) list (TMDL required list)	5A	2021			
9	Regional Board 9 - San Diego Region	Pacific Ocean Shoreline, Tijuana HU, at the US Border	CAC911110002009050135528	Coastal & Bay Shoreline	C	5	18070305	91111000	0.03	Miles	Fecal Coliform	Pathogens	Do Not Delist from 303(d) list (TMDL required list)	5A	2021			
9	Regional Board 9 - San Diego Region	Pacific Ocean Shoreline, Tijuana HU, at the US Border	CAC911110002009050135528	Coastal & Bay Shoreline	C	5	18070305	91111000	0.03	Miles	Total Coliform	Pathogens	Do Not Delist from 303(d) list (TMDL required list)	5A	2019			
9	Regional Board 9 - San Diego Region	Paleta Creek	CAR908310002008082509282 3	River & Stream	R	5	18070304	90831000	4.1	Miles	Copper	Metals/Metalloids	List on 303(d) list (TMDL required list)	5A	2021			
9	Regional Board 9 - San Diego Region	Paleta Creek	CAR908310002008082509282 3	River & Stream	R	5	18070304	90831000	4.1	Miles	Lead	Metals/Metalloids	List on 303(d) list (TMDL required list)	5A	2021			
9	Regional Board 9 - San Diego Region	Paradise Creek, HSA 908.320	CAR909120001999111709213 1	River & Stream	R	5	18070304	90912000	2.8	Miles	Selenium	Metals/Metalloids	List on 303(d) list (TMDL required list)	5A	2021			
9	Regional Board 9 - San Diego Region	Pine Valley Creek (Upper)	CAR911410002001092411302 7	River & Stream	R	5	18070305	91141000	2.9	Miles	Turbidity	Sediment	List on 303(d) list (TMDL required list)	5A	2019			
9	Regional Board 9 - San Diego Region	Poggi Canyon Creek	CAR910200002005063212210 6	River & Stream	R	5	18070304	91020000	7.8	Miles	Toxicity	Toxicity	List on 303(d) list (TMDL required list)	5A	2021			
9	Regional Board 9 - San Diego Region	Poway Creek	CAR906200002008090417263 6	River & Stream	R	5	18070304	90620000	7.3	Miles	Selenium	Metals/Metalloids	List on 303(d) list (TMDL required list)	5A	2021			
9	Regional Board 9 - San Diego Region	Poway Creek	CAR906200002008090417263 6	River & Stream	R	5	18070304	90620000	7.3	Miles	Toxicity	Toxicity	List on 303(d) list (TMDL required list)	5A	2021			
9	Regional Board 9 - San Diego Region	Prima Deshecha Creek	CAR901300002001092409084 3	River & Stream	R	5	18070301	90130000	1.2	Miles	Cadmium	Metals/Metalloids	List on 303(d) list (TMDL required list)	5A	2021			
9	Regional Board 9 - San Diego Region	Prima Deshecha Creek	CAR901300002001092409084 3	River & Stream	R	5	18070301	90130000	1.2	Miles	Nickel	Metals/Metalloids	List on 303(d) list (TMDL required list)	5A	2021			
9	Regional Board 9 - San Diego Region	Prima Deshecha Creek	CAR901300002001092409084 3	River & Stream	R	5	18070301	90130000	1.2	Miles	Phosphorus	Nutrients	Do Not Delist from 303(d) list (TMDL required list)	5A	2019			
9	Regional Board 9 - San Diego Region	Prima Deshecha Creek	CAR901300002001092409084 3	River & Stream	R	5	18070301	90130000	1.2	Miles	Turbidity	Sediment	Do Not Delist from 303(d) list (TMDL required list)	5A	2019			
9	Regional Board 9 - San Diego Region	Rainbow Creek	CAR902220001998080310233 3	River & Stream	R	5	18070302	90222000	5.0	Miles	Iron	Metals/Metalloids	List on 303(d) list (TMDL required list)	5A	2019			
9	Regional Board 9 - San Diego Region	Rainbow Creek	CAR902220001998080310233 3	River & Stream	R	5	18070302	90222000	5.0	Miles	Nitrogen	Nutrients	Do Not Delist from 303(d) list (being addressed with USEPA approved TMDL)	5B			3/22/2006	
9	Regional Board 9 - San Diego Region	Rainbow Creek	CAR902220001998080310233 3	River & Stream	R	5	18070302	90222000	5.0	Miles	Phosphorus	Nutrients	Do Not Delist from 303(d) list (being addressed with USEPA approved TMDL)	5B			3/22/2006	
9	Regional Board 9 - San Diego Region	Rainbow Creek	CAR902220001998080310233 3	River & Stream	R	5	18070302	90222000	5.0	Miles	Sulfates	Other Inorganics	List on 303(d) list (TMDL required list)	5A	2019			
9	Regional Board 9 - San Diego Region	Rainbow Creek	CAR902220001998080310233 3	River & Stream	R	5	18070302	90222000	5.0	Miles	Total Dissolved Solids	Salinity	List on 303(d) list (TMDL required list)	5A	2019			
9	Regional Board 9 - San Diego Region	Redhawk Channel	CAR902510002008090417132 7	River & Stream	R	5	18070302	90251000	0.15	Miles	Chlorpyrifos	Pesticides	List on 303(d) list (TMDL required list)	5A	2021			
9	Regional Board 9 - San Diego Region	Redhawk Channel	CAR902510002008090417132 7	River & Stream	R	5	18070302	90251000	0.15	Miles	Copper	Metals/Metalloids	List on 303(d) list (TMDL required list)	5A	2021			
9	Regional Board 9 - San Diego Region	Redhawk Channel	CAR902510002008090417132 7	River & Stream	R	5	18070302	90251000	0.15	Miles	Diazinon	Pesticides	List on 303(d) list (TMDL required list)	5A	2021			
9	Regional Board 9 - San Diego Region	Redhawk Channel	CAR902510002008090417132 7	River & Stream	R	5	18070302	90251000	0.15	Miles	Escherichia coli (E. coli)	Pathogens	List on 303(d) list (TMDL required list)	5A	2021			
9	Regional Board 9 - San Diego Region	Redhawk Channel	CAR902510002008090417132 7	River & Stream	R	5	18070302	90251000	0.15	Miles	Fecal Coliform	Pathogens	List on 303(d) list (TMDL required list)	5A	2021			
9	Regional Board 9 - San Diego Region	Redhawk Channel	CAR902510002008090417132 7	River & Stream	R	5	18070302	90251000	0.15	Miles	Iron	Metals/Metalloids	List on 303(d) list (TMDL required list)	5A	2021			
9	Regional Board 9 - San Diego Region	Redhawk Channel	CAR902510002008090417132 7	River & Stream	R	5	18070302	90251000	0.15	Miles	Manganese	Metals/Metalloids	List on 303(d) list (TMDL required list)	5A	2021			
9	Regional Board 9 - San Diego Region	Redhawk Channel	CAR902510002008090417132 7	River & Stream	R	5	18070302	90251000	0.15	Miles	Nitrogen	Nutrients	List on 303(d) list (TMDL required list)	5A	2021			
9	Regional Board 9 - San Diego Region	Redhawk Channel	CAR902510002008090417132 7	River & Stream	R	5	18070302	90251000	0.15	Miles	Phosphorus	Nutrients	List on 303(d) list (TMDL required list)	5A	2021			
9	Regional Board 9 - San Diego Region	Redhawk Channel	CAR902510002008090417132 7	River & Stream	R	5	18070302	90251000	0.15	Miles	Total Dissolved Solids	Salinity	List on 303(d) list (TMDL required list)	5A	2021			
9	Regional Board 9 - San Diego Region	Rose Creek	CAR906400002001102513273 2	River & Stream	R	5	18070304	90640000	13	Miles	Selenium	Metals/Metalloids	List on 303(d) list (TMDL required list)	5A	2021			
9	Regional Board 9 - San Diego Region	Rose Creek	CAR906400002001102513273 2	River & Stream	R	5	18070304	90640000	13	Miles	Toxicity	Toxicity	List on 303(d) list (TMDL required list)	5A	2021			
9	Regional Board 9 - San Diego Region	San Diego Bay	CAB910100001999021032422	Bay & Harbor	B	5	18070304	91010000	10783	Acres	PCBs (Polychlorinated biphenyls)	Other Organics	List on 303(d) list (TMDL required list)	5A	2019			
9	Regional Board 9 - San Diego Region	San Diego Bay Shoreline, 32nd St San Diego Naval Station	CAB908310001999021010512 1	Bay & Harbor	B	5	18070304	90822000	103	Acres	Benthic Community Effects	Miscellaneous	List on 303(d) list (TMDL required list)	5A	2019			
9	Regional Board 9 - San Diego Region	San Diego Bay Shoreline, 32nd St San Diego Naval Station	CAB908310001999021010512 1	Bay & Harbor	B	5	18070304	90822000	103	Acres	Sediment Toxicity	Toxicity	List on 303(d) list (TMDL required list)	5A	2019			
9	Regional Board 9 - San Diego Region	San Diego Bay Shoreline, Chula Vista Marina	CAX909120002002120608593 8	Coastal & Bay Shoreline	C	5	18070304	90912000	0.41	Miles	Copper	Metals/Metalloids	List on 303(d) list (TMDL required list)	5A	2019			
9	Regional Board 9 - San Diego Region	San Diego Bay Shoreline, Downtown Anchorage	CAB908210001999021009181 6	Bay & Harbor	B	5	18070304	90821000	7.4	Acres	Benthic Community Effects	Miscellaneous	List on 303(d) list (TMDL required list)	5A	2019			
9	Regional Board 9 - San Diego Region	San Diego Bay Shoreline, Downtown Anchorage	CAB908210001999021009181 6	Bay & Harbor	B	5	18070304	90821000	7.4	Acres	Sediment Toxicity	Toxicity	List on 303(d) list (TMDL required list)	5A	2019			
9	Regional Board 9 - San Diego Region	San Diego Bay Shoreline, G Street Pier	CAX908210002002120213054 2	Coastal & Bay Shoreline	C	5	18070304	90821000	0.42	Miles	Total Coliform	Pathogens	List on 303(d) list (TMDL required list)	5A	2019			
9	Regional Board 9 - San Diego Region	San Diego Bay Shoreline, North of 24th Street Marine Terminal	CAB908320001999021011042 1	Bay & Harbor	B	5	18070304	90832000	9.5	Acres	Benthic Community Effects	Miscellaneous	List on 303(d) list (TMDL required list)	5A	2019			
9	Regional Board 9 - San Diego Region	San Diego Bay Shoreline, North of 24th Street Marine Terminal	CAB908320001999021011042 1	Bay & Harbor	B	5	18070304	90832000	9.5	Acres	Sediment Toxicity	Toxicity	List on 303(d) list (TMDL required list)	5A	2019			
9	Regional Board 9 - San Diego Region	San Diego Bay Shoreline, Seventh Street Channel	CAB908320001999021010582 9	Bay & Harbor	B	5	18070304	90831000	9.0	Acres	Benthic Community Effects	Miscellaneous	List on 303(d) list (TMDL required list)	5A	2008			
9	Regional Board 9 - San Diego Region	San Diego Bay Shoreline, Seventh Street Channel	CAB908320001999021010582 9	Bay & Harbor	B	5	18070304	90831000	9.0	Acres	Sediment Toxicity	Toxicity	List on 303(d) list (TMDL required list)	5A	2008			
9	Regional Board 9 - San Diego Region	San Diego Bay Shoreline, Shelter Island Shoreline Park	CAX908100002002080513564 7	Coastal & Bay Shoreline	C	5	18070304	90810000	0.42	Miles	Enterococcus	Pathogens	Do Not Delist from 303(d) list (TMDL required list)	5A	2011			
9	Regional Board 9 - San Diego Region	San Diego Bay Shoreline, Shelter Island Shoreline Park	CAX908100002002080513564 7	Coastal & Bay Shoreline	C	5	18070304	90810000	0.42	Miles	Fecal Coliform	Pathogens	Do Not Delist from 303(d) list (TMDL required list)	5A	2011			
9	Regional Board 9 - San Diego Region	San Diego Bay Shoreline, Shelter Island Shoreline Park	CAX908100002002080513564 7	Coastal & Bay Shoreline	C	5	18070304	90810000	0.42	Miles	Total Coliform	Pathogens	Do Not Delist from 303(d) list (TMDL required list)	5A	2011			
9	Regional Board 9 - San Diego Region	San Diego Bay Shoreline, Tidelands Park	CAX910100002002080514065 3	Coastal & Bay Shoreline	C	5	18070304	91010000	0.38	Miles	Enterococcus	Pathogens	List on 303(d) list (TMDL required list)	5A	2021			

2010 California 303(d) List of Water Quality Limited Segments*

Water quality limited segments requiring a TMDL(5A), being addressed by TMDL(5B), and/or being addressed by an action other than TMDL(5C).

REGION	REGION NAME	WATER BODY NAME	WBID	WATER BODY TYPE	WBTYPE CODE	INTEGRATED REPORT CATEGORY	USGS CATALOGING UNIT*	CALWATER WATERSHED	ESTIMATED SIZE AFFECTED	UNIT	POLLUTANT	POLLUTANT CATEGORY	FINAL LISTING DECISION	TMDL REQUIREMENT STATUS**	EXPECTED TMDL COMPLETION DATE***	EXPECTED ATTAINMENT DATE***	USEPA TMDL APPROVED DATE***	COMMENTS INCLUDED ON 303(d) LIST
9	Regional Board 9 - San Diego Region	San Diego Bay Shoreline, Tidelands Park	CAX910100002002080514065 3	Coastal & Bay Shoreline	C	5	18070304	91010000	0.38	Miles	Total Coliform	Pathogens	List on 303(d) list (TMDL required list)	5A	2019			
9	Regional Board 9 - San Diego Region	San Diego Bay Shoreline, Vicinity of B St and Broadway Piers	CAB908210001999021009264 0	Bay & Harbor	B	5	18070304	90821000	10	Acres	Benthic Community Effects	Miscellaneous	List on 303(d) list (TMDL required list)	5A	2019			
9	Regional Board 9 - San Diego Region	San Diego Bay Shoreline, Vicinity of B St and Broadway Piers	CAB908210001999021009264 0	Bay & Harbor	B	5	18070304	90821000	10	Acres	Sediment Toxicity	Toxicity	List on 303(d) list (TMDL required list)	5A	2019			
9	Regional Board 9 - San Diego Region	San Diego Bay Shoreline, Vicinity of B St and Broadway Piers	CAB908210001999021009264 0	Bay & Harbor	B	5	18070304	90821000	10	Acres	Total Coliform	Pathogens	Do Not Delist from 303(d) list (TMDL required list)	5A	2019			
9	Regional Board 9 - San Diego Region	San Diego Bay Shoreline, at Americas Cup Harbor	CAB908100002002030712450 0	Bay & Harbor	B	5	18070304	90810000	88	Acres	Copper	Metals/Metalloids	List on 303(d) list (TMDL required list)	5A	2019			
9	Regional Board 9 - San Diego Region	San Diego Bay Shoreline, at Bayside Park (J Street)	CAB909110002004120920520 8	Bay & Harbor	B	5	18070304	90911000	50	Acres	Enterococcus	Pathogens	Do Not Delist from 303(d) list (TMDL required list)	5A	2021			
9	Regional Board 9 - San Diego Region	San Diego Bay Shoreline, at Bayside Park (J Street)	CAB909110002004120920520 8	Bay & Harbor	B	5	18070304	90911000	50	Acres	Total Coliform	Pathogens	Do Not Delist from 303(d) list (TMDL required list)	5A	2019			This listing was made by USEPA for 2006.
9	Regional Board 9 - San Diego Region	San Diego Bay Shoreline, at Coronado Cays	CAB910100002004120919185 2	Bay & Harbor	B	5	18070304	91010000	47	Acres	Copper	Metals/Metalloids	List on 303(d) list (TMDL required list)	5A	2019			
9	Regional Board 9 - San Diego Region	San Diego Bay Shoreline, at Glorietta Bay	CAB910100002004120918533 9	Bay & Harbor	B	5	18070304	91010000	52	Acres	Copper	Metals/Metalloids	List on 303(d) list (TMDL required list)	5A	2019			
9	Regional Board 9 - San Diego Region	San Diego Bay Shoreline, at Harbor Island (East Basin)	CAB908210002002123011292 6	Bay & Harbor	B	5	18070304	90821000	73	Acres	Copper	Metals/Metalloids	List on 303(d) list (TMDL required list)	5A	2019			
9	Regional Board 9 - San Diego Region	San Diego Bay Shoreline, at Harbor Island (West Basin)	CAB908100002002030610411 0	Bay & Harbor	B	5	18070304	90810000	132	Acres	Copper	Metals/Metalloids	List on 303(d) list (TMDL required list)	5A	2019			
9	Regional Board 9 - San Diego Region	San Diego Bay Shoreline, at Marriott Marina	CAB908210002002030710241 0	Bay & Harbor	B	5	18070304	90821000	24	Acres	Copper	Metals/Metalloids	List on 303(d) list (TMDL required list)	5A	2019			
9	Regional Board 9 - San Diego Region	San Diego Bay Shoreline, at Spanish Landing	CAB908210002004120918125 4	Bay & Harbor	B	5	18070304	90821000	47	Acres	Total Coliform	Pathogens	List on 303(d) list (TMDL required list)	5A	2021			
9	Regional Board 9 - San Diego Region	San Diego Bay Shoreline, between Sampson and 28th Streets	CAB908220002002101508291 6	Bay & Harbor	B	4b	18070304	90822000	53	Acres	Copper	Metals/Metalloids	List on 303(d) list (being addressed by action other than TMDL)	5C		2015		
9	Regional Board 9 - San Diego Region	San Diego Bay Shoreline, between Sampson and 28th Streets	CAB908220002002101508291 6	Bay & Harbor	B	4b	18070304	90822000	53	Acres	Mercury	Metals/Metalloids	List on 303(d) list (being addressed by action other than TMDL)	5C		2013		
9	Regional Board 9 - San Diego Region	San Diego Bay Shoreline, between Sampson and 28th Streets	CAB908220002002101508291 6	Bay & Harbor	B	4b	18070304	90822000	53	Acres	PAHs (Polycyclic Aromatic Hydrocarbons)	Other Organics	List on 303(d) list (being addressed by action other than TMDL)	5C		2013		
9	Regional Board 9 - San Diego Region	San Diego Bay Shoreline, between Sampson and 28th Streets	CAB908220002002101508291 6	Bay & Harbor	B	4b	18070304	90822000	53	Acres	PCBs (Polychlorinated biphenyls)	Other Organics	List on 303(d) list (being addressed by action other than TMDL)	5C		2013		
9	Regional Board 9 - San Diego Region	San Diego Bay Shoreline, between Sampson and 28th Streets	CAB908220002002101508291 6	Bay & Harbor	B	4b	18070304	90822000	53	Acres	Zinc	Metals/Metalloids	List on 303(d) list (being addressed by action other than TMDL)	5C		2013		
9	Regional Board 9 - San Diego Region	San Diego Bay Shoreline, near Chollas Creek	CAB908220001999021010283 1	Bay & Harbor	B	5	18070304	90822000	15	Acres	Benthic Community Effects	Miscellaneous	List on 303(d) list (TMDL required list)	5A	2010			
9	Regional Board 9 - San Diego Region	San Diego Bay Shoreline, near Chollas Creek	CAB908220001999021010283 1	Bay & Harbor	B	5	18070304	90822000	15	Acres	Sediment Toxicity	Toxicity	List on 303(d) list (TMDL required list)	5A	2010			
9	Regional Board 9 - San Diego Region	San Diego Bay Shoreline, near Coronado Bridge	CAB908220002002101508222 3	Bay & Harbor	B	5	18070304	90822000	37	Acres	Benthic Community Effects	Miscellaneous	List on 303(d) list (TMDL required list)	5A	2019			
9	Regional Board 9 - San Diego Region	San Diego Bay Shoreline, near Coronado Bridge	CAB908220002002101508222 3	Bay & Harbor	B	5	18070304	90822000	37	Acres	Sediment Toxicity	Toxicity	List on 303(d) list (TMDL required list)	5A	2019			Includes Crosby Street/Cesar Chavez Park area, that will receive additional monitoring.
9	Regional Board 9 - San Diego Region	San Diego Bay Shoreline, near Switzer Creek	CAB908210001999021009382 2	Bay & Harbor	B	5	18070304	90821000	5.5	Acres	Chlordane	Pesticides	List on 303(d) list (TMDL required list)	5A	2019			
9	Regional Board 9 - San Diego Region	San Diego Bay Shoreline, near Switzer Creek	CAB908210001999021009382 2	Bay & Harbor	B	5	18070304	90821000	5.5	Acres	PAHs (Polycyclic Aromatic Hydrocarbons)	Other Organics	List on 303(d) list (TMDL required list)	5A	2019			
9	Regional Board 9 - San Diego Region	San Diego Bay Shoreline, near sub base	CAB908100001999021008550 7	Bay & Harbor	B	5	18070304	90810000	16	Acres	Benthic Community Effects	Miscellaneous	Do Not Delist from 303(d) list (TMDL required list)	5A	2021			There is not an expected TMDL completion date because the TMDL is for the waterbody and pollutant and the TMDL can not be completed for benthic community effects alone.
9	Regional Board 9 - San Diego Region	San Diego Bay Shoreline, near sub base	CAB908100001999021008550 7	Bay & Harbor	B	5	18070304	90810000	16	Acres	Sediment Toxicity	Toxicity	Do Not Delist from 303(d) list (TMDL required list)	5A	2019			
9	Regional Board 9 - San Diego Region	San Diego Bay Shoreline, near sub base	CAB908100001999021008550 7	Bay & Harbor	B	5	18070304	90810000	16	Acres	Toxicity	Toxicity	Do Not Delist from 303(d) list (TMDL required list)	5A	2021			
9	Regional Board 9 - San Diego Region	San Diego Bay, Shelter Island Yacht Basin	CAB908100001999021009103 4	Bay & Harbor	B	4a	18070304	90810000	154	Acres	Copper, Dissolved	Metals/Metalloids	List on 303(d) list (being addressed by USEPA approved TMDL)	5B			1/1/2003	
9	Regional Board 9 - San Diego Region	San Diego River (Lower)	CAR907110002001102510160 6	River & Stream	R	5	18070304	90711000	16	Miles	Enterococcus	Pathogens	List on 303(d) list (TMDL required list)	5A	2021			
9	Regional Board 9 - San Diego Region	San Diego River (Lower)	CAR907110002001102510160 6	River & Stream	R	5	18070304	90711000	16	Miles	Fecal Coliform	Pathogens	Do Not Delist from 303(d) list (TMDL required list)	5A	2009			Lower 6 miles.
9	Regional Board 9 - San Diego Region	San Diego River (Lower)	CAR907110002001102510160 6	River & Stream	R	5	18070304	90711000	16	Miles	Low Dissolved Oxygen	Nutrients	List on 303(d) list (TMDL required list)	5A	2019			Impairment transcends adjacent Calwater watershed 90712.
9	Regional Board 9 - San Diego River (Lower)	San Diego River (Lower)	CAR907110002001102510160 6	River & Stream	R	5	18070304	90711000	16	Miles	Manganese	Metals/Metalloids	List on 303(d) list (TMDL required list)	5A	2021			
9	Regional Board 9 - San Diego River (Lower)	San Diego River (Lower)	CAR907110002001102510160 6	River & Stream	R	5	18070304	90711000	16	Miles	Nitrogen	Nutrients	List on 303(d) list (TMDL required list)	5A	2021			
9	Regional Board 9 - San Diego River (Lower)	San Diego River (Lower)	CAR907110002001102510160 6	River & Stream	R	5	18070304	90711000	16	Miles	Phosphorus	Nutrients	List on 303(d) list (TMDL required list)	5A	2019			Impairment transcends adjacent Calwater watershed 90712.
9	Regional Board 9 - San Diego River (Lower)	San Diego River (Lower)	CAR907110002001102510160 6	River & Stream	R	5	18070304	90711000	16	Miles	Total Dissolved Solids	Salinity	List on 303(d) list (TMDL required list)	5A	2019			Impairment transcends adjacent Calwater watershed 90712.
9	Regional Board 9 - San Diego River (Lower)	San Diego River (Lower)	CAR907110002001102510160 6	River & Stream	R	5	18070304	90711000	16	Miles	Toxicity	Toxicity	List on 303(d) list (TMDL required list)	5A	2021			
9	Regional Board 9 - San Diego Region	San Dieguito River	CAR905110002008082509083 0	River & Stream	R	5	18070304	90511000	19	Miles	Enterococcus	Pathogens	List on 303(d) list (TMDL required list)	5A	2021			
9	Regional Board 9 - San Diego Region	San Dieguito River	CAR905110002008082509083 0	River & Stream	R	5	18070304	90511000	19	Miles	Fecal Coliform	Pathogens	List on 303(d) list (TMDL required list)	5A	2021			
9	Regional Board 9 - San Diego Region	San Dieguito River	CAR905110002008082509083 0	River & Stream	R	5	18070304	90511000	19	Miles	Nitrogen	Nutrients	List on 303(d) list (TMDL required list)	5A	2021			
9	Regional Board 9 - San Diego Region	San Dieguito River	CAR905110002008082509083 0	River & Stream	R	5	18070304	90511000	19	Miles	Phosphorus	Nutrients	List on 303(d) list (TMDL required list)	5A	2021			
9	Regional Board 9 - San Diego Region	San Dieguito River	CAR905110002008082509083 0	River & Stream	R	5	18070304	90511000	19	Miles	Total Dissolved Solids	Salinity	List on 303(d) list (TMDL required list)	5A	2021			
9	Regional Board 9 - San Diego Region	San Dieguito River	CAR905110002008082509083 0	River & Stream	R	5	18070304	90511000	19	Miles	Toxicity	Toxicity	List on 303(d) list (TMDL required list)	5A	2021			
9	Regional Board 9 - San Diego Region	San Elijo Lagoon	CAE904610001999020916192 7	Estuary	E	5	18070303	90461000	566	Acres	Eutrophic	Nutrients	List on 303(d) list (TMDL required list)	5A	2019			Estimated size of impairment is 330 acres.
9	Regional Board 9 - San Diego Region	San Elijo Lagoon	CAE904610001999020916192 7	Estuary	E	5	18070303	90461000	566	Acres	Indicator Bacteria	Pathogens	List on 303(d) list (TMDL required list)	5A	2015			Estimated size of impairment is 150 acres.
9	Regional Board 9 - San Diego Region	San Elijo Lagoon	CAE904610001999020916192 7	Estuary	E	5	18070303	90461000	566	Acres	Sedimentation/Siltation	Sediment	List on 303(d) list (TMDL required list)	5A	2019			Estimated size of impairment is 150 acres.
9	Regional Board 9 - San Diego Region	San Juan Creek	CAR901200002001102510382 8	River & Stream	R	5	18070301	90120000	1.0	Miles	DDE (Dichlorodiphenyldichloroethylene)	Pesticides	List on 303(d) list (TMDL required list)	5A	2019			
9	Regional Board 9 - San Diego Region	San Juan Creek	CAR901200002001102510382 8	River & Stream	R	5	18070301	90120000	1.0	Miles	Indicator Bacteria	Pathogens	List on 303(d) list (TMDL required list)	5A	2019			
9	Regional Board 9 - San Diego Region	San Juan Creek	CAR901200002001102510382 8	River & Stream	R	5	18070301	90120000	1.0	Miles	Phosphorus	Nutrients	List on 303(d) list (TMDL required list)	5A	2021			
9	Regional Board 9 - San Diego Region	San Juan Creek	CAR901200002001102510382 8	River & Stream	R	5	18070301	90120000	1.0	Miles	Selenium	Metals/Metalloids	List on 303(d) list (TMDL required list)	5A	2021			
9	Regional Board 9 - San Diego Region	San Juan Creek	CAR901200002001102510382 8	River & Stream	R	5	18070301	90120000	1.0	Miles	Total Nitrogen as N	Nutrients	List on 303(d) list (TMDL required list)	5A	2021			
9	Regional Board 9 - San Diego Region	San Juan Creek	CAR901200002001102510382 8	River & Stream	R	5	18070301	90120000	1.0	Miles	Toxicity	Toxicity	List on 303(d) list (TMDL required list)	5A	2021			
9	Regional Board 9 - San Diego Region	San Juan Creek (mouth)	CAE901200001999020815045 7	Estuary	E	5	18070301	90120000	6.3	Acres	Indicator Bacteria	Pathogens	List on 303(d) list (TMDL required list)	5A	2008			
9	Regional Board 9 - San Diego Region	San Luis Rey River, Lower (west of Interstate 15)	CAR903110002001100510432 7	River & Stream	R	5	18070303	90311000	19	Miles	Chloride	Salinity	List on 303(d) list (TMDL required list)	5A	2019			Impairment located at lower 13 miles.
9	Regional Board 9 - San Diego Region	San Luis Rey River, Lower (west of Interstate 15)	CAR903110002001100510432 7	River & Stream	R	5	18070303	90311000	19	Miles	Enterococcus	Pathogens	List on 303(d) list (TMDL required list)	5A	2021			
9	Regional Board 9 - San Diego Region	San Luis Rey River, Lower (west of Interstate 15)	CAR903110002001100510432 7	River & Stream	R	5	18070303	90311000	19	Miles	Fecal Coliform	Pathogens	List on 303(d) list (TMDL required list)	5A	2021			
9	Regional Board 9 - San Diego Region	San Luis Rey River, Lower (west of Interstate 15)	CAR903110002001100510432 7	River & Stream	R	5	18070303	90311000	19	Miles	Phosphorus	Nutrients	List on 303(d) list (TMDL required list)	5A	2021			
9	Regional Board 9 - San Diego Region	San Luis Rey River, Lower (west of Interstate 15)	CAR903110002001100510432 7	River & Stream	R	5	18070303	90311000	19	Miles	Total Dissolved Solids	Salinity	List on 303(d) list (TMDL required list)	5A	2019			
9	Regional Board 9 - San Diego Region	San Luis Rey River, Lower (west of Interstate 15)	CAR903110002001100510432 7	River & Stream	R	5	18070303	90311000	19	Miles	Total Nitrogen as N	Nutrients	List on 303(d) list (TMDL required list)	5A	2021			
9	Regional Board 9 - San Diego Region	San Luis Rey River, Lower (west of Interstate 15)	CAR903110002001100510432 7	River & Stream	R	5	18070303	90311000	19	Miles	Toxicity	Toxicity	List on 303(d) list (TMDL required list)	5A	2021			
9	Regional Board 9 - San Diego Region	San Luis Rey River, Upper (east of Interstate 15)	CAR903120002009102916380 8	River & Stream	R	5	18070303	90312000	35	Miles	Total Nitrogen as N	Nutrients	List on 303(d) list (TMDL required list)	5A	2021			
9	Regional Board 9 - San Diego Region	San Marcos Creek	CAR904510002001102513292 5	River & Stream	R	5	18070303	90451000	19	Miles	DDE (Dichlorodiphenyldichloroethylene)	Pesticides	List on 303(d) list (TMDL required list)	5A	2019			
9	Regional Board 9 - San Diego Region	San Marcos Creek	CAR904510002001102513292 5	River & Stream	R	5	18070303	90451000	19	Miles	Phosphorus	Nutrients	List on 303(d) list (TMDL required list)	5A	2019			
9	Regional Board 9 - San Diego Region	San Marcos Creek	CAR904510002001102513292 5	River & Stream	R	5	18070303	90451000	19	Miles	Sediment Toxicity	Toxicity	Do Not Delist from 303(d) list (TMDL required list)	5A	2019			
9	Regional Board 9 - San Diego Region	San Marcos Creek	CAR904510002001102513292 5	River & Stream	R	5	18070303	90451000	19	Miles	Selenium	Metals/Metalloids	List on 303(d) list (TMDL required list)	5A	2021			
9	Regional Board 9 - San Diego Region	San Marcos Lake	CAL904520001999117152408	Lake & Reservoir	L	5	18070303	90452000	17	Acres	Ammonia as Nitrogen	Nutrients	List on 303(d) list (TMDL required list)	5A	2019			
9	Regional Board 9 - San Diego Region	San Marcos Lake	CAL904520001999117152408	Lake & Reservoir	L	5	18070303	90452000	17	Acres	Nutrients	Nutrients	List on 303(d) list (TMDL required list)	5A	2019			
9	Regional Board 9 - San Diego Region	San Vicente Creek (San Diego County)	CAR907220002008121015555 1	River & Stream	R	5	18070304	90722000	16	Miles	Ammonia as Nitrogen	Nutrients	List on 303(d) list (TMDL required list)	5A	2021			
9	Regional Board 9 - San Diego Region	San Vicente Creek (San Diego County)	CAR907220002008121015555 1	River & Stream	R	5	18070304	90722000	16	Miles	Benthic Community Effects	Miscellaneous	List on 303(d) list (TMDL required list)	5A	2021			
9	Regional Board 9 - San Diego Region	San Vicente Creek (San Diego County)	CAR907220002008121015555 1	River & Stream	R	5	18070304	90722000	16	Miles	Total Nitrogen as N	Nutrients	List on 303(d) list (TMDL required list)	5A	2021			
9	Regional Board 9 - San Diego Region	San Vicente Creek (San Diego County)	CAR907220002008121015555 1	River & Stream	R	5	18070304	90722000	16	Miles	Toxicity	Toxicity	List on 303(d) list (TMDL required list)	5A	2021			
9	Regional Board 9 - San Diego Region	San Vicente Reservoir	CAL907210002001102509302 9	Lake & Reservoir	L	5	18070304	90721000	1058	Acres	Chloride	Salinity	List on 303(d) list (TMDL required list)	5A	2019			
9	Regional Board 9 - San Diego Region	San Vicente Reservoir	CAL907210002001102509302 9	Lake & Reservoir	L	5	18070304	90721000	1058	Acres	Color	Nuisance	List on 303(d) list (TMDL required list)	5A	2019			

2010 California 303(d) List of Water Quality Limited Segments*

Water quality limited segments requiring a TMDL(5A), being addressed by TMDL(5B), and/or being addressed by an action other than TMDL(5C).

REGION	REGION NAME	WATER BODY NAME	WBID	WATER BODY TYPE	WBTYPE CODE	INTEGRATED REPORT CATEGORY	USGS CATALOGING UNIT*	CALWATER WATERSHED	ESTIMATED SIZE AFFECTED	UNIT	POLLUTANT	POLLUTANT CATEGORY	FINAL LISTING DECISION	TMDL REQUIREMENT STATUS**	EXPECTED TMDL COMPLETION DATE***	EXPECTED ATTAINMENT DATE***	USEPA TMDL APPROVED DATE***	COMMENTS INCLUDED ON 303(d) LIST
9	Regional Board 9 - San Diego Region	San Vicente Reservoir	CAL9072100020011025093029	Lake & Reservoir	L	5	18070304	90721000	1058	Acres	Sulfates	Other Inorganics	List on 303(d) list (TMDL required list)	5A	2019			
9	Regional Board 9 - San Diego Region	San Vicente Reservoir	CAL9072100020011025093029	Lake & Reservoir	L	5	18070304	90721000	1058	Acres	Total Nitrogen as N	Nutrients	List on 303(d) list (TMDL required list)	5A	2021			
9	Regional Board 9 - San Diego Region	San Vicente Reservoir	CAL9072100020011025093029	Lake & Reservoir	L	5	18070304	90721000	1058	Acres	pH (high)	Miscellaneous	List on 303(d) list (TMDL required list)	5A	2019			
9	Regional Board 9 - San Diego Region	Sandia Creek	CAR9022200019991117132333	River & Stream	R	5	18070302	90222000	1.5	Miles	Iron	Metals/Metalloids	List on 303(d) list (TMDL required list)	5A	2019			
9	Regional Board 9 - San Diego Region	Sandia Creek	CAR9022200019991117132333	River & Stream	R	5	18070302	90222000	1.5	Miles	Sulfates	Other Inorganics	List on 303(d) list (TMDL required list)	5A	2019			
	Regional Board 9 - San Diego Region	Sandia Creek	CAR9022200019991117132333	River & Stream	R	5	18070302	90222000	1.5	Miles	Total Dissolved Solids	Salinity	Do Not Delist from 303(d) list (TMDL required list)	5A	2019			
9	Regional Board 9 - San Diego Region	Santa Gertrudis Creek	CAR9024200020080825001546	River & Stream	R	5	18070302	90242000	12	Miles	Chlorpyrifos	Pesticides	List on 303(d) list (TMDL required list)	5A	2021			
9	Regional Board 9 - San Diego Region	Santa Gertrudis Creek	CAR9024200020080825001546	River & Stream	R	5	18070302	90242000	12	Miles	Copper	Metals/Metalloids	List on 303(d) list (TMDL required list)	5A	2021			
9	Regional Board 9 - San Diego Region	Santa Gertrudis Creek	CAR9024200020080825001546	River & Stream	R	5	18070302	90242000	12	Miles	Escherichia coli (E. coli)	Pathogens	List on 303(d) list (TMDL required list)	5A	2021			
9	Regional Board 9 - San Diego Region	Santa Gertrudis Creek	CAR9024200020080825001546	River & Stream	R	5	18070302	90242000	12	Miles	Fecal Coliform	Pathogens	List on 303(d) list (TMDL required list)	5A	2021			
9	Regional Board 9 - San Diego Region	Santa Gertrudis Creek	CAR9024200020080825001546	River & Stream	R	5	18070302	90242000	12	Miles	Iron	Metals/Metalloids	List on 303(d) list (TMDL required list)	5A	2021			
9	Regional Board 9 - San Diego Region	Santa Gertrudis Creek	CAR9024200020080825001546	River & Stream	R	5	18070302	90242000	12	Miles	Manganese	Metals/Metalloids	List on 303(d) list (TMDL required list)	5A	2021			
9	Regional Board 9 - San Diego Region	Santa Gertrudis Creek	CAR9024200020080825001546	River & Stream	R	5	18070302	90242000	12	Miles	Phosphorus	Nutrients	List on 303(d) list (TMDL required list)	5A	2021			
9	Regional Board 9 - San Diego Region	Santa Margarita Lagoon	CAE9021100019990209155924	Estuary	E	5	18070302	90211000	28	Acres	Eutrophic	Nutrients	List on 303(d) list (TMDL required list)	5A	2019			
9	Regional Board 9 - San Diego Region	Santa Margarita River (Lower)	CAR9021100019980911161346	River & Stream	R	5	18070302	90211000	19	Miles	Enterococcus	Pathogens	List on 303(d) list (TMDL required list)	5A	2021			
9	Regional Board 9 - San Diego Region	Santa Margarita River (Lower)	CAR9021100019980911161346	River & Stream	R	5	18070302	90211000	19	Miles	Fecal Coliform	Pathogens	List on 303(d) list (TMDL required list)	5A	2021			
9	Regional Board 9 - San Diego Region	Santa Margarita River (Lower)	CAR9021100019980911161346	River & Stream	R	5	18070302	90211000	19	Miles	Phosphorus	Nutrients	List on 303(d) list (TMDL required list)	5A	2021			
9	Regional Board 9 - San Diego Region	Santa Margarita River (Lower)	CAR9021100019980911161346	River & Stream	R	5	18070302	90211000	19	Miles	Total Nitrogen as N	Nutrients	List on 303(d) list (TMDL required list)	5A	2021			
9	Regional Board 9 - San Diego Region	Santa Margarita River (Upper)	CAR9022200020011100141050	River & Stream	R	5	18070302	90222000	18	Miles	Phosphorus	Nutrients	Do Not Delist from 303(d) list (TMDL required list)	5A	2019			
9	Regional Board 9 - San Diego Region	Santa Margarita River (Upper)	CAR9022200020011100141050	River & Stream	R	5	18070302	90222000	18	Miles	Toxicity	Toxicity	List on 303(d) list (TMDL required list)	5A	2021			
9	Regional Board 9 - San Diego Region	Santa Ysabel Creek (above Sutherland Reservoir)	CAR9055300020091030161135	River & Stream	R	5	18070304	90553000	12	Miles	Toxicity	Toxicity	List on 303(d) list (TMDL required list)	5A	2021			
9	Regional Board 9 - San Diego Region	Segunda Deshecha Creek	CAR9013000020010924101553	River & Stream	R	5	18070301	90130000	0.9	Miles	Phosphorus	Nutrients	Do Not Delist from 303(d) list (TMDL required list)	5A	2019			
9	Regional Board 9 - San Diego Region	Segunda Deshecha Creek	CAR9013000020010924101553	River & Stream	R	5	18070301	90130000	0.9	Miles	Toxicity	Toxicity	List on 303(d) list (TMDL required list)	5A	2021			
9	Regional Board 9 - San Diego Region	Segunda Deshecha Creek	CAR9013000020010924101553	River & Stream	R	5	18070301	90130000	0.9	Miles	Turbidity	Sediment	List on 303(d) list (TMDL required list)	5A	2019			
9	Regional Board 9 - San Diego Region	Soledad Canyon	CAR9061000020011026104908	River & Stream	R	5	18070304	90610000	1.7	Miles	Sediment Toxicity	Toxicity	List on 303(d) list (TMDL required list)	5A	2019			
9	Regional Board 9 - San Diego Region	Soledad Canyon	CAR9061000020011026104908	River & Stream	R	5	18070304	90610000	1.7	Miles	Selenium	Metals/Metalloids	List on 303(d) list (TMDL required list)	5A	2021			
9	Regional Board 9 - San Diego Region	Sutherland Reservoir	CAL9055300020010925095919	Lake & Reservoir	L	5	18070304	90553000	561	Acres	Color	Nuisance	Do Not Delist from 303(d) list (TMDL required list)	5A	2019			
9	Regional Board 9 - San Diego Region	Sutherland Reservoir	CAL9055300020010925095919	Lake & Reservoir	L	5	18070304	90553000	561	Acres	Iron	Metals/Metalloids	List on 303(d) list (TMDL required list)	5A	2021			
9	Regional Board 9 - San Diego Region	Sutherland Reservoir	CAL9055300020010925095919	Lake & Reservoir	L	5	18070304	90553000	561	Acres	Manganese	Metals/Metalloids	List on 303(d) list (TMDL required list)	5A	2019			
9	Regional Board 9 - San Diego Region	Sutherland Reservoir	CAL9055300020010925095919	Lake & Reservoir	L	5	18070304	90553000	561	Acres	Total Nitrogen as N	Nutrients	List on 303(d) list (TMDL required list)	5A	2021			
9	Regional Board 9 - San Diego Region	Sutherland Reservoir	CAL9055300020010925095919	Lake & Reservoir	L	5	18070304	90553000	561	Acres	pH	Miscellaneous	List on 303(d) list (TMDL required list)	5A	2019			
9	Regional Board 9 - San Diego Region	Sweetwater Reservoir	CAL9092100019991117112141	Lake & Reservoir	L	5	18070304	90921000	925	Acres	Oxygen, Dissolved	Nutrients	List on 303(d) list (TMDL required list)	5A	2019			
9	Regional Board 9 - San Diego Region	Sweetwater River, Lower (below Sweetwater Reservoir)	CAR9091200020091030145725	River & Stream	R	5	18070304	90912000	5.3	Miles	Enterococcus	Pathogens	List on 303(d) list (TMDL required list)	5A	2021			
9	Regional Board 9 - San Diego Region	Sweetwater River, Lower (below Sweetwater Reservoir)	CAR9091200020091030145725	River & Stream	R	5	18070304	90912000	5.3	Miles	Fecal Coliform	Pathogens	List on 303(d) list (TMDL required list)	5A	2021			
9	Regional Board 9 - San Diego Region	Sweetwater River, Lower (below Sweetwater Reservoir)	CAR9091200020091030145725	River & Stream	R	5	18070304	90912000	5.3	Miles	Phosphorus	Nutrients	List on 303(d) list (TMDL required list)	5A	2021			
9	Regional Board 9 - San Diego Region	Sweetwater River, Lower (below Sweetwater Reservoir)	CAR9091200020091030145725	River & Stream	R	5	18070304	90912000	5.3	Miles	Selenium	Metals/Metalloids	List on 303(d) list (TMDL required list)	5A	2021			
9	Regional Board 9 - San Diego Region	Sweetwater River, Lower (below Sweetwater Reservoir)	CAR9091200020091030145725	River & Stream	R	5	18070304	90912000	5.3	Miles	Total Dissolved Solids	Salinity	List on 303(d) list (TMDL required list)	5A	2021			
9	Regional Board 9 - San Diego Region	Sweetwater River, Lower (below Sweetwater Reservoir)	CAR9091200020091030145725	River & Stream	R	5	18070304	90912000	5.3	Miles	Total Nitrogen as N	Nutrients	List on 303(d) list (TMDL required list)	5A	2021			
9	Regional Board 9 - San Diego Region	Sweetwater River, Lower (below Sweetwater Reservoir)	CAR9091200020091030145725	River & Stream	R	5	18070304	90912000	5.3	Miles	Toxicity	Toxicity	List on 303(d) list (TMDL required list)	5A	2021			
9	Regional Board 9 - San Diego Region	Switzer Creek	CAR9082200020080825092534	River & Stream	R	5	18070304	90822000	1.3	Miles	Copper	Metals/Metalloids	List on 303(d) list (TMDL required list)	5A	2021			
9	Regional Board 9 - San Diego Region	Switzer Creek	CAR9082200020080825092534	River & Stream	R	5	18070304	90822000	1.3	Miles	Lead	Metals/Metalloids	List on 303(d) list (TMDL required list)	5A	2021			
9	Regional Board 9 - San Diego Region	Switzer Creek	CAR9082200020080825092534	River & Stream	R	5	18070304	90822000	1.3	Miles	Zinc	Metals/Metalloids	List on 303(d) list (TMDL required list)	5A	2021			
9	Regional Board 9 - San Diego Region	Tecate Creek	CAR9112300020081210154839	River & Stream	R	5	18070305	91123000	1.2	Miles	Selenium	Metals/Metalloids	List on 303(d) list (TMDL required list)	5A	2021			
9	Regional Board 9 - San Diego Region	Tecolote Creek	CAR9065000019990208103941	River & Stream	R	5	18070304	90650000	6.6	Miles	Cadmium	Metals/Metalloids	List on 303(d) list (TMDL required list)	5A	2019			
9	Regional Board 9 - San Diego Region	Tecolote Creek	CAR9065000019990208103941	River & Stream	R	5	18070304	90650000	6.6	Miles	Copper	Metals/Metalloids	List on 303(d) list (TMDL required list)	5A	2019			
9	Regional Board 9 - San Diego Region	Tecolote Creek	CAR9065000019990208103941	River & Stream	R	5	18070304	90650000	6.6	Miles	Indicator Bacteria	Pathogens	List on 303(d) list (TMDL required list)	5A	2009			
9	Regional Board 9 - San Diego Region	Tecolote Creek	CAR9065000019990208103941	River & Stream	R	5	18070304	90650000	6.6	Miles	Lead	Metals/Metalloids	List on 303(d) list (TMDL required list)	5A	2019			
9	Regional Board 9 - San Diego Region	Tecolote Creek	CAR9065000019990208103941	River & Stream	R	5	18070304	90650000	6.6	Miles	Nitrogen	Nutrients	List on 303(d) list (TMDL required list)	5A	2021			
9	Regional Board 9 - San Diego Region	Tecolote Creek	CAR9065000019990208103941	River & Stream	R	5	18070304	90650000	6.6	Miles	Phosphorus	Nutrients	List on 303(d) list (TMDL required list)	5A	2019			
9	Regional Board 9 - San Diego Region	Tecolote Creek	CAR9065000019990208103941	River & Stream	R	5	18070304	90650000	6.6	Miles	Selenium	Metals/Metalloids	List on 303(d) list (TMDL required list)	5A	2021			
9	Regional Board 9 - San Diego Region	Tecolote Creek	CAR9065000019990208103941	River & Stream	R	5	18070304	90650000	6.6	Miles	Toxicity	Toxicity	List on 303(d) list (TMDL required list)	5A	2019			
9	Regional Board 9 - San Diego Region	Tecolote Creek	CAR9065000019990208103941	River & Stream	R	5	18070304	90650000	6.6	Miles	Turbidity	Sediment	List on 303(d) list (TMDL required list)	5A	2019			
9	Regional Board 9 - San Diego Region	Tecolote Creek	CAR9065000019990208103941	River & Stream	R	5	18070304	90650000	6.6	Miles	Zinc	Metals/Metalloids	List on 303(d) list (TMDL required list)	5A	2019			
9	Regional Board 9 - San Diego Region	Telegraph Canyon Creek	CAR9911000020081010151336	River & Stream	R	5	18070304	90911000	10	Miles	Selenium	Metals/Metalloids	List on 303(d) list (TMDL required list)	5A	2021			
9	Regional Board 9 - San Diego Region	Temecula Creek	CAR9025100020011025111323	River & Stream	R	5	18070302	90251000	44	Miles	Chlorpyrifos	Pesticides	List on 303(d) list (TMDL required list)	5A	2021			
9	Regional Board 9 - San Diego Region	Temecula Creek	CAR9025100020011025111323	River & Stream	R	5	18070302	90251000	44	Miles	Copper	Metals/Metalloids	List on 303(d) list (TMDL required list)	5A	2021			
9	Regional Board 9 - San Diego Region	Temecula Creek	CAR9025100020011025111323	River & Stream	R	5	18070302	90251000	44	Miles	Phosphorus	Nutrients	List on 303(d) list (TMDL required list)	5A	2019			
9	Regional Board 9 - San Diego Region	Temecula Creek	CAR9025100020011025111323	River & Stream	R	5	18070302	90251000	44	Miles	Total Dissolved Solids	Salinity	List on 303(d) list (TMDL required list)	5A	2019			
9	Regional Board 9 - San Diego Region	Temecula Creek	CAR9025100020011025111323	River & Stream	R	5	18070302	90251000	44	Miles	Toxicity	Toxicity	List on 303(d) list (TMDL required list)	5A	2021			
9	Regional Board 9 - San Diego Region	Tijuana River	CAR9111100019990208133940	River & Stream	R	5	18070305	91111000	6.0	Miles	Eutrophic	Nutrients	List on 303(d) list (TMDL required list)	5A	2019			
9	Regional Board 9 - San Diego Region	Tijuana River	CAR9111100019990208133940	River & Stream	R	5	18070305	91111000	6.0	Miles	Indicator Bacteria	Pathogens	List on 303(d) list (TMDL required list)	5A	2010			
9	Regional Board 9 - San Diego Region	Tijuana River	CAR9111100019990208133940	River & Stream	R	5	18070305	91111000	6.0	Miles	Low Dissolved Oxygen	Nutrients	List on 303(d) list (TMDL required list)	5A	2019			
9	Regional Board 9 - San Diego Region	Tijuana River	CAR9111100019990208133940	River & Stream	R	5	18070305	91111000	6.0	Miles	Pesticides	Pesticides	List on 303(d) list (TMDL required list)	5A	2019			
9	Regional Board 9 - San Diego Region	Tijuana River	CAR9111100019990208133940	River & Stream	R	5	18070305	91111000	6.0	Miles	Phosphorus	Nutrients	List on 303(d) list (TMDL required list)	5A	2021			
9	Regional Board 9 - San Diego Region	Tijuana River	CAR9111100019990208133940	River & Stream	R	5	18070305	91111000	6.0	Miles	Sedimentation/Siltation	Sediment	List on 303(d) list (TMDL required list)	5A	2021			
9	Regional Board 9 - San Diego Region	Tijuana River	CAR9111100019990208133940	River & Stream	R	5	18070305	91111000	6.0	Miles	Selenium	Metals/Metalloids	List on 303(d) list (TMDL required list)	5A	2021			
9	Regional Board 9 - San Diego Region	Tijuana River	CAR9111100019990208133940	River & Stream	R	5	18070305	91111000	6.0	Miles	Solids	Miscellaneous	List on 303(d) list (TMDL required list)	5A	2019			
9	Regional Board 9 - San Diego Region	Tijuana River	CAR9111100019990208133940	River & Stream	R	5	18070305	91111000	6.0	Miles	Surfactants (MBAS)	Other Organics	List on 303(d) list (TMDL required list)	5A	2021			
9	Regional Board 9 - San Diego Region	Tijuana River	CAR9111100019990208133940	River & Stream	R	5	18070305	91111000	6.0	Miles	Synthetic Organics	Other Organics	List on 303(d) list (TMDL required list)	5A	2019			
9	Regional Board 9 - San Diego Region	Tijuana River	CAR9111100019990208133940	River & Stream	R	5	18070305	91111000	6.0	Miles	Total Nitrogen as N	Nutrients	List on 303(d) list (TMDL required list)	5A	2021			
9	Regional Board 9 - San Diego Region	Tijuana River	CAR9111100019990208133940	River & Stream	R	5	18070305	91111000	6.0	Miles	Toxicity	Toxicity	List on 303(d) list (TMDL required list)	5A	2021			
9	Regional Board 9 - San Diego Region	Tijuana River	CAR9111100019990208133940	River & Stream	R	5	18070305	91111000	6.0	Miles	Trace Elements	Metals/Metalloids	List on 303(d) list (TMDL required list)	5A	2019			
9	Regional Board 9 - San Diego Region	Tijuana River	CAR9111100019990208133940	River & Stream	R	5	18070305	91111000	6.0	Miles	Trash	Trash	List on 303(d) list (TMDL required list)	5A	2019			
9	Regional Board 9 - San Diego Region	Tijuana River Estuary	CAE9111100019990208143032	Estuary	E	5	18070305	91111000	1319	Acres	Eutrophic	Nutrients	List on 303(d) list (TMDL required list)	5A	2019			Estimated size of impairment is 1 acre.
9	Regional Board 9 - San Diego Region	Tijuana River Estuary	CAE9111100019990208143032	Estuary	E	5	18070305	91111000	1319	Acres	Indicator Bacteria	Pathogens	List on 303(d) list (TMDL required list)	5A	2010			Estimated size of impairment is 150 acres.
9	Regional Board 9 - San Diego Region	Tijuana River Estuary	CAE9111100019990208143032	Estuary	E	5	18070305	91111000	1319	Acres	Lead	Metals/Metalloids	List on 303(d) list (TMDL required list)	5A	2019			Estimated size of impairment is 1 acre.
9	Regional Board 9 - San Diego Region	Tijuana River Estuary	CAE9111100019990208143032	Estuary	E	5	18070305	91111000	1319	Acres	Low Dissolved Oxygen	Nutrients	Do Not Delist from 303(d) list (TMDL required list)	5A	2019			
9	Regional Board 9 - San Diego Region	Tijuana River Estuary	CAE9111100019990208143032	Estuary	E	5	18070305	91111000	1319	Acres	Nickel	Metals/Metalloids	List on 303(d) list (TMDL required list)	5A	2019			Estimated size of impairment is 1 acre.
9	Regional Board 9 - San Diego Region	Tijuana River Estuary	CAE9111100019990208143032	Estuary	E	5	18070305	91111000	1319	Acres	Pesticides	Pesticides	List on 303(d) list (TMDL required list)	5A	2019			Estimated size of impairment is 1 acre.
9	Regional Board 9 - San Diego Region	Tijuana River Estuary	CAE9111100019990208143032	Estuary	E	5	18070305	91111000	1319	Acres	Thallium	Metals/Metalloids	List on 303(d) list (TMDL required list)	5A	2019			Estimated size of impairment is 1 acre.
9	Regional Board 9 - San Diego Region	Tijuana River Estuary	CAE9111100019990208143032	Estuary	E	5	18070305	91111000	1319	Acres	Trash	Trash	List on 303(d) list (TMDL required list)	5A	2019			Estimated size of impairment is 1 acre.
9	Regional Board 9 - San Diego Region	Tijuana River Estuary	CAE9111100019990208143032	Estuary	E	5	18070305	91111000	1319	Acres	Turbidity	Sediment	List on 303(d) list (TMDL required list)	5A	2019			
9	Regional Board 9 - San Diego Region	Warm Springs Creek (Riverside County)	CAR9023300020080825005933	River & Stream	R	5	18070302	90233000	15	Miles	Chlorpyrifos	Pesticides	List on 303(d) list (TMDL required list)	5A	2021			
9	Regional Board 9 - San Diego Region	Warm Springs Creek (Riverside County)	CAR9023300020080825005933	River & Stream	R	5	18070302	90233000	15	Miles	Escherichia coli (E. coli)	Pathogens	List on 303(d) list (TMDL required list)	5A	2021			
9	Regional Board 9 - San Diego Region	Warm Springs Creek (Riverside County)	CAR9023300020080825005933	River & Stream	R	5	18070302	90233000	15	Miles	Fecal Coliform	Pathogens	List on 303(d) list (TMDL required list)	5A	2021			
9	Regional Board 9 - San Diego Region	Warm Springs Creek (Riverside County)	CAR9023300020080825005933	River & Stream	R	5	18070302	90233000	15	Miles	Iron	Metals/Metalloids	List on 303(d) list (TMDL required list)	5A	2021			
9	Regional Board 9 - San Diego Region	Warm Springs Creek (Riverside County)	CAR9023300020080825005933	River & Stream	R	5	18070302	90233000	15	Miles	Manganese	Metals/Metalloids	List on 303(d) list (TMDL required list)	5A	2021			
9	Regional Board 9 - San Diego Region	Warm Springs Creek (Riverside County)	CAR9023300020080825005933	River & Stream	R	5	18070302	90233000	15	Miles	Phosphorus	Nutrients	List on 303(d) list (TMDL required list)	5A	2021			
9	Regional Board 9 - San Diego Region	Warm Springs Creek (Riverside County)	CAR9023300020080825005933	River & Stream	R	5	18070302	90233000	15	Miles	Total Nitrogen as N	Nutrients	List on 303(d) list (TMDL required list)	5A	2021			

United States Department of Agriculture

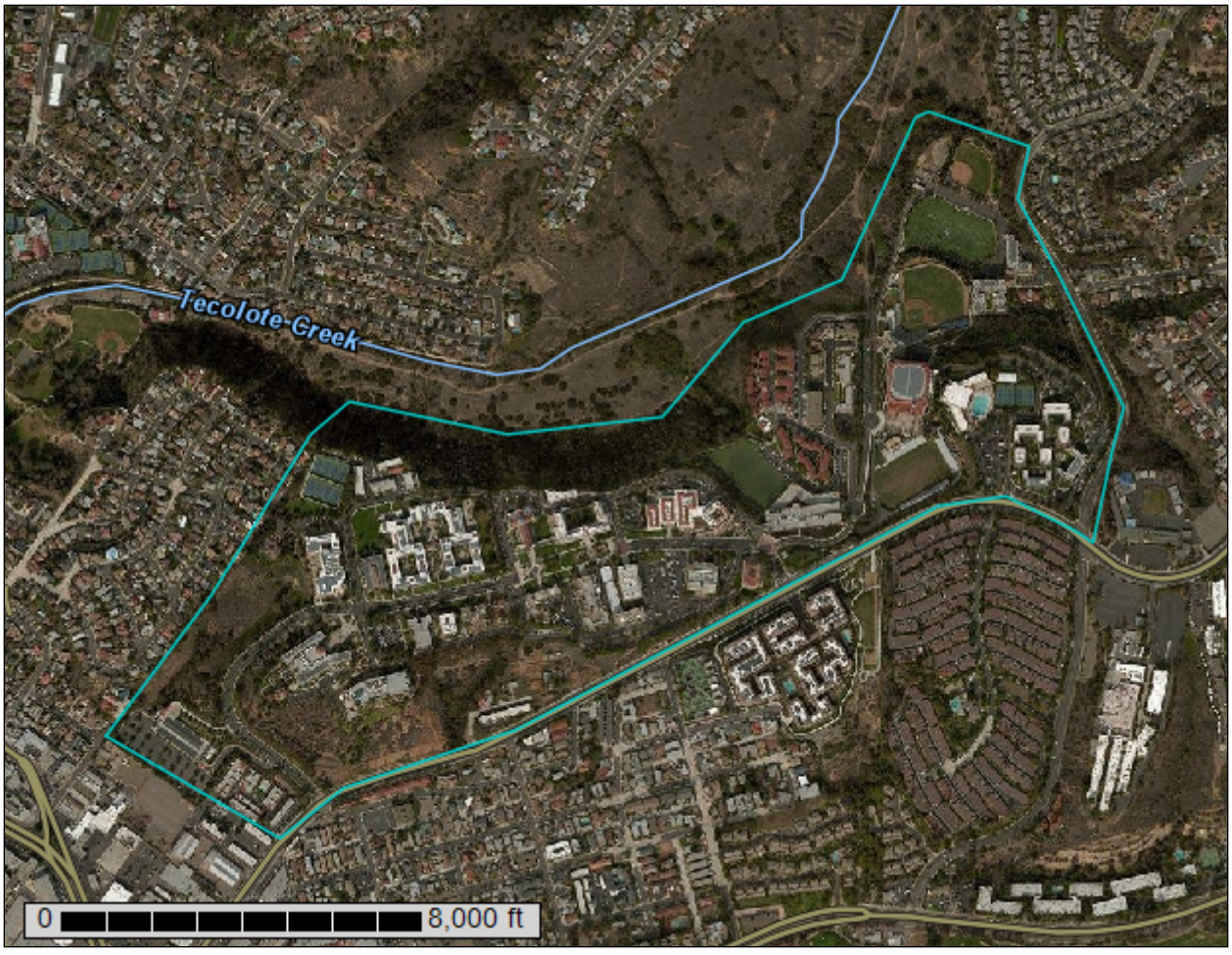
NRCS

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for San Diego County Area, California

USD



June 25, 2015

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (http://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

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How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil scientists classified and named the soils in the survey area, they compared the

individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Custom Soil Resource Report
Soil Map

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: San Diego County Area, California
Survey Area Data: Version 8, Sep 17, 2014

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Dec 7, 2014—Jan 4, 2015

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

San Diego County Area, California (CA638)			
Map Unit Symbol	**Map Unit Name**	**Acres in AOI**	**Percent of AOI**
CcC	Carlsbad-Urban land complex, 2 to 9 percent slopes	14.1	6.9%
GaF	Gaviota fine sandy loam, 30 to 50 percent slopes	12.2	6.0%
HrE2	Huerhuero loam, 15 to 30 percent slopes, eroded	18.2	8.9%
HuC	Huerhuero-Urban land complex, 2 to 9 percent slopes	28.1	13.8%
HuE	Huerhuero-Urban land complex, 9 to 30 percent slopes	48.7	23.8%
OkC	Olivenhain-Urban land complex, 2 to 9 percent slopes	51.3	25.2%
OkE	Olivenhain-Urban land complex, 9 to 30 percent slopes	0.6	0.3%
RkB	Reiff fine sandy loam, 2 to 5 percent slopes	2.5	1.2%
TeF	Terrace escarpments	28.5	13.9%
Totals for Area of Interest		**204.2**	**100.0%**

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used.

Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

San Diego County Area, California

CcC—Carlsbad-Urban land complex, 2 to 9 percent slopes

Map Unit Setting

National map unit symbol: hb9d
Elevation: 30 to 300 feet
Mean annual precipitation: 10 to 16 inches
Frost-free period: 330 to 350 days
Farmland classification: Not prime farmland

Map Unit Composition

Carlsbad and similar soils: 50 percent
Urban land: 30 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Carlsbad

Setting

Landform: Hillslopes
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Ferruginous sandstone

Typical profile

H1 - 0 to 21 inches: gravelly loamy sand
H2 - 21 to 39 inches: loamy sand
H3 - 39 to 50 inches: indurated

Properties and qualities

Slope: 2 to 9 percent
Depth to restrictive feature: 24 to 40 inches to duripan
Natural drainage class: Moderately well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Very low (about 2.7 inches)

Interpretive groups

Land capability classification (irrigated): 4e
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: B

Description of Urban Land

Typical profile

H1 - 0 to 6 inches: variable

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 8

Minor Components

Tujunga

Percent of map unit: 10 percent

GaF—Gaviota fine sandy loam, 30 to 50 percent slopes

Map Unit Setting

National map unit symbol: hbc7
Elevation: 100 to 4,000 feet
Mean annual precipitation: 20 inches
Mean annual air temperature: 61 degrees F
Farmland classification: Not prime farmland

Map Unit Composition

Gaviota and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Gaviota

Setting

Landform: Hillslopes
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Residuum weathered from calcareous sandstone

Typical profile

H1 - 0 to 16 inches: fine sandy loam
H2 - 16 to 20 inches: unweathered bedrock

Properties and qualities

Slope: 30 to 50 percent
Depth to restrictive feature: 10 to 20 inches to lithic bedrock
Natural drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Very low (about 1.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: D
Ecological site: SHALLOW LOAMY (1975) (R019XD060CA)

Minor Components

Linne
Percent of map unit: 10 percent

Diablo
Percent of map unit: 3 percent

Huerhuero
Percent of map unit: 2 percent

HrE2—Huerhuero loam, 15 to 30 percent slopes, eroded

Map Unit Setting
National map unit symbol: hbcr
Elevation: 1,100 feet
Mean annual precipitation: 12 to 20 inches
Mean annual air temperature: 57 degrees F
Frost-free period: 260 days
Farmland classification: Not prime farmland

Map Unit Composition
Huerhuero and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Huerhuero

Setting
Landform: Marine terraces
Down-slope shape: Concave
Across-slope shape: Linear
Parent material: Calcareous alluvium derived from sedimentary rock

Typical profile
H1 - 0 to 10 inches: loam
H2 - 10 to 50 inches: clay loam, clay
H2 - 10 to 50 inches: stratified sand to sandy loam
H3 - 50 to 60 inches:

Properties and qualities
Slope: 15 to 30 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Moderately well drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)

Sodium adsorption ratio, maximum in profile: 25.0
Available water storage in profile: Moderate (about 6.5 inches)

Interpretive groups
Land capability classification (irrigated): 6e
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: D
Ecological site: CLAYPAN (1975) (R019XD061CA)

Minor Components

Las flores
Percent of map unit: 10 percent

Loamy alluvial land
Percent of map unit: 3 percent

Oliventain
Percent of map unit: 2 percent

HuC—Huerhuero-Urban land complex, 2 to 9 percent slopes

Map Unit Setting
National map unit symbol: hbcs
Elevation: 1,100 feet
Mean annual precipitation: 12 to 20 inches
Mean annual air temperature: 57 degrees F
Frost-free period: 260 days
Farmland classification: Not prime farmland

Map Unit Composition
Huerhuero and similar soils: 50 percent
Urban land: 30 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Huerhuero

Setting
Landform: Marine terraces
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Calcareous alluvium derived from sedimentary rock

Typical profile
H1 - 0 to 12 inches: loam
H2 - 12 to 55 inches: clay loam, clay
H2 - 12 to 55 inches: stratified sand to sandy loam
H3 - 55 to 72 inches:

Properties and qualities
Slope: 2 to 9 percent

Depth to restrictive feature: More than 80 inches
Natural drainage class: Moderately well drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 25.0
Available water storage in profile: Moderate (about 6.6 inches)

Interpretive groups

Land capability classification (irrigated): 4e
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: D

Description of Urban Land

Typical profile

H1 - 0 to 6 inches: variable

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 8

Minor Components

Las flores

Percent of map unit: 10 percent

Oliventain

Percent of map unit: 5 percent

HuE—Huerhuero-Urban land complex, 9 to 30 percent slopes

Map Unit Setting

National map unit symbol: hbct
Elevation: 1,100 feet
Mean annual precipitation: 12 to 20 inches
Mean annual air temperature: 57 degrees F
Frost-free period: 260 days
Farmland classification: Not prime farmland

Map Unit Composition

Huerhuero and similar soils: 50 percent
Urban land: 30 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Huerhuero

Setting

Landform: Marine terraces
Down-slope shape: Concave
Across-slope shape: Linear
Parent material: Calcareous alluvium derived from sedimentary rock

Typical profile

H1 - 0 to 10 inches: loam
H2 - 10 to 50 inches: clay loam, clay
H2 - 10 to 50 inches: stratified sand to sandy loam
H3 - 50 to 60 inches:

Properties and qualities

Slope: 15 to 30 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Moderately well drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 25.0
Available water storage in profile: Moderate (about 6.5 inches)

Interpretive groups

Land capability classification (irrigated): 6e
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: D

Description of Urban Land

Typical profile

H1 - 0 to 6 inches: variable

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 8

OkC—Olivenhain-Urban land complex, 2 to 9 percent slopes

Map Unit Setting

National map unit symbol: hbff
Elevation: 100 to 600 feet
Mean annual precipitation: 14 inches
Mean annual air temperature: 63 degrees F
Frost-free period: 290 to 330 days
Farmland classification: Not prime farmland

Map Unit Composition

Olivenhain and similar soils: 50 percent
Urban land: 30 percent
Minor components: 6 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Olivenhain

Setting

Landform: Marine terraces
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Gravelly alluvium derived from mixed sources

Typical profile

H1 - 0 to 10 inches: cobbly loam
H2 - 10 to 42 inches: very cobbly clay, very cobbly clay loam
H2 - 10 to 42 inches: cobbly loam, cobbly clay loam
H3 - 42 to 60 inches:
H3 - 42 to 60 inches:

Properties and qualities

Slope: 2 to 9 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Moderate (about 8.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: D

Description of Urban Land

Typical profile

H1 - 0 to 6 inches: variable

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 8

Minor Components

Huerhuero

Percent of map unit: 2 percent

Diablo

Percent of map unit: 2 percent

Linne

Percent of map unit: 2 percent

OkE—Olivenhain-Urban land complex, 9 to 30 percent slopes

Map Unit Setting

National map unit symbol: hbfg
Elevation: 100 to 600 feet
Mean annual precipitation: 14 inches
Mean annual air temperature: 63 degrees F
Frost-free period: 290 to 330 days
Farmland classification: Not prime farmland

Map Unit Composition

Olivenhain and similar soils: 50 percent
Urban land: 30 percent
Minor components: 6 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Olivenhain

Setting

Landform: Marine terraces
Down-slope shape: Concave
Across-slope shape: Convex
Parent material: Gravelly alluvium derived from mixed sources

Typical profile

H1 - 0 to 10 inches: cobbly loam
H2 - 10 to 42 inches: very cobbly clay, very cobbly clay loam
H2 - 10 to 42 inches: cobbly loam, cobbly clay loam
H3 - 42 to 60 inches:
H3 - 42 to 60 inches:

Properties and qualities

Slope: 9 to 30 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Moderate (about 8.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: D

Description of Urban Land

Typical profile
H1 - 0 to 6 inches: variable

Interpretive groups
Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 8

Minor Components

Huerhuero
Percent of map unit: 2 percent

Diablo
Percent of map unit: 2 percent

Linne
Percent of map unit: 2 percent

RkB—Reiff fine sandy loam, 2 to 5 percent slopes

Map Unit Setting
National map unit symbol: hbg4
Elevation: 30 to 500 feet
Mean annual precipitation: 10 to 20 inches
Mean annual air temperature: 61 to 63 degrees F
Frost-free period: 240 to 275 days
Farmland classification: Prime farmland if irrigated

Map Unit Composition
Reiff and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Reiff

Setting
Landform: Alluvial fans
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope, rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Alluvium derived from granite

Typical profile
H1 - 0 to 14 inches: fine sandy loam
H2 - 14 to 43 inches: stratified sandy loam to loam
H3 - 43 to 60 inches: stratified sandy loam to loam

Properties and qualities

Slope: 2 to 5 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water storage in profile: Moderate (about 8.6 inches)

Interpretive groups

Land capability classification (irrigated): 2e
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: A

Minor Components

Visalia

Percent of map unit: 5 percent

Ramona

Percent of map unit: 5 percent

Plecentia

Percent of map unit: 5 percent

TeF—Terrace escarpments

Map Unit Composition

Terrace escarpments: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Terrace Escarpments

Setting

Landform: Escarpments
Landform position (three-dimensional): Riser

Typical profile

H1 - 0 to 60 inches: variable

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 8

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Appendix D Pollutant Control & HMP Calculations

Note: To identify the largest possible surface area of the Pollutant Control facilities, they were identified and preliminarily sized as lined bio-filtration basins (i.e Flow-Through Planters using the BMP Sizing Spreadsheet (source projectcleanwater.org). These basins are preliminarily large enough to treat store runoff in accordance with treatment and flow control requirements. Ultimately, final Pollutant Control and Hydromodification Management Facilities will be selected at the time of Substantial Conformance Review (SCR) and/or ministerial permitting and may include bio-filtration plus cistern/vault subject to the City's approval of the sizing calculations.

The future project specific SWQMP shall include discussions, calculations, and exhibits addressing:

- Downstream susceptibility to erosion (i.e . low, medium or high
- Feasibility of storm water harvest and use
- Feasibility to infiltrate storm water (full or partial)
- Critical Course Sediment Yield Areas (CCSYAs)
- Exhibits identifying the Drainage Management Areas (DMAs) including the location of the BMPs
- 85^{th} percentile rainfall and resulting Design Capture Volume (DCVs)
- Orifice design details and supporting drawdown calculations

Site #	Project Description	Pervious Area (sf)	Req'd Bio-Filtration Surface Area (sf)	Req'd HMP Surface Area (sf)
Previously Approved Projects				
1	Approved as Sports Park; Tennis Center; Proposed Athletics/ Administrative/ Parking	63,000	2,394	17,592
5	Approved as Olin Hall Expansion with underground parking; Proposed Academic/Administrative Building with Parking	15,260	1,249	7,683
11	Approved as Renovation to Missions; Proposed Housing	10,400	678	4,992
Proposed Projects				
17	Proposed Trails/ Landscape Enhancements	N/A	1,906	N/A
18	Parking/Administrative/Physical Plant. 2 levels above ground.	17,325	1,225	9,252
19	Plaza/Mall/Bridge	36,800	246	1,800
20	Proposed Academic/Administrative/Support	N/A	N/A	N/A
21	Proposed Academic/Administrative/Student Support Services	4,056	511	3,774
22	New Academic/Administrative Building	70,121	2,425	17,803
23	New Housing/Parking Structure	15,542	1,640	12,111
24	New Housing/ Student Services/ Parking	12,750	819	6,035
25	Proposed Academic/ Administrative / Parking Building	5,605	809	5,973
26	Engineering Expansion of Loma Hall; Proposed Academic/Administrative Building	8,990	972	7,178
27	Housing/Student Services	39,728	1,469	10,787
28	Athletics/Administrative Support	12,443	317	2,319
29	Facilities/Athletic Support	12,810	303	2,210
30	New Student Housing/Student Services/ Parking/Athletics	35,000	2,719	20,056

Notes:

(1) Required BMP Surface Area based on Bio-filtration and HMP calculations shown in Appendix D

(2) Projects 2-4, 6-10, and 12-16 are projects previously approved as part of CUP 92-0568 and/or SCR 140192 and SCR 104281. These projects will be required to submit project specific SWQMPs.

(3) Projects 17 and 20 are considered to Standard Development Projects as defined by the City of San Diego Storm Water Standards dated January 2016 and as outlined in the Storm Water Applicability Checklist (DS-560) date February 2016.

BMP Sizing Spreadsheet V1.04

Project Name:	University of San Diego
Project Applicant:	
Jurisdiction:	
Parcel (APN):	Varies
Hydrologic Unit:	
Rain Gauge:	Lindbergh
Total Project Area (sf):	
Channel Susceptibility:	High

BMP Sizing Spreadsheet V1.04			
Project Name:	University of San Diego	Hydrologic Unit:	
Project Applicant:		Rain Gauge:	Lindbergh
Jurisdiction:		Total Project Area:	
Parcel (APN):	Varies	Low Flow Threshold:	0.1Q2
BMP Name:	PROJECT NO. 1	BMP Type:	Flow-Through Planter
BMP Native Soil Type:	D	BMP Infiltration Rate (in/hr):	0.024

Areas Draining to BMP						HMP Sizing Factors			Minimum BMP Size		
DMA Name	Area (sf)	Soil Type	Slope	Post Project Surface Type	Runoff Factor (Table 4-2)	Surface Area	Surface Volume	Subsurface Volume	Surface Area (sf)	Surface Volume (cf)	Subsurface Volume (cf)
IMPERVIOUS	81660	D	Flat	IMPERVIOUS	1.0	0.2	0.1667	0.12	16332	13613	9799
PERVIOUS	63000	D	Flat	PERVIOUS	0.1	0.2	0.1667	0.12	1260	1050	756
Total BMP Area	144660										

Minimum BMP Size	17592	14663	10555
Proposed BMP Size*	17592	14660	10555
Soil Matrix Depth		18.00	in
Minimum Ponding Depth		10.00	in
Maximum Ponding Depth			in
Selected Ponding Depth		10.00	in

Describe the BMP's in sufficient detail in your SWMP to demonstrate the area, volume, and other criteria can be met within the constraints of the site.

BMP's must be adapted and applied to the conditions specific to the development project such as unstable slopes or the lack of available head.
Designated Staff have final review and approval authority over the project design.

This Sizing Calculator has been developed in compliance with the Countywide Model SUSMP. For questions or concerns please contact the jurisdiction in which your project is located.

BMP Sizing Spreadsheet V1.04			
Project Name:	University of San Diego	Hydrologic Unit:	
Project Applicant:		Rain Gauge:	Lindbergh
Jurisdiction:		Total Project Area:	
Parcel (APN):	Varies	Low Flow Threshold:	0.1Q2
BMP Name:	PROJECT NO. 5	BMP Type:	Flow-Through Planter
BMP Native Soil Type:	D	BMP Infiltration Rate (in/hr):	0.024

Areas Draining to BMP						HMP Sizing Factors			Minimum BMP Size		
DMA Name	Area (sf)	Soil Type	Slope	Post Project Surface Type	Runoff Factor (Table 4-2)	Surface Area	Surface Volume	Subsurface Volume	Surface Area (sf)	Surface Volume (cf)	Subsurface Volume (cf)
IMPERVIOUS	44560	D	Flat	IMPERVIOUS	1.0	0.2	0.1667	0.12	8912	7428	5347
PERVIOUS	15260	D	Flat	PERVIOUS	0.1	0.2	0.1667	0.12	305	254	183
Total BMP Area	59820										

Minimum BMP Size	9217.2	7683	5530
Proposed BMP Size*	9218	7682	5531
Soil Matrix Depth		18.00	in
Minimum Ponding Depth		10.00	in
Maximum Ponding Depth			in
Selected Ponding Depth		10.00	in

Describe the BMP's in sufficient detail in your SWMP to demonstrate the area, volume, and other criteria can be met within the constraints of the site.

BMP's must be adapted and applied to the conditions specific to the development project such as unstable slopes or the lack of available head.
Designated Staff have final review and approval authority over the project design.

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BMP Sizing Spreadsheet V1.04			
Project Name:	University of San Diego	Hydrologic Unit:	
Project Applicant:		Rain Gauge:	Lindbergh
Jurisdiction:		Total Project Area:	
Parcel (APN):	Varies	Low Flow Threshold:	0.1Q2
BMP Name:	PROJECT NO. 11	BMP Type:	Flow-Through Planter
BMP Native Soil Type:	D	BMP Infiltration Rate (in/hr):	0.024

Areas Draining to BMP						HMP Sizing Factors			Minimum BMP Size		
DMA Name	Area (sf)	Soil Type	Slope	Post Project Surface Type	Runoff Factor (Table 4-2)	Surface Area	Surface Volume	Subsurface Volume	Surface Area (sf)	Surface Volume (cf)	Subsurface Volume (cf)
IMPERVIOUS	23920	D	Flat	IMPERVIOUS	1.0	0.2	0.1667	0.12	4784	3987	2870
PERVIOUS	10400	D	Flat	PERVIOUS	0.1	0.2	0.1667	0.12	208	173	125
Total BMP Area	34320										

Minimum BMP Size	4992	4161	2995
Proposed BMP Size*	4992	4160	2995
Soil Matrix Depth		18.00	in
Minimum Ponding Depth		10.00	in
Maximum Ponding Depth			in
Selected Ponding Depth		10.00	in

Describe the BMP's in sufficient detail in your SWMP to demonstrate the area, volume, and other criteria can be met within the constraints of the site.

BMP's must be adapted and applied to the conditions specific to the development project such as unstable slopes or the lack of available head.
Designated Staff have final review and approval authority over the project design.

This Sizing Calculator has been developed in compliance with the Countywide Model SUSMP. For questions or concerns please contact the jurisdiction in which your project is located.

BMP Sizing Spreadsheet V1.04			
Project Name:	University of San Diego	Hydrologic Unit:	
Project Applicant:		Rain Gauge:	Lindbergh
Jurisdiction:		Total Project Area:	
Parcel (APN):	Varies	Low Flow Threshold:	0.1Q2
BMP Name:	PROJECT NO. 17	BMP Type:	Flow-Through Planter
BMP Native Soil Type:	D	BMP Infiltration Rate (in/hr):	0.024

Areas Draining to BMP						HMP Sizing Factors			Minimum BMP Size		
DMA Name	Area (sf)	Soil Type	Slope	Post Project Surface Type	Runoff Factor (Table 4-2)	Surface Area	Surface Volume	Subsurface Volume	Surface Area (sf)	Surface Volume (cf)	Subsurface Volume (cf)
IMPERVIOUS	N/A	D	Flat	IMPERVIOUS	1.0	0.2	0.1667	0.12	#VALUE!	#VALUE!	#VALUE!
PERVIOUS	N/A	D	Flat	PERVIOUS	0.1	0.2	0.1667	0.12	#VALUE!	#VALUE!	#VALUE!
Total BMP Area								Minimum BMP Size	#VALUE!	#VALUE!	#VALUE!
								Proposed BMP Size*			
								Soil Matrix Depth		18.00	in
								Minimum Ponding Depth		N/A	in
								Maximum Ponding Depth		N/A	in
								Selected Ponding Depth		10.00	in

Describe the BMP's in sufficient detail in your SWMP to demonstrate the area, volume, and other criteria can be met within the constraints of the site.

BMP's must be adapted and applied to the conditions specific to the development project such as unstable slopes or the lack of available head.
Designated Staff have final review and approval authority over the project design.

This Sizing Calculator has been developed in compliance with the Countywide Model SUSMP. For questions or concerns please contact the jurisdiction in which your project is located.

BMP Sizing Spreadsheet V1.04			
Project Name:	University of San Diego	Hydrologic Unit:	
Project Applicant:		Rain Gauge:	Lindbergh
Jurisdiction:		Total Project Area:	
Parcel (APN):	Varies	Low Flow Threshold:	0.1Q2
BMP Name:	PROJECT NO. 18	BMP Type:	Flow-Through Planter
BMP Native Soil Type:	D	BMP Infiltration Rate (in/hr):	0.024

Areas Draining to BMP						HMP Sizing Factors			Minimum BMP Size		
DMA Name	Area (sf)	Soil Type	Slope	Post Project Surface Type	Runoff Factor (Table 4-2)	Surface Area	Surface Volume	Subsurface Volume	Surface Area (sf)	Surface Volume (cf)	Subsurface Volume (cf)
IMPERVIOUS	44525	D	Flat	IMPERVIOUS	1.0	0.2	0.1667	0.12	8905	7422	5343
PERVIOUS	17325	D	Flat	PERVIOUS	0.1	0.2	0.1667	0.12	347	289	208
Total BMP Area	61850										

Minimum BMP Size	9251.5	7711	5551
Proposed BMP Size*	9500	7917	5700
Soil Matrix Depth		18.00	in
Minimum Ponding Depth		9.74	in
Maximum Ponding Depth			in
Selected Ponding Depth		10.00	in

Describe the BMP's in sufficient detail in your SWMP to demonstrate the area, volume, and other criteria can be met within the constraints of the site.

BMP's must be adapted and applied to the conditions specific to the development project such as unstable slopes or the lack of available head.
Designated Staff have final review and approval authority over the project design.

This Sizing Calculator has been developed in compliance with the Countywide Model SUSMP. For questions or concerns please contact the jurisdiction in which your project is located.

BMP Sizing Spreadsheet V1.04			
Project Name:	University of San Diego	Hydrologic Unit:	
Project Applicant:		Rain Gauge:	Lindbergh
Jurisdiction:		Total Project Area:	
Parcel (APN):	Varies	Low Flow Threshold:	0.1Q2
BMP Name:	PROJECT NO. 19	BMP Type:	Flow-Through Planter
BMP Native Soil Type:	D	BMP Infiltration Rate (in/hr):	0.024

Areas Draining to BMP						HMP Sizing Factors			Minimum BMP Size		
DMA Name	Area (sf)	Soil Type	Slope	Post Project Surface Type	Runoff Factor (Table 4-2)	Surface Area	Surface Volume	Subsurface Volume	Surface Area (sf)	Surface Volume (cf)	Subsurface Volume (cf)
IMPERVIOUS	5000	D	Flat	IMPERVIOUS	1.0	0.2	0.1667	0.12	1000	834	600
PERVIOUS	36800	D	Flat	PERVIOUS	0.1	0.2	0.1667	0.12	736	613	442
Total BMP Area	41800										

Minimum BMP Size	1736	1447	1042
Proposed BMP Size*	1800	1500	1080
Soil Matrix Depth		18.00	in
Minimum Ponding Depth		9.65	in
Maximum Ponding Depth			in
Selected Ponding Depth		10.00	in

Describe the BMP's in sufficient detail in your SWMP to demonstrate the area, volume, and other criteria can be met within the constraints of the site.

BMP's must be adapted and applied to the conditions specific to the development project such as unstable slopes or the lack of available head.
Designated Staff have final review and approval authority over the project design.

This Sizing Calculator has been developed in compliance with the Countywide Model SUSMP. For questions or concerns please contact the jurisdiction in which your project is located.

BMP Sizing Spreadsheet V1.04			
Project Name:	University of San Diego	Hydrologic Unit:	
Project Applicant:		Rain Gauge:	Lindbergh
Jurisdiction:		Total Project Area:	
Parcel (APN):	Varies	Low Flow Threshold:	0.1Q2
BMP Name:	PROJECT NO. 20	BMP Type:	Flow-Through Planter
BMP Native Soil Type:	D	BMP Infiltration Rate (in/hr):	0.024

Areas Draining to BMP						HMP Sizing Factors			Minimum BMP Size		
DMA Name	Area (sf)	Soil Type	Slope	Post Project Surface Type	Runoff Factor (Table 4-2)	Surface Area	Surface Volume	Subsurface Volume	Surface Area (sf)	Surface Volume (cf)	Subsurface Volume (cf)
IMPERVIOUS	N/A	D	Flat	IMPERVIOUS	1.0	0.2	0.1667	0.12	#VALUE!	#VALUE!	#VALUE!
PERVIOUS	N/A	D	Flat	PERVIOUS	0.1	0.2	0.1667	0.12	#VALUE!	#VALUE!	#VALUE!
Total BMP Area								Minimum BMP Size	#VALUE!	#VALUE!	#VALUE!
								Proposed BMP Size*			
								Soil Matrix Depth		18.00	in
								Minimum Ponding Depth		N/A	in
								Maximum Ponding Depth		N/A	in
								Selected Ponding Depth		10.00	in

Describe the BMP's in sufficient detail in your SWMP to demonstrate the area, volume, and other criteria can be met within the constraints of the site.

BMP's must be adapted and applied to the conditions specific to the development project such as unstable slopes or the lack of available head.
Designated Staff have final review and approval authority over the project design.

This Sizing Calculator has been developed in compliance with the Countywide Model SUSMP. For questions or concerns please contact the jurisdiction in which your project is located.

BMP Sizing Spreadsheet V1.04			
Project Name:	University of San Diego	Hydrologic Unit:	
Project Applicant:		Rain Gauge:	Lindbergh
Jurisdiction:		Total Project Area:	
Parcel (APN):	Varies	Low Flow Threshold:	0.1Q2
BMP Name:	PROJECT NO. 21	BMP Type:	Flow-Through Planter
BMP Native Soil Type:	D	BMP Infiltration Rate (in/hr):	0.024

Areas Draining to BMP						HMP Sizing Factors			Minimum BMP Size		
DMA Name	Area (sf)	Soil Type	Slope	Post Project Surface Type	Runoff Factor (Table 4-2)	Surface Area	Surface Volume	Subsurface Volume	Surface Area (sf)	Surface Volume (cf)	Subsurface Volume (cf)
IMPERVIOUS	18464	D	Flat	IMPERVIOUS	1.0	0.2	0.1667	0.12	3693	3078	2216
PERVIOUS	4056	D	Flat	PERVIOUS	0.1	0.2	0.1667	0.12	81	68	49
Total BMP Area	22520										

Minimum BMP Size	3773.92	3146	2264
Proposed BMP Size*	3774	3145	2264
Soil Matrix Depth		18.00	in
Minimum Ponding Depth		10.00	in
Maximum Ponding Depth			in
Selected Ponding Depth		10.00	in

Describe the BMP's in sufficient detail in your SWMP to demonstrate the area, volume, and other criteria can be met within the constraints of the site.

BMP's must be adapted and applied to the conditions specific to the development project such as unstable slopes or the lack of available head.
Designated Staff have final review and approval authority over the project design.

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BMP Sizing Spreadsheet V1.04			
Project Name:	University of San Diego	Hydrologic Unit:	
Project Applicant:		Rain Gauge:	Lindbergh
Jurisdiction:		Total Project Area:	
Parcel (APN):	Varies	Low Flow Threshold:	0.1Q2
BMP Name:	PROJECT NO. 22	BMP Type:	Flow-Through Planter
BMP Native Soil Type:	D	BMP Infiltration Rate (in/hr):	0.024

Areas Draining to BMP						HMP Sizing Factors			Minimum BMP Size		
DMA Name	Area (sf)	Soil Type	Slope	Post Project Surface Type	Runoff Factor (Table 4-2)	Surface Area	Surface Volume	Subsurface Volume	Surface Area (sf)	Surface Volume (cf)	Subsurface Volume (cf)
IMPERVIOUS	82000	D	Flat	IMPERVIOUS	1.0	0.2	0.1667	0.12	16400	13669	9840
PERVIOUS	70121	D	Flat	PERVIOUS	0.1	0.2	0.1667	0.12	1402	1169	841
Total BMP Area	152121										

Minimum BMP Size	17802.42	14838	10681
Proposed BMP Size*	18000	15000	10800
Soil Matrix Depth		18.00	in
Minimum Ponding Depth		9.89	in
Maximum Ponding Depth			in
Selected Ponding Depth		10.00	in

Describe the BMP's in sufficient detail in your SWMP to demonstrate the area, volume, and other criteria can be met within the constraints of the site.

BMP's must be adapted and applied to the conditions specific to the development project such as unstable slopes or the lack of available head.
Designated Staff have final review and approval authority over the project design.

This Sizing Calculator has been developed in compliance with the Countywide Model SUSMP. For questions or concerns please contact the jurisdiction in which your project is located.

BMP Sizing Spreadsheet V1.04			
Project Name:	University of San Diego	Hydrologic Unit:	
Project Applicant:		Rain Gauge:	Lindbergh
Jurisdiction:		Total Project Area:	
Parcel (APN):	Varies	Low Flow Threshold:	0.1Q2
BMP Name:	PROJECT NO. 23	BMP Type:	Flow-Through Planter
BMP Native Soil Type:	D	BMP Infiltration Rate (in/hr):	0.024

Areas Draining to BMP						HMP Sizing Factors			Minimum BMP Size		
DMA Name	Area (sf)	Soil Type	Slope	Post Project Surface Type	Runoff Factor (Table 4-2)	Surface Area	Surface Volume	Subsurface Volume	Surface Area (sf)	Surface Volume (cf)	Subsurface Volume (cf)
IMPERVIOUS	59000	D	Flat	IMPERVIOUS	1.0	0.2	0.1667	0.12	11800	9835	7080
PERVIOUS	15542	D	Flat	PERVIOUS	0.1	0.2	0.1667	0.12	311	259	187
Total BMP Area	74542										

Minimum BMP Size	12110.84	10094	7267
Proposed BMP Size*	12500	10417	7500
Soil Matrix Depth		18.00	in
Minimum Ponding Depth		9.69	in
Maximum Ponding Depth			in
Selected Ponding Depth		10.00	in

Describe the BMP's in sufficient detail in your SWMP to demonstrate the area, volume, and other criteria can be met within the constraints of the site.

BMP's must be adapted and applied to the conditions specific to the development project such as unstable slopes or the lack of available head.
Designated Staff have final review and approval authority over the project design.

This Sizing Calculator has been developed in compliance with the Countywide Model SUSMP. For questions or concerns please contact the jurisdiction in which your project is located.

BMP Sizing Spreadsheet V1.04			
Project Name:	University of San Diego	Hydrologic Unit:	
Project Applicant:		Rain Gauge:	Lindbergh
Jurisdiction:		Total Project Area:	
Parcel (APN):	Varies	Low Flow Threshold:	0.1Q2
BMP Name:	PROJECT NO. 24	BMP Type:	Flow-Through Planter
BMP Native Soil Type:	D	BMP Infiltration Rate (in/hr):	0.024

Areas Draining to BMP						HMP Sizing Factors			Minimum BMP Size		
DMA Name	Area (sf)	Soil Type	Slope	Post Project Surface Type	Runoff Factor (Table 4-2)	Surface Area	Surface Volume	Subsurface Volume	Surface Area (sf)	Surface Volume (cf)	Subsurface Volume (cf)
IMPERVIOUS	28900	D	Flat	IMPERVIOUS	1.0	0.2	0.1667	0.12	5780	4818	3468
PERVIOUS	12750	D	Flat	PERVIOUS	0.1	0.2	0.1667	0.12	255	213	153
Total BMP Area	41650										

Minimum BMP Size	6035	5030	3621
Proposed BMP Size*	6035	5029	3621
Soil Matrix Depth		18.00	in
Minimum Ponding Depth		10.00	in
Maximum Ponding Depth			in
Selected Ponding Depth		10.00	in

Describe the BMP's in sufficient detail in your SWMP to demonstrate the area, volume, and other criteria can be met within the constraints of the site.

BMP's must be adapted and applied to the conditions specific to the development project such as unstable slopes or the lack of available head.
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BMP Sizing Spreadsheet V1.04			
Project Name:	University of San Diego	Hydrologic Unit:	
Project Applicant:		Rain Gauge:	Lindbergh
Jurisdiction:		Total Project Area:	
Parcel (APN):	Varies	Low Flow Threshold:	0.1Q2
BMP Name:	PROJECT NO. 25	BMP Type:	Flow-Through Planter
BMP Native Soil Type:	D	BMP Infiltration Rate (in/hr):	0.024

Areas Draining to BMP						HMP Sizing Factors			Minimum BMP Size		
DMA Name	Area (sf)	Soil Type	Slope	Post Project Surface Type	Runoff Factor (Table 4-2)	Surface Area	Surface Volume	Subsurface Volume	Surface Area (sf)	Surface Volume (cf)	Subsurface Volume (cf)
IMPERVIOUS	29305	D	Flat	IMPERVIOUS	1.0	0.2	0.1667	0.12	5861	4885	3517
PERVIOUS	5605	D	Flat	PERVIOUS	0.1	0.2	0.1667	0.12	112	93	67
Total BMP Area	34910										

Minimum BMP Size	5973.1	4979	3584
Proposed BMP Size*	5974	4978	3584
Soil Matrix Depth		18.00	in
Minimum Ponding Depth		10.00	in
Maximum Ponding Depth			in
Selected Ponding Depth		10.00	in

Describe the BMP's in sufficient detail in your SWMP to demonstrate the area, volume, and other criteria can be met within the constraints of the site.

BMP's must be adapted and applied to the conditions specific to the development project such as unstable slopes or the lack of available head.
Designated Staff have final review and approval authority over the project design.

This Sizing Calculator has been developed in compliance with the Countywide Model SUSMP. For questions or concerns please contact the jurisdiction in which your project is located.

BMP Sizing Spreadsheet V1.04			
Project Name:	University of San Diego	Hydrologic Unit:	
Project Applicant:		Rain Gauge:	Lindbergh
Jurisdiction:		Total Project Area:	
Parcel (APN):	Varies	Low Flow Threshold:	0.1Q2
BMP Name:	PROJECT NO. 26	BMP Type:	Flow-Through Planter
BMP Native Soil Type:	D	BMP Infiltration Rate (in/hr):	0.024

Areas Draining to BMP						HMP Sizing Factors			Minimum BMP Size		
DMA Name	Area (sf)	Soil Type	Slope	Post Project Surface Type	Runoff Factor (Table 4-2)	Surface Area	Surface Volume	Subsurface Volume	Surface Area (sf)	Surface Volume (cf)	Subsurface Volume (cf)
IMPERVIOUS	34990	D	Flat	IMPERVIOUS	1.0	0.2	0.1667	0.12	6998	5833	4199
PERVIOUS	8990	D	Flat	PERVIOUS	0.1	0.2	0.1667	0.12	180	150	108
Total BMP Area	43980										

Minimum BMP Size	7177.8	5983	4307
Proposed BMP Size*	7178	5982	4307
Soil Matrix Depth		18.00	in
Minimum Ponding Depth		10.00	in
Maximum Ponding Depth			in
Selected Ponding Depth		10.00	in

Describe the BMP's in sufficient detail in your SWMP to demonstrate the area, volume, and other criteria can be met within the constraints of the site.

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BMP Sizing Spreadsheet V1.04			
Project Name:	University of San Diego	Hydrologic Unit:	
Project Applicant:		Rain Gauge:	Lindbergh
Jurisdiction:		Total Project Area:	
Parcel (APN):	Varies	Low Flow Threshold:	0.1Q2
BMP Name:	PROJECT NO. 27	BMP Type:	Flow-Through Planter
BMP Native Soil Type:	D	BMP Infiltration Rate (in/hr):	0.024

Areas Draining to BMP						HMP Sizing Factors			Minimum BMP Size		
DMA Name	Area (sf)	Soil Type	Slope	Post Project Surface Type	Runoff Factor (Table 4-2)	Surface Area	Surface Volume	Subsurface Volume	Surface Area (sf)	Surface Volume (cf)	Subsurface Volume (cf)
IMPERVIOUS	49962	D	Flat	IMPERVIOUS	1.0	0.2	0.1667	0.12	9992	8329	5995
PERVIOUS	39728	D	Flat	PERVIOUS	0.1	0.2	0.1667	0.12	795	662	477
Total BMP Area	89690										

Minimum BMP Size	10786.96	8991	6472
Proposed BMP Size*	10787	8989	6472
Soil Matrix Depth		18.00	in
Minimum Ponding Depth		10.00	in
Maximum Ponding Depth			in
Selected Ponding Depth		10.00	in

Describe the BMP's in sufficient detail in your SWMP to demonstrate the area, volume, and other criteria can be met within the constraints of the site.

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BMP Sizing Spreadsheet V1.04			
Project Name:	University of San Diego	Hydrologic Unit:	
Project Applicant:		Rain Gauge:	Lindbergh
Jurisdiction:		Total Project Area:	
Parcel (APN):	Varies	Low Flow Threshold:	0.1Q2
BMP Name:	PROJECT NO. 28	BMP Type:	Flow-Through Planter
BMP Native Soil Type:	D	BMP Infiltration Rate (in/hr):	0.024

Areas Draining to BMP						HMP Sizing Factors			Minimum BMP Size		
DMA Name	Area (sf)	Soil Type	Slope	Post Project Surface Type	Runoff Factor (Table 4-2)	Surface Area	Surface Volume	Subsurface Volume	Surface Area (sf)	Surface Volume (cf)	Subsurface Volume (cf)
IMPERVIOUS	10348	D	Flat	IMPERVIOUS	1.0	0.2	0.1667	0.12	2070	1725	1242
PERVIOUS	12443	D	Flat	PERVIOUS	0.1	0.2	0.1667	0.12	249	207	149
Total BMP Area	22791										

Minimum BMP Size	2318.46	1932	1391
Proposed BMP Size*	2319	1933	1391
Soil Matrix Depth		18.00	in
Minimum Ponding Depth		10.00	in
Maximum Ponding Depth			in
Selected Ponding Depth		10.00	in

Describe the BMP's in sufficient detail in your SWMP to demonstrate the area, volume, and other criteria can be met within the constraints of the site.

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BMP Sizing Spreadsheet V1.04			
Project Name:	University of San Diego	Hydrologic Unit:	
Project Applicant:		Rain Gauge:	Lindbergh
Jurisdiction:		Total Project Area:	
Parcel (APN):	Varies	Low Flow Threshold:	0.1Q2
BMP Name:	PROJECT NO. 29	BMP Type:	Flow-Through Planter
BMP Native Soil Type:	D	BMP Infiltration Rate (in/hr):	0.024

Areas Draining to BMP						HMP Sizing Factors			Minimum BMP Size		
DMA Name	Area (sf)	Soil Type	Slope	Post Project Surface Type	Runoff Factor (Table 4-2)	Surface Area	Surface Volume	Subsurface Volume	Surface Area (sf)	Surface Volume (cf)	Subsurface Volume (cf)
IMPERVIOUS	9770	D	Flat	IMPERVIOUS	1.0	0.2	0.1667	0.12	1954	1629	1172
PERVIOUS	12810	D	Flat	PERVIOUS	0.1	0.2	0.1667	0.12	256	214	154
Total BMP Area	22580							Minimum BMP Size	2210.2	1842	1326
								Proposed BMP Size*	2400	2000	1440
								Soil Matrix Depth		18.00	in
								Minimum Ponding Depth		9.21	in
								Maximum Ponding Depth		N/A	in
								Selected Ponding Depth		10.00	in

Describe the BMP's in sufficient detail in your SWMP to demonstrate the area, volume, and other criteria can be met within the constraints of the site.

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BMP Sizing Spreadsheet V1.04			
Project Name:	University of San Diego	Hydrologic Unit:	
Project Applicant:		Rain Gauge:	Lindbergh
Jurisdiction:		Total Project Area:	
Parcel (APN):	Varies	Low Flow Threshold:	0.1Q2
BMP Name:	PROJECT NO. 30	BMP Type:	Flow-Through Planter
BMP Native Soil Type:	D	BMP Infiltration Rate (in/hr):	0.024

Areas Draining to BMP						HMP Sizing Factors			Minimum BMP Size		
DMA Name	Area (sf)	Soil Type	Slope	Post Project Surface Type	Runoff Factor (Table 4-2)	Surface Area	Surface Volume	Subsurface Volume	Surface Area (sf)	Surface Volume (cf)	Subsurface Volume (cf)
IMPERVIOUS	96780	D	Flat	IMPERVIOUS	1.0	0.2	0.1667	0.12	19356	16133	11614
PERVIOUS	35000	D	Flat	PERVIOUS	0.1	0.2	0.1667	0.12	700	583	420
Total BMP Area	131780										

Minimum BMP Size	20056	16717	12034
Proposed BMP Size*	20056	16713	12034
Soil Matrix Depth		18.00	in
Minimum Ponding Depth		10.00	in
Maximum Ponding Depth			in
Selected Ponding Depth		10.00	in

Describe the BMP's in sufficient detail in your SWMP to demonstrate the area, volume, and other criteria can be met within the constraints of the site.

BMP's must be adapted and applied to the conditions specific to the development project such as unstable slopes or the lack of available head.
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IMP1

Surface	Runoff Factor (C)	Area (A)	Runoff Factor (C) x Area (A)
Roofs	0.90	1.87	1.69
Concrete or Asphalt	0.90		
Unit Pavers (grouted)	0.90		
Decomposed Granite	0.30		
Cobbles or Crushed Aggregate	0.30		
Amended, Mulched Soils or Landscape	0.10	1.45	0.14
Compacted Soil (e.g., unpaved parking)	0.30		
	∑ C x A =	1.83	
	∑ A =	3.32	
	C = ∑C x A / ∑ A =	**0.55**	

IMP1

Design Capture Volume		Worksheet B-2.1		
1	85th Percentile 24-hr storm depth from Figure B.1-1	d=	0.55	inches
2	Area tributary to BMP (s)	A=	3.32	acres
3	Area weighted runoff factor (estimate using Appendix B.1.1 and B.2.1)	C=	0.55	unit-less
4	Street trees volume reduction	TCV=		cubic feet
5	Rain barrels volume reduction	RCV=		cubic feet
6	Calculate DCV = (3630 x C x d x A) - TCV - RCV	DCV=	3,658	cubic feet

IMP1

	Simple Sizing Method for Biofitration BMPs	Worksheet B.5-1	
1	Remaining DCV, after implementing retention BMPs	3,658	cubic-feet
Partial Retention			
2	Infiltration rate from Worksheet D.5.1 if partial infiltration is feasible	0	in/hr.
3	Allowable drawdown time for aggregate storage below the underdrain	36	hours
4	Depth of runoff that can be infiltrated [Line 2 x Line 3]	0	inches
5	Aggregate pore space	0.40	in/in
6	Required depth of gravel below the underdrain [Line 4 / Line 5]	0	inches
7	Assumed surface area of the biofiltraiton BMP	2,394	sq-ft
8	Media retained pore space	0.1	in/in
9	Volume retained by BMP [[Line 4 + (Line 12 x Line 8)] / 12] x Line 7	359	cubic-feet
10	DCV that requires biofiltraiton [Line 1 - Line 9]	3,299	cubic-feet
BMP Parameters			
11	Surface Ponding [6 inch minimum, 12 inch maximum]	10	inches
12	Media Thickness [18 inches minimum]	18	inches
13	Aggregate Storage above underdrain invert (12 inches typical) - use 0 inches for sizing if the aggregate is not over the entire bottom surface area	12	inches
14	Media available pore space	0.2	in/in
15	Media filtration rate to be used for sizing	5	in/hr.
Baseline Calculations			
16	Allowable Routing Time for sizing	6	hours
17	Depth filtered during storm [Line 15 x Line 16]	30	inches
18	Depth of Detention Storage [Line 11 + (Line 12 x Line 14) + (Line 13 x Line 5)]	73.6	inches
19	Total Depth Treated [Line 17 + Line 18]	103.6	inches
Option 1 - Biofilter 1.5 times the DCV			
20	Required biofiltered volume [1.5 x Line 10]	4,949	cubic-feet
21	Required Footprint [Line 20 / Line 19] x 12	574	sq-ft
Option 2 - Store 0.75 of remaining DCV in pores and ponding			
22	Required Storage (surface + pores) Volume [0.75 x Line 10]	2,475	cubic-feet
23	Required Footprint [Line 22 / Line 18] x 12	404	sq-ft
Footpring of the BMP			
24	Area draining to the BMP	144,660	sq-ft
25	Adjusted Runoff Factor for drainage area (Refer to Appendix B.1 and B.2)	0.55	
26	Minimum BMP Footprint [Line 24 x Line 25 x 0.03]	2,394	sq ft
27	Footprint of the BMP = Maximum(Minimum(Line 21, Line 23), Line 26)	2,394	sq ft

IMP5

Surface	Runoff Factor (C)	Area (A)	Runoff Factor (C) x Area (A)
Roofs	0.90	1.02	0.92
Concrete or Asphalt	0.90		
Unit Pavers (grouted)	0.90		
Decomposed Granite	0.30		
Cobbles or Crushed Aggregate	0.30		
Amended, Mulched Soils or Landscape	0.10	0.35	0.04
Compacted Soil (e.g., unpaved parking)	0.30		
	∑ C x A =	0.96	
	∑ A =	1.37	
	C = ∑C x A / ∑ A =	**0.70**	

IMP5

Design Capture Volume		Worksheet B-2.1		
1	85th Percentile 24-hr storm depth from Figure B.1-1	d=	0.55	inches
2	Area tributary to BMP (s)	A=	1.37	acres
3	Area weighted runoff factor (estimate using Appendix B.1.1 and B.2.1)	C=	0.70	unit-less
4	Street trees volume reduction	TCV=		cubic feet
5	Rain barrels volume reduction	RCV=		cubic feet
6	Calculate DCV = (3630 x C x d x A) - TCV - RCV	DCV=	1,909	cubic feet

IMP5

	Simple Sizing Method for Biofitration BMPs	Worksheet B.5-1	
1	Remaining DCV, after implementing retention BMPs	1,909	cubic-feet
Partial Retention			
2	Infiltration rate from Worksheet D.5.1 if partial infiltration is feasible	0	in/hr.
3	Allowable drawdown time for aggregate storage below the underdrain	36	hours
4	Depth of runoff that can be infiltrated [Line 2 x Line 3]	0	inches
5	Aggregate pore space	0.40	in/in
6	Required depth of gravel below the underdrain [Line 4 / Line 5]	0	inches
7	Assumed surface area of the biofiltraiton BMP	1,249	sq-ft
8	Media retained pore space	0.1	in/in
9	Volume retained by BMP [[Line 4 + (Line 12 x Line 8)] / 12] x Line 7	187	cubic-feet
10	DCV that requires biofiltraiton [Line 1 - Line 9]	1,722	cubic-feet
BMP Parameters			
11	Surface Ponding [6 inch minimum, 12 inch maximum]	10	inches
12	Media Thickness [18 inches minimum]	18	inches
13	Aggregate Storage above underdrain invert (12 inches typical) - use 0 inches for sizing if the aggregate is not over the entire bottom surface area	0	inches
14	Media available pore space	0.2	in/in
15	Media filtration rate to be used for sizing	5	in/hr.
Baseline Calculations			
16	Allowable Routing Time for sizing	6	hours
17	Depth filtered during storm [Line 15 x Line 16]	30	inches
18	Depth of Detention Storage [Line 11 + (Line 12 x Line 14) + (Line 13 x Line 5)]	13.6	inches
19	Total Depth Treated [Line 17 + Line 18]	43.6	inches
Option 1 - Biofilter 1.5 times the DCV			
20	Required biofiltered volume [1.5 x Line 10]	2,583	cubic-feet
21	Required Footprint [Line 20 / Line 19] x 12	711	sq-ft
Option 2 - Store 0.75 of remaining DCV in pores and ponding			
22	Required Storage (surface + pores) Volume [0.75 x Line 10]	1,292	cubic-feet
23	Required Footprint [Line 22 / Line 18] x 12	1,140	sq-ft
Footpring of the BMP			
24	Area draining to the BMP	59,820	sq-ft
25	Adjusted Runoff Factor for drainage area (Refer to Appendix B.1 and B.2)	0.70	
26	Minimum BMP Footprint [Line 24 x Line 25 x 0.03]	1,249	sq ft
27	Footprint of the BMP = Maximum(Minimum(Line 21, Line 23), Line 26)	1,249	sq ft

IMP11

Surface	Runoff Factor (C)	Area (A)	Runoff Factor (C) x Area (A)
Roofs	0.90	0.55	0.49
Concrete or Asphalt	0.90		
Unit Pavers (grouted)	0.90		
Decomposed Granite	0.30		
Cobbles or Crushed Aggregate	0.30		
Amended, Mulched Soils or Landscape	0.10	0.239	0.02
Compacted Soil (e.g., unpaved parking)	0.30		
	∑ C x A =	0.52	
	∑ A =	0.79	
	C = ∑C x A / ∑ A =	**0.66**	

IMP11

Design Capture Volume		Worksheet B-2.1		
1	85th Percentile 24-hr storm depth from Figure B.1-1	d=	0.55	inches
2	Area tributary to BMP (s)	A=	0.79	acres
3	Area weighted runoff factor (estimate using Appendix B.1.1 and B.2.1)	C=	0.66	unit-less
4	Street trees volume reduction	TCV=		cubic feet
5	Rain barrels volume reduction	RCV=		cubic feet
6	Calculate DCV = (3630 x C x d x A) - TCV - RCV	DCV=	1,035	cubic feet

IMP11

	Simple Sizing Method for Biofitration BMPs	Worksheet B.5-1	
1	Remaining DCV, after implementing retention BMPs	1,035	cubic-feet
Partial Retention			
2	Infiltration rate from Worksheet D.5.1 if partial infiltration is feasible	0	in/hr.
3	Allowable drawdown time for aggregate storage below the underdrain	36	hours
4	Depth of runoff that can be infiltrated [Line 2 x Line 3]	0	inches
5	Aggregate pore space	0.40	in/in
6	Required depth of gravel below the underdrain [Line 4 / Line 5]	0	inches
7	Assumed surface area of the biofiltraiton BMP	678	sq-ft
8	Media retained pore space	0.1	in/in
9	Volume retained by BMP [[Line 4 + (Line 12 x Line 8)] / 12] x Line 7	102	cubic-feet
10	DCV that requires biofiltraiton [Line 1 - Line 9]	933	cubic-feet
BMP Parameters			
11	Surface Ponding [6 inch minimum, 12 inch maximum]	10	inches
12	Media Thickness [18 inches minimum]	18	inches
13	Aggregate Storage above underdrain invert (12 inches typical) - use 0 inches for sizing if the aggregate is not over the entire bottom surface area	0	inches
14	Media available pore space	0.2	in/in
15	Media filtration rate to be used for sizing	5	in/hr.
Baseline Calculations			
16	Allowable Routing Time for sizing	6	hours
17	Depth filtered during storm [Line 15 x Line 16]	30	inches
18	Depth of Detention Storage [Line 11 + (Line 12 x Line 14) + (Line 13 x Line 5)]	13.6	inches
19	Total Depth Treated [Line 17 + Line 18]	43.6	inches
Option 1 - Biofilter 1.5 times the DCV			
20	Required biofiltered volume [1.5 x Line 10]	1,400	cubic-feet
21	Required Footprint [Line 20 / Line 19] x 12	386	sq-ft
Option 2 - Store 0.75 of remaining DCV in pores and ponding			
22	Required Storage (surface + pores) Volume [0.75 x Line 10]	700	cubic-feet
23	Required Footprint [Line 22 / Line 18] x 12	618	sq-ft
Footpring of the BMP			
24	Area draining to the BMP	34,320	sq-ft
25	Adjusted Runoff Factor for drainage area (Refer to Appendix B.1 and B.2)	0.66	
26	Minimum BMP Footprint [Line 24 x Line 25 x 0.03]	678	sq ft
27	Footprint of the BMP = Maximum(Minimum(Line 21, Line 23), Line 26)	678	sq ft

IMP18

Surface	Runoff Factor (C)	Area (A)	Runoff Factor (C) x Area (A)
Roofs	0.90	1.02	0.92
Concrete or Asphalt	0.90		
Unit Pavers (grouted)	0.90		
Decomposed Granite	0.30		
Cobbles or Crushed Aggregate	0.30		
Amended, Mulched Soils or Landscape	0.10	0.398	0.04
Compacted Soil (e.g., unpaved parking)	0.30		
	∑ C x A =	0.96	
	∑ A =	1.42	
	C = ∑C x A / ∑ A =	**0.68**	

IMP18

Design Capture Volume		Worksheet B-2.1		
1	85th Percentile 24-hr storm depth from Figure B.1-1	d=	0.55	inches
2	Area tributary to BMP (s)	A=	1.42	acres
3	Area weighted runoff factor (estimate using Appendix B.1.1 and B.2.1)	C=	0.68	unit-less
4	Street trees volume reduction	TCV=		cubic feet
5	Rain barrels volume reduction	RCV=		cubic feet
6	Calculate DCV = (3630 x C x d x A) - TCV - RCV	DCV=	1,917	cubic feet

IMP18

	Simple Sizing Method for Biofitration BMPs	Worksheet B.5-1	
1	Remaining DCV, after implementing retention BMPs	1,917	cubic-feet
Partial Retention			
2	Infiltration rate from Worksheet D.5.1 if partial infiltration is feasible	0	in/hr.
3	Allowable drawdown time for aggregate storage below the underdrain	36	hours
4	Depth of runoff that can be infiltrated [Line 2 x Line 3]	0	inches
5	Aggregate pore space	0.40	in/in
6	Required depth of gravel below the underdrain [Line 4 / Line 5]	0	inches
7	Assumed surface area of the biofiltraiton BMP	1,255	sq-ft
8	Media retained pore space	0.1	in/in
9	Volume retained by BMP [[Line 4 + (Line 12 x Line 8)] / 12] x Line 7	188	cubic-feet
10	DCV that requires biofiltraiton [Line 1 - Line 9]	1,729	cubic-feet
BMP Parameters			
11	Surface Ponding [6 inch minimum, 12 inch maximum]	10	inches
12	Media Thickness [18 inches minimum]	18	inches
13	Aggregate Storage above underdrain invert (12 inches typical) - use 0 inches for sizing if the aggregate is not over the entire bottom surface area	0	inches
14	Media available pore space	0.2	in/in
15	Media filtration rate to be used for sizing	5	in/hr.
Baseline Calculations			
16	Allowable Routing Time for sizing	6	hours
17	Depth filtered during storm [Line 15 x Line 16]	30	inches
18	Depth of Detention Storage [Line 11 + (Line 12 x Line 14) + (Line 13 x Line 5)]	13.6	inches
19	Total Depth Treated [Line 17 + Line 18]	43.6	inches
Option 1 - Biofilter 1.5 times the DCV			
20	Required biofiltered volume [1.5 x Line 10]	2,594	cubic-feet
21	Required Footprint [Line 20 / Line 19] x 12	714	sq-ft
Option 2 - Store 0.75 of remaining DCV in pores and ponding			
22	Required Storage (surface + pores) Volume [0.75 x Line 10]	1,297	cubic-feet
23	Required Footprint [Line 22 / Line 18] x 12	1,145	sq-ft
Footpring of the BMP			
24	Area draining to the BMP	61,850	sq-ft
25	Adjusted Runoff Factor for drainage area (Refer to Appendix B.1 and B.2)	0.68	
26	Minimum BMP Footprint [Line 24 x Line 25 x 0.03]	1,255	sq ft
27	Footprint of the BMP = Maximum(Minimum(Line 21, Line 23), Line 26)	1,255	sq ft

IMP19

9	Runoff Factor (C)	Area (A)	Runoff Factor (C) x Area (A)
Roofs	0.90	0.11	0.10
Concrete or Asphalt	0.90		
Unit Pavers (grouted)	0.90		
Decomposed Granite	0.30		
Cobbles or Crushed Aggregate	0.30		
Amended, Mulched Soils or Landscape	0.10	0.845	0.08
Compacted Soil (e.g., unpaved parking)	0.30		
	∑ C x A =	0.19	
	∑ A =	0.96	
	C = ∑C x A / ∑ A =	**0.20**	

IMP19

Design Capture Volume		Worksheet B-2.1		
1	85th Percentile 24-hr storm depth from Figure B.1-1	d=	0.55	inches
2	Area tributary to BMP (s)	A=	0.96	acres
3	Area weighted runoff factor (estimate using Appendix B.1.1 and B.2.1)	C=	0.20	unit-less
4	Street trees volume reduction	TCV=		cubic feet
5	Rain barrels volume reduction	RCV=		cubic feet
6	Calculate DCV = (3630 x C x d x A) - TCV - RCV	DCV=	375	cubic feet

IMP19

	Simple Sizing Method for Biofitration BMPs	Worksheet B.5-1	
1	Remaining DCV, after implementing retention BMPs	375	cubic-feet
Partial Retention			
2	Infiltration rate from Worksheet D.5.1 if partial infiltration is feasible	0	in/hr.
3	Allowable drawdown time for aggregate storage below the underdrain	36	hours
4	Depth of runoff that can be infiltrated [Line 2 x Line 3]	0	inches
5	Aggregate pore space	0.40	in/in
6	Required depth of gravel below the underdrain [Line 4 / Line 5]	0	inches
7	Assumed surface area of the biofiltraiton BMP	246	sq-ft
8	Media retained pore space	0.1	in/in
9	Volume retained by BMP [[Line 4 + (Line 12 x Line 8)] / 12] x Line 7	37	cubic-feet
10	DCV that requires biofiltraiton [Line 1 - Line 9]	338	cubic-feet
BMP Parameters			
11	Surface Ponding [6 inch minimum, 12 inch maximum]	10	inches
12	Media Thickness [18 inches minimum]	18	inches
13	Aggregate Storage above underdrain invert (12 inches typical) - use 0 inches for sizing if the aggregate is not over the entire bottom surface area	0	inches
14	Media available pore space	0.2	in/in
15	Media filtration rate to be used for sizing	5	in/hr.
Baseline Calculations			
16	Allowable Routing Time for sizing	6	hours
17	Depth filtered during storm [Line 15 x Line 16]	30	inches
18	Depth of Detention Storage [Line 11 + (Line 12 x Line 14) + (Line 13 x Line 5)]	13.6	inches
19	Total Depth Treated [Line 17 + Line 18]	43.6	inches
Option 1 - Biofilter 1.5 times the DCV			
20	Required biofiltered volume [1.5 x Line 10]	508	cubic-feet
21	Required Footprint [Line 20 / Line 19] x 12	140	sq-ft
Option 2 - Store 0.75 of remaining DCV in pores and ponding			
22	Required Storage (surface + pores) Volume [0.75 x Line 10]	254	cubic-feet
23	Required Footprint [Line 22 / Line 18] x 12	225	sq-ft
Footpring of the BMP			
24	Area draining to the BMP	41,800	sq-ft
25	Adjusted Runoff Factor for drainage area (Refer to Appendix B.1 and B.2)	0.20	
26	Minimum BMP Footprint [Line 24 x Line 25 x 0.03]	246	sq ft
27	Footprint of the BMP = Maximum(Minimum(Line 21, Line 23), Line 26)	246	sq ft

IMP21

9	Runoff Factor (C)	Area (A)	Runoff Factor (C) x Area (A)
Roofs	0.90	0.42	0.38
Concrete or Asphalt	0.90		
Unit Pavers (grouted)	0.90		
Decomposed Granite	0.30		
Cobbles or Crushed Aggregate	0.30		
Amended, Mulched Soils or Landscape	0.10	0.093	0.01
Compacted Soil (e.g., unpaved parking)	0.30		
	∑ C x A =	0.39	
	∑ A =	0.52	
	C = ∑C x A / ∑ A =	**0.76**	

IMP21

Design Capture Volume		Worksheet B-2.1		
1	85th Percentile 24-hr storm depth from Figure B.1-1	d=	0.55	inches
2	Area tributary to BMP (s)	A=	0.52	acres
3	Area weighted runoff factor (estimate using Appendix B.1.1 and B.2.1)	C=	0.76	unit-less
4	Street trees volume reduction	TCV=		cubic feet
5	Rain barrels volume reduction	RCV=		cubic feet
6	Calculate DCV = (3630 x C x d x A) - TCV - RCV	DCV=	781	cubic feet

IMP21

	Simple Sizing Method for Biofitration BMPs	Worksheet B.5-1	
1	Remaining DCV, after implementing retention BMPs	781	cubic-feet
Partial Retention			
2	Infiltration rate from Worksheet D.5.1 if partial infiltration is feasible	0	in/hr.
3	Allowable drawdown time for aggregate storage below the underdrain	36	hours
4	Depth of runoff that can be infiltrated [Line 2 x Line 3]	0	inches
5	Aggregate pore space	0.40	in/in
6	Required depth of gravel below the underdrain [Line 4 / Line 5]	0	inches
7	Assumed surface area of the biofiltraiton BMP	511	sq-ft
8	Media retained pore space	0.1	in/in
9	Volume retained by BMP [[Line 4 + (Line 12 x Line 8)] / 12] x Line 7	77	cubic-feet
10	DCV that requires biofiltraiton [Line 1 - Line 9]	704	cubic-feet
BMP Parameters			
11	Surface Ponding [6 inch minimum, 12 inch maximum]	10	inches
12	Media Thickness [18 inches minimum]	18	inches
13	Aggregate Storage above underdrain invert (12 inches typical) - use 0 inches for sizing if the aggregate is not over the entire bottom surface area	0	inches
14	Media available pore space	0.2	in/in
15	Media filtration rate to be used for sizing	5	in/hr.
Baseline Calculations			
16	Allowable Routing Time for sizing	6	hours
17	Depth filtered during storm [Line 15 x Line 16]	30	inches
18	Depth of Detention Storage [Line 11 + (Line 12 x Line 14) + (Line 13 x Line 5)]	13.6	inches
19	Total Depth Treated [Line 17 + Line 18]	43.6	inches
Option 1 - Biofilter 1.5 times the DCV			
20	Required biofiltered volume [1.5 x Line 10]	1,057	cubic-feet
21	Required Footprint [Line 20 / Line 19] x 12	291	sq-ft
Option 2 - Store 0.75 of remaining DCV in pores and ponding			
22	Required Storage (surface + pores) Volume [0.75 x Line 10]	529	cubic-feet
23	Required Footprint [Line 22 / Line 18] x 12	467	sq-ft
Footpring of the BMP			
24	Area draining to the BMP	22,520	sq-ft
25	Adjusted Runoff Factor for drainage area (Refer to Appendix B.1 and B.2)	0.76	
26	Minimum BMP Footprint [Line 24 x Line 25 x 0.03]	511	sq ft
27	Footprint of the BMP = Maximum(Minimum(Line 21, Line 23), Line 26)	511	sq ft

IMP22

9	Runoff Factor (C)	Area (A)	Runoff Factor (C) x Area (A)
Roofs	0.90	1.88	1.69
Concrete or Asphalt	0.90		
Unit Pavers (grouted)	0.90		
Decomposed Granite	0.30		
Cobbles or Crushed Aggregate	0.30		
Amended, Mulched Soils or Landscape	0.10	1.610	0.16
Compacted Soil (e.g., unpaved parking)	0.30		
	∑ C x A =	1.86	
	∑ A =	3.49	
	C = ∑C x A / ∑ A =	**0.53**	

IMP22

Design Capture Volume		Worksheet B-2.1		
1	85th Percentile 24-hr storm depth from Figure B.1-1	d=	0.55	inches
2	Area tributary to BMP (s)	A=	3.49	acres
3	Area weighted runoff factor (estimate using Appendix B.1.1 and B.2.1)	C=	0.53	unit-less
4	Street trees volume reduction	TCV=		cubic feet
5	Rain barrels volume reduction	RCV=		cubic feet
6	Calculate DCV = (3630 x C x d x A) - TCV - RCV	DCV=	3,704	cubic feet

IMP22

	Simple Sizing Method for Biofitration BMPs	Worksheet B.5-1	
1	Remaining DCV, after implementing retention BMPs	3,704	cubic-feet
Partial Retention			
2	Infiltration rate from Worksheet D.5.1 if partial infiltration is feasible	0	in/hr.
3	Allowable drawdown time for aggregate storage below the underdrain	36	hours
4	Depth of runoff that can be infiltrated [Line 2 x Line 3]	0	inches
5	Aggregate pore space	0.40	in/in
6	Required depth of gravel below the underdrain [Line 4 / Line 5]	0	inches
7	Assumed surface area of the biofiltraiton BMP	2,425	sq-ft
8	Media retained pore space	0.1	in/in
9	Volume retained by BMP [[Line 4 + (Line 12 x Line 8)] / 12] x Line 7	364	cubic-feet
10	DCV that requires biofiltraiton [Line 1 - Line 9]	3,340	cubic-feet
BMP Parameters			
11	Surface Ponding [6 inch minimum, 12 inch maximum]	10	inches
12	Media Thickness [18 inches minimum]	18	inches
13	Aggregate Storage above underdrain invert (12 inches typical) - use 0 inches for sizing if the aggregate is not over the entire bottom surface area	0	inches
14	Media available pore space	0.2	in/in
15	Media filtration rate to be used for sizing	5	in/hr.
Baseline Calculations			
16	Allowable Routing Time for sizing	6	hours
17	Depth filtered during storm [Line 15 x Line 16]	30	inches
18	Depth of Detention Storage [Line 11 + (Line 12 x Line 14) + (Line 13 x Line 5)]	13.6	inches
19	Total Depth Treated [Line 17 + Line 18]	43.6	inches
Option 1 - Biofilter 1.5 times the DCV			
20	Required biofiltered volume [1.5 x Line 10]	5,011	cubic-feet
21	Required Footprint [Line 20 / Line 19] x 12	1,380	sq-ft
Option 2 - Store 0.75 of remaining DCV in pores and ponding			
22	Required Storage (surface + pores) Volume [0.75 x Line 10]	2,506	cubic-feet
23	Required Footprint [Line 22 / Line 18] x 12	2,212	sq-ft
Footpring of the BMP			
24	Area draining to the BMP	152,121	sq-ft
25	Adjusted Runoff Factor for drainage area (Refer to Appendix B.1 and B.2)	0.53	
26	Minimum BMP Footprint [Line 24 x Line 25 x 0.03]	2,425	sq ft
27	Footprint of the BMP = Maximum(Minimum(Line 21, Line 23), Line 26)	2,425	sq ft

IMP23

9	Runoff Factor (C)	Area (A)	Runoff Factor (C) x Area (A)
Roofs	0.90	1.35	1.22
Concrete or Asphalt	0.90		
Unit Pavers (grouted)	0.90		
Decomposed Granite	0.30		
Cobbles or Crushed Aggregate	0.30		
Amended, Mulched Soils or Landscape	0.10	0.357	0.04
Compacted Soil (e.g., unpaved parking)	0.30		
	∑ C x A =	1.25	
	∑ A =	1.71	
	C = ∑C x A / ∑ A =	**0.73**	

IMP23

Design Capture Volume		Worksheet B-2.1		
1	85th Percentile 24-hr storm depth from Figure B.1-1	d=	0.55	inches
2	Area tributary to BMP (s)	A=	1.71	acres
3	Area weighted runoff factor (estimate using Appendix B.1.1 and B.2.1)	C=	0.73	unit-less
4	Street trees volume reduction	TCV=		cubic feet
5	Rain barrels volume reduction	RCV=		cubic feet
6	Calculate DCV = (3630 x C x d x A) - TCV - RCV	DCV=	2,505	cubic feet

IMP23

	Simple Sizing Method for Biofitration BMPs	Worksheet B.5-1	
1	Remaining DCV, after implementing retention BMPs	2,505	cubic-feet
Partial Retention			
2	Infiltration rate from Worksheet D.5.1 if partial infiltration is feasible	0	in/hr.
3	Allowable drawdown time for aggregate storage below the underdrain	36	hours
4	Depth of runoff that can be infiltrated [Line 2 x Line 3]	0	inches
5	Aggregate pore space	0.40	in/in
6	Required depth of gravel below the underdrain [Line 4 / Line 5]	0	inches
7	Assumed surface area of the biofiltraiton BMP	1,640	sq-ft
8	Media retained pore space	0.1	in/in
9	Volume retained by BMP [[Line 4 + (Line 12 x Line 8)] / 12] x Line 7	246	cubic-feet
10	DCV that requires biofiltraiton [Line 1 - Line 9]	2,259	cubic-feet
BMP Parameters			
11	Surface Ponding [6 inch minimum, 12 inch maximum]	10	inches
12	Media Thickness [18 inches minimum]	18	inches
13	Aggregate Storage above underdrain invert (12 inches typical) - use 0 inches for sizing if the aggregate is not over the entire bottom surface area	0	inches
14	Media available pore space	0.2	in/in
15	Media filtration rate to be used for sizing	5	in/hr.
Baseline Calculations			
16	Allowable Routing Time for sizing	6	hours
17	Depth filtered during storm [Line 15 x Line 16]	30	inches
18	Depth of Detention Storage [Line 11 + (Line 12 x Line 14) + (Line 13 x Line 5)]	13.6	inches
19	Total Depth Treated [Line 17 + Line 18]	43.6	inches
Option 1 - Biofilter 1.5 times the DCV			
20	Required biofiltered volume [1.5 x Line 10]	3,389	cubic-feet
21	Required Footprint [Line 20 / Line 19] x 12	933	sq-ft
Option 2 - Store 0.75 of remaining DCV in pores and ponding			
22	Required Storage (surface + pores) Volume [0.75 x Line 10]	1,695	cubic-feet
23	Required Footprint [Line 22 / Line 18] x 12	1,496	sq-ft
Footpring of the BMP			
24	Area draining to the BMP	74,542	sq-ft
25	Adjusted Runoff Factor for drainage area (Refer to Appendix B.1 and B.2)	0.73	
26	Minimum BMP Footprint [Line 24 x Line 25 x 0.03]	1,640	sq ft
27	Footprint of the BMP = Maximum(Minimum(Line 21, Line 23), Line 26)	1,640	sq ft

IMP24

9	Runoff Factor (C)	Area (A)	Runoff Factor (C) x Area (A)
Roofs	0.90	0.66	0.60
Concrete or Asphalt	0.90		
Unit Pavers (grouted)	0.90		
Decomposed Granite	0.30		
Cobbles or Crushed Aggregate	0.30		
Amended, Mulched Soils or Landscape	0.10	0.293	0.03
Compacted Soil (e.g., unpaved parking)	0.30		
	∑ C x A =	0.63	
	∑ A =	0.96	
	C = ∑C x A / ∑ A =	**0.66**	

IMP24

Design Capture Volume		Worksheet B-2.1		
1	85th Percentile 24-hr storm depth from Figure B.1-1	d=	0.55	inches
2	Area tributary to BMP (s)	A=	0.96	acres
3	Area weighted runoff factor (estimate using Appendix B.1.1 and B.2.1)	C=	0.66	unit-less
4	Street trees volume reduction	TCV=		cubic feet
5	Rain barrels volume reduction	RCV=		cubic feet
6	Calculate DCV = (3630 x C x d x A) - TCV - RCV	DCV=	1,251	cubic feet

IMP24

	Simple Sizing Method for Biofitration BMPs	Worksheet B.5-1	
1	Remaining DCV, after implementing retention BMPs	1,251	cubic-feet
Partial Retention			
2	Infiltration rate from Worksheet D.5.1 if partial infiltration is feasible	0	in/hr.
3	Allowable drawdown time for aggregate storage below the underdrain	36	hours
4	Depth of runoff that can be infiltrated [Line 2 x Line 3]	0	inches
5	Aggregate pore space	0.40	in/in
6	Required depth of gravel below the underdrain [Line 4 / Line 5]	0	inches
7	Assumed surface area of the biofiltraiton BMP	819	sq-ft
8	Media retained pore space	0.1	in/in
9	Volume retained by BMP [[Line 4 + (Line 12 x Line 8)] / 12] x Line 7	123	cubic-feet
10	DCV that requires biofiltraiton [Line 1 - Line 9]	1,128	cubic-feet
BMP Parameters			
11	Surface Ponding [6 inch minimum, 12 inch maximum]	10	inches
12	Media Thickness [18 inches minimum]	18	inches
13	Aggregate Storage above underdrain invert (12 inches typical) - use 0 inches for sizing if the aggregate is not over the entire bottom surface area	0	inches
14	Media available pore space	0.2	in/in
15	Media filtration rate to be used for sizing	5	in/hr.
Baseline Calculations			
16	Allowable Routing Time for sizing	6	hours
17	Depth filtered during storm [Line 15 x Line 16]	30	inches
18	Depth of Detention Storage [Line 11 + (Line 12 x Line 14) + (Line 13 x Line 5)]	13.6	inches
19	Total Depth Treated [Line 17 + Line 18]	43.6	inches
Option 1 - Biofilter 1.5 times the DCV			
20	Required biofiltered volume [1.5 x Line 10]	1,693	cubic-feet
21	Required Footprint [Line 20 / Line 19] x 12	466	sq-ft
Option 2 - Store 0.75 of remaining DCV in pores and ponding			
22	Required Storage (surface + pores) Volume [0.75 x Line 10]	847	cubic-feet
23	Required Footprint [Line 22 / Line 18] x 12	748	sq-ft
Footpring of the BMP			
24	Area draining to the BMP	41,650	sq-ft
25	Adjusted Runoff Factor for drainage area (Refer to Appendix B.1 and B.2)	0.66	
26	Minimum BMP Footprint [Line 24 x Line 25 x 0.03]	819	sq ft
27	Footprint of the BMP = Maximum(Minimum(Line 21, Line 23), Line 26)	819	sq ft

IMP25

9	Runoff Factor (C)	Area (A)	Runoff Factor (C) x Area (A)
Roofs	0.90	0.67	0.61
Concrete or Asphalt	0.90		
Unit Pavers (grouted)	0.90		
Decomposed Granite	0.30		
Cobbles or Crushed Aggregate	0.30		
Amended, Mulched Soils or Landscape	0.10	0.129	0.01
Compacted Soil (e.g., unpaved parking)	0.30		
	∑ C x A =	0.62	
	∑ A =	0.80	
	C = ∑C x A / ∑ A =	**0.77**	

IMP25

Design Capture Volume		Worksheet B-2.1		
1	85th Percentile 24-hr storm depth from Figure B.1-1	d=	0.55	inches
2	Area tributary to BMP (s)	A=	0.80	acres
3	Area weighted runoff factor (estimate using Appendix B.1.1 and B.2.1)	C=	0.77	unit-less
4	Street trees volume reduction	TCV=		cubic feet
5	Rain barrels volume reduction	RCV=		cubic feet
6	Calculate DCV = (3630 x C x d x A) - TCV - RCV	DCV=	1,235	cubic feet

IMP25

	Simple Sizing Method for Biofitration BMPs	Worksheet B.5-1	
1	Remaining DCV, after implementing retention BMPs	1,235	cubic-feet
Partial Retention			
2	Infiltration rate from Worksheet D.5.1 if partial infiltration is feasible	0	in/hr.
3	Allowable drawdown time for aggregate storage below the underdrain	36	hours
4	Depth of runoff that can be infiltrated [Line 2 x Line 3]	0	inches
5	Aggregate pore space	0.40	in/in
6	Required depth of gravel below the underdrain [Line 4 / Line 5]	0	inches
7	Assumed surface area of the biofiltraiton BMP	809	sq-ft
8	Media retained pore space	0.1	in/in
9	Volume retained by BMP [[Line 4 + (Line 12 x Line 8)] / 12] x Line 7	121	cubic-feet
10	DCV that requires biofiltraiton [Line 1 - Line 9]	1,114	cubic-feet
BMP Parameters			
11	Surface Ponding [6 inch minimum, 12 inch maximum]	10	inches
12	Media Thickness [18 inches minimum]	18	inches
13	Aggregate Storage above underdrain invert (12 inches typical) - use 0 inches for sizing if the aggregate is not over the entire bottom surface area	0	inches
14	Media available pore space	0.2	in/in
15	Media filtration rate to be used for sizing	5	in/hr.
Baseline Calculations			
16	Allowable Routing Time for sizing	6	hours
17	Depth filtered during storm [Line 15 x Line 16]	30	inches
18	Depth of Detention Storage [Line 11 + (Line 12 x Line 14) + (Line 13 x Line 5)]	13.6	inches
19	Total Depth Treated [Line 17 + Line 18]	43.6	inches
Option 1 - Biofilter 1.5 times the DCV			
20	Required biofiltered volume [1.5 x Line 10]	1,671	cubic-feet
21	Required Footprint [Line 20 / Line 19] x 12	460	sq-ft
Option 2 - Store 0.75 of remaining DCV in pores and ponding			
22	Required Storage (surface + pores) Volume [0.75 x Line 10]	836	cubic-feet
23	Required Footprint [Line 22 / Line 18] x 12	738	sq-ft
Footpring of the BMP			
24	Area draining to the BMP	34,910	sq-ft
25	Adjusted Runoff Factor for drainage area (Refer to Appendix B.1 and B.2)	0.77	
26	Minimum BMP Footprint [Line 24 x Line 25 x 0.03]	809	sq ft
27	Footprint of the BMP = Maximum(Minimum(Line 21, Line 23), Line 26)	809	sq ft

IMP26

9	Runoff Factor (C)	Area (A)	Runoff Factor (C) x Area (A)
Roofs	0.90	0.80	0.72
Concrete or Asphalt	0.90		
Unit Pavers (grouted)	0.90		
Decomposed Granite	0.30		
Cobbles or Crushed Aggregate	0.30		
Amended, Mulched Soils or Landscape	0.10	0.206	0.02
Compacted Soil (e.g., unpaved parking)	0.30		
	∑ C x A =	0.74	
	∑ A =	1.01	
	C = ∑C x A / ∑ A =	**0.74**	

IMP26

Design Capture Volume		Worksheet B-2.1		
1	85th Percentile 24-hr storm depth from Figure B.1-1	d=	0.55	inches
2	Area tributary to BMP (s)	A=	1.01	acres
3	Area weighted runoff factor (estimate using Appendix B.1.1 and B.2.1)	C=	0.74	unit-less
4	Street trees volume reduction	TCV=		cubic feet
5	Rain barrels volume reduction	RCV=		cubic feet
6	Calculate DCV = (3630 x C x d x A) - TCV - RCV	DCV=	1,485	cubic feet

IMP26

	Simple Sizing Method for Biofitration BMPs	Worksheet B.5-1	
1	Remaining DCV, after implementing retention BMPs	1,485	cubic-feet
Partial Retention			
2	Infiltration rate from Worksheet D.5.1 if partial infiltration is feasible	0	in/hr.
3	Allowable drawdown time for aggregate storage below the underdrain	36	hours
4	Depth of runoff that can be infiltrated [Line 2 x Line 3]	0	inches
5	Aggregate pore space	0.40	in/in
6	Required depth of gravel below the underdrain [Line 4 / Line 5]	0	inches
7	Assumed surface area of the biofiltraiton BMP	972	sq-ft
8	Media retained pore space	0.1	in/in
9	Volume retained by BMP [[Line 4 + (Line 12 x Line 8)] / 12] x Line 7	146	cubic-feet
10	DCV that requires biofiltraiton [Line 1 - Line 9]	1,339	cubic-feet
BMP Parameters			
11	Surface Ponding [6 inch minimum, 12 inch maximum]	10	inches
12	Media Thickness [18 inches minimum]	18	inches
13	Aggregate Storage above underdrain invert (12 inches typical) - use 0 inches for sizing if the aggregate is not over the entire bottom surface area	0	inches
14	Media available pore space	0.2	in/in
15	Media filtration rate to be used for sizing	5	in/hr.
Baseline Calculations			
16	Allowable Routing Time for sizing	6	hours
17	Depth filtered during storm [Line 15 x Line 16]	30	inches
18	Depth of Detention Storage [Line 11 + (Line 12 x Line 14) + (Line 13 x Line 5)]	13.6	inches
19	Total Depth Treated [Line 17 + Line 18]	43.6	inches
Option 1 - Biofilter 1.5 times the DCV			
20	Required biofiltered volume [1.5 x Line 10]	2,009	cubic-feet
21	Required Footprint [Line 20 / Line 19] x 12	553	sq-ft
Option 2 - Store 0.75 of remaining DCV in pores and ponding			
22	Required Storage (surface + pores) Volume [0.75 x Line 10]	1,005	cubic-feet
23	Required Footprint [Line 22 / Line 18] x 12	887	sq-ft
Footpring of the BMP			
24	Area draining to the BMP	43,980	sq-ft
25	Adjusted Runoff Factor for drainage area (Refer to Appendix B.1 and B.2)	0.74	
26	Minimum BMP Footprint [Line 24 x Line 25 x 0.03]	972	sq ft
27	Footprint of the BMP = Maximum(Minimum(Line 21, Line 23), Line 26)	972	sq ft

IMP27

9	Runoff Factor (C)	Area (A)	Runoff Factor (C) x Area (A)
Roofs	0.90	1.15	1.03
Concrete or Asphalt	0.90		
Unit Pavers (grouted)	0.90		
Decomposed Granite	0.30		
Cobbles or Crushed Aggregate	0.30		
Amended, Mulched Soils or Landscape	0.10	0.912	0.09
Compacted Soil (e.g., unpaved parking)	0.30		
	∑ C x A =	1.12	
	∑ A =	2.06	
	C = ∑C x A / ∑ A =	**0.55**	

IMP27

Design Capture Volume		Worksheet B-2.1		
1	85th Percentile 24-hr storm depth from Figure B.1-1	d=	0.55	inches
2	Area tributary to BMP (s)	A=	2.06	acres
3	Area weighted runoff factor (estimate using Appendix B.1.1 and B.2.1)	C=	0.55	unit-less
4	Street trees volume reduction	TCV=		cubic feet
5	Rain barrels volume reduction	RCV=		cubic feet
6	Calculate DCV = (3630 x C x d x A) - TCV - RCV	DCV=	2,244	cubic feet

IMP27

	Simple Sizing Method for Biofitration BMPs	Worksheet B.5-1	
1	Remaining DCV, after implementing retention BMPs	2,244	cubic-feet
Partial Retention			
2	Infiltration rate from Worksheet D.5.1 if partial infiltration is feasible	0	in/hr.
3	Allowable drawdown time for aggregate storage below the underdrain	36	hours
4	Depth of runoff that can be infiltrated [Line 2 x Line 3]	0	inches
5	Aggregate pore space	0.40	in/in
6	Required depth of gravel below the underdrain [Line 4 / Line 5]	0	inches
7	Assumed surface area of the biofiltraiton BMP	1,469	sq-ft
8	Media retained pore space	0.1	in/in
9	Volume retained by BMP [[Line 4 + (Line 12 x Line 8)] / 12] x Line 7	220	cubic-feet
10	DCV that requires biofiltraiton [Line 1 - Line 9]	2,024	cubic-feet
BMP Parameters			
11	Surface Ponding [6 inch minimum, 12 inch maximum]	10	inches
12	Media Thickness [18 inches minimum]	18	inches
13	Aggregate Storage above underdrain invert (12 inches typical) - use 0 inches for sizing if the aggregate is not over the entire bottom surface area	0	inches
14	Media available pore space	0.2	in/in
15	Media filtration rate to be used for sizing	5	in/hr.
Baseline Calculations			
16	Allowable Routing Time for sizing	6	hours
17	Depth filtered during storm [Line 15 x Line 16]	30	inches
18	Depth of Detention Storage [Line 11 + (Line 12 x Line 14) + (Line 13 x Line 5)]	13.6	inches
19	Total Depth Treated [Line 17 + Line 18]	43.6	inches
Option 1 - Biofilter 1.5 times the DCV			
20	Required biofiltered volume [1.5 x Line 10]	3,036	cubic-feet
21	Required Footprint [Line 20 / Line 19] x 12	836	sq-ft
Option 2 - Store 0.75 of remaining DCV in pores and ponding			
22	Required Storage (surface + pores) Volume [0.75 x Line 10]	1,518	cubic-feet
23	Required Footprint [Line 22 / Line 18] x 12	1,340	sq-ft
Footpring of the BMP			
24	Area draining to the BMP	89,690	sq-ft
25	Adjusted Runoff Factor for drainage area (Refer to Appendix B.1 and B.2)	0.55	
26	Minimum BMP Footprint [Line 24 x Line 25 x 0.03]	1,469	sq ft
27	Footprint of the BMP = Maximum(Minimum(Line 21, Line 23), Line 26)	1,469	sq ft

IMP28

9	Runoff Factor (C)	Area (A)	Runoff Factor (C) x Area (A)
Roofs	0.90	0.24	0.21
Concrete or Asphalt	0.90		
Unit Pavers (grouted)	0.90		
Decomposed Granite	0.30		
Cobbles or Crushed Aggregate	0.30		
Amended, Mulched Soils or Landscape	0.10	0.286	0.03
Compacted Soil (e.g., unpaved parking)	0.30		
	∑ C x A =	0.24	
	∑ A =	0.52	
	C = ∑C x A / ∑ A =	**0.46**	

IMP28

Design Capture Volume		Worksheet B-2.1		
1	85th Percentile 24-hr storm depth from Figure B.1-1	d=	0.55	inches
2	Area tributary to BMP (s)	A=	0.52	acres
3	Area weighted runoff factor (estimate using Appendix B.1.1 and B.2.1)	C=	0.46	unit-less
4	Street trees volume reduction	TCV=		cubic feet
5	Rain barrels volume reduction	RCV=		cubic feet
6	Calculate DCV = (3630 x C x d x A) - TCV - RCV	DCV=	484	cubic feet

IMP28

	Simple Sizing Method for Biofitration BMPs	Worksheet B.5-1	
1	Remaining DCV, after implementing retention BMPs	484	cubic-feet
Partial Retention			
2	Infiltration rate from Worksheet D.5.1 if partial infiltration is feasible	0	in/hr.
3	Allowable drawdown time for aggregate storage below the underdrain	36	hours
4	Depth of runoff that can be infiltrated [Line 2 x Line 3]	0	inches
5	Aggregate pore space	0.40	in/in
6	Required depth of gravel below the underdrain [Line 4 / Line 5]	0	inches
7	Assumed surface area of the biofiltraiton BMP	317	sq-ft
8	Media retained pore space	0.1	in/in
9	Volume retained by BMP [[Line 4 + (Line 12 x Line 8)] / 12] x Line 7	48	cubic-feet
10	DCV that requires biofiltraiton [Line 1 - Line 9]	436	cubic-feet
BMP Parameters			
11	Surface Ponding [6 inch minimum, 12 inch maximum]	10	inches
12	Media Thickness [18 inches minimum]	18	inches
13	Aggregate Storage above underdrain invert (12 inches typical) - use 0 inches for sizing if the aggregate is not over the entire bottom surface area	0	inches
14	Media available pore space	0.2	in/in
15	Media filtration rate to be used for sizing	5	in/hr.
Baseline Calculations			
16	Allowable Routing Time for sizing	6	hours
17	Depth filtered during storm [Line 15 x Line 16]	30	inches
18	Depth of Detention Storage [Line 11 + (Line 12 x Line 14) + (Line 13 x Line 5)]	13.6	inches
19	Total Depth Treated [Line 17 + Line 18]	43.6	inches
Option 1 - Biofilter 1.5 times the DCV			
20	Required biofiltered volume [1.5 x Line 10]	655	cubic-feet
21	Required Footprint [Line 20 / Line 19] x 12	181	sq-ft
Option 2 - Store 0.75 of remaining DCV in pores and ponding			
22	Required Storage (surface + pores) Volume [0.75 x Line 10]	328	cubic-feet
23	Required Footprint [Line 22 / Line 18] x 12	290	sq-ft
Footpring of the BMP			
24	Area draining to the BMP	22,791	sq-ft
25	Adjusted Runoff Factor for drainage area (Refer to Appendix B.1 and B.2)	0.46	
26	Minimum BMP Footprint [Line 24 x Line 25 x 0.03]	317	sq ft
27	Footprint of the BMP = Maximum(Minimum(Line 21, Line 23), Line 26)	317	sq ft

IMP29

9	Runoff Factor (C)	Area (A)	Runoff Factor (C) x Area (A)
Roofs	0.90	0.22	0.20
Concrete or Asphalt	0.90		
Unit Pavers (grouted)	0.90		
Decomposed Granite	0.30		
Cobbles or Crushed Aggregate	0.30		
Amended, Mulched Soils or Landscape	0.10	0.294	0.03
Compacted Soil (e.g., unpaved parking)	0.30		
	∑ C x A =	0.23	
	∑ A =	0.52	
	C = ∑C x A / ∑ A =	**0.45**	

IMP29

Design Capture Volume		Worksheet B-2.1		
1	85th Percentile 24-hr storm depth from Figure B.1-1	d=	0.55	inches
2	Area tributary to BMP (s)	A=	0.52	acres
3	Area weighted runoff factor (estimate using Appendix B.1.1 and B.2.1)	C=	0.45	unit-less
4	Street trees volume reduction	TCV=		cubic feet
5	Rain barrels volume reduction	RCV=		cubic feet
6	Calculate DCV = (3630 x C x d x A) - TCV - RCV	DCV=	462	cubic feet

IMP29

	Simple Sizing Method for Biofitration BMPs	Worksheet B.5-1	
1	Remaining DCV, after implementing retention BMPs	462	cubic-feet
Partial Retention			
2	Infiltration rate from Worksheet D.5.1 if partial infiltration is feasible	0	in/hr.
3	Allowable drawdown time for aggregate storage below the underdrain	36	hours
4	Depth of runoff that can be infiltrated [Line 2 x Line 3]	0	inches
5	Aggregate pore space	0.40	in/in
6	Required depth of gravel below the underdrain [Line 4 / Line 5]	0	inches
7	Assumed surface area of the biofiltraiton BMP	441	sq-ft
8	Media retained pore space	0.1	in/in
9	Volume retained by BMP [[Line 4 + (Line 12 x Line 8)] / 12] x Line 7	66	cubic-feet
10	DCV that requires biofiltraiton [Line 1 - Line 9]	396	cubic-feet
BMP Parameters			
11	Surface Ponding [6 inch minimum, 12 inch maximum]	10	inches
12	Media Thickness [18 inches minimum]	18	inches
13	Aggregate Storage above underdrain invert (12 inches typical) - use 0 inches for sizing if the aggregate is not over the entire bottom surface area	0	inches
14	Media available pore space	0.2	in/in
15	Media filtration rate to be used for sizing	5	in/hr.
Baseline Calculations			
16	Allowable Routing Time for sizing	6	hours
17	Depth filtered during storm [Line 15 x Line 16]	30	inches
18	Depth of Detention Storage [Line 11 + (Line 12 x Line 14) + (Line 13 x Line 5)]	13.6	inches
19	Total Depth Treated [Line 17 + Line 18]	43.6	inches
Option 1 - Biofilter 1.5 times the DCV			
20	Required biofiltered volume [1.5 x Line 10]	594	cubic-feet
21	Required Footprint [Line 20 / Line 19] x 12	164	sq-ft
Option 2 - Store 0.75 of remaining DCV in pores and ponding			
22	Required Storage (surface + pores) Volume [0.75 x Line 10]	297	cubic-feet
23	Required Footprint [Line 22 / Line 18] x 12	263	sq-ft
Footpring of the BMP			
24	Area draining to the BMP	22,580	sq-ft
25	Adjusted Runoff Factor for drainage area (Refer to Appendix B.1 and B.2)	0.45	
26	Minimum BMP Footprint [Line 24 x Line 25 x 0.03]	303	sq ft
27	Footprint of the BMP = Maximum(Minimum(Line 21, Line 23), Line 26)	303	sq ft

IMP30

9	Runoff Factor (C)	Area (A)	Runoff Factor (C) x Area (A)
Roofs	0.90	2.22	2.00
Concrete or Asphalt	0.90		
Unit Pavers (grouted)	0.90		
Decomposed Granite	0.30		
Cobbles or Crushed Aggregate	0.30		
Amended, Mulched Soils or Landscape	0.10	0.803	0.08
Compacted Soil (e.g., unpaved parking)	0.30		
	∑ C x A =	2.08	
	∑ A =	3.03	
	C = ∑C x A / ∑ A =	**0.69**	

IMP30

Design Capture Volume		Worksheet B-2.1		
1	85th Percentile 24-hr storm depth from Figure B.1-1	d=	0.55	inches
2	Area tributary to BMP (s)	A=	3.03	acres
3	Area weighted runoff factor (estimate using Appendix B.1.1 and B.2.1)	C=	0.69	unit-less
4	Street trees volume reduction	TCV=		cubic feet
5	Rain barrels volume reduction	RCV=		cubic feet
6	Calculate DCV = (3630 x C x d x A) - TCV - RCV	DCV=	4,153	cubic feet

IMP30

	Simple Sizing Method for Biofitration BMPs	Worksheet B.5-1	
1	Remaining DCV, after implementing retention BMPs	4,153	cubic-feet
Partial Retention			
2	Infiltration rate from Worksheet D.5.1 if partial infiltration is feasible	0	in/hr.
3	Allowable drawdown time for aggregate storage below the underdrain	36	hours
4	Depth of runoff that can be infiltrated [Line 2 x Line 3]	0	inches
5	Aggregate pore space	0.40	in/in
6	Required depth of gravel below the underdrain [Line 4 / Line 5]	0	inches
7	Assumed surface area of the biofiltraiton BMP	2,719	sq-ft
8	Media retained pore space	0.1	in/in
9	Volume retained by BMP [[Line 4 + (Line 12 x Line 8)] / 12] x Line 7	408	cubic-feet
10	DCV that requires biofiltraiton [Line 1 - Line 9]	3,745	cubic-feet
BMP Parameters			
11	Surface Ponding [6 inch minimum, 12 inch maximum]	10	inches
12	Media Thickness [18 inches minimum]	18	inches
13	Aggregate Storage above underdrain invert (12 inches typical) - use 0 inches for sizing if the aggregate is not over the entire bottom surface area	0	inches
14	Media available pore space	0.2	in/in
15	Media filtration rate to be used for sizing	5	in/hr.
Baseline Calculations			
16	Allowable Routing Time for sizing	6	hours
17	Depth filtered during storm [Line 15 x Line 16]	30	inches
18	Depth of Detention Storage [Line 11 + (Line 12 x Line 14) + (Line 13 x Line 5)]	13.6	inches
19	Total Depth Treated [Line 17 + Line 18]	43.6	inches
Option 1 - Biofilter 1.5 times the DCV			
20	Required biofiltered volume [1.5 x Line 10]	5,618	cubic-feet
21	Required Footprint [Line 20 / Line 19] x 12	1,547	sq-ft
Option 2 - Store 0.75 of remaining DCV in pores and ponding			
22	Required Storage (surface + pores) Volume [0.75 x Line 10]	2,809	cubic-feet
23	Required Footprint [Line 22 / Line 18] x 12	2,479	sq-ft
Footpring of the BMP			
24	Area draining to the BMP	131,780	sq-ft
25	Adjusted Runoff Factor for drainage area (Refer to Appendix B.1 and B.2)	0.69	
26	Minimum BMP Footprint [Line 24 x Line 25 x 0.03]	2,719	sq ft
27	Footprint of the BMP = Maximum(Minimum(Line 21, Line 23), Line 26)	2,719	sq ft


GENERAL LEGEND
USD BOUNDARY
CONTROL
EDGE OF CONC.
EDGE OF ASPH.
EDGE OF DIRT
AWNING
BUILDING
SIDEWALK
CURB AND GUTTER
FENCE
WALL
RETAINING WALL
GUARD RAIL
PIPE LINE
PARKING STRIPES
ROAD STRIPING
POOL
RAILROAD
RAIL SIGNAL
TANK
VAULT
DROP INLET
VALVE
CATCH BASIN
WATER LINE
FIRE HYDRANT
MANHOLE
STANDPIPE
SIGN
POWER POLE GUY WIRE
POWER POLE STREET LIGHT
STREET LIGHT STOP LIGHT
MISCELLANEOUS
TREES
SINGLE TREE
PALM
INDEX CONTOUR
INTER CONTOUR
ABBREVIATIONS:
A.–Asph. = ASPHALT C.–Conc = CONCRETE OBS. = OBSCURED
U/C = UNDER CONSTRUCTION W/L = WATER LEVEL.
WATER QUALITY LEGEND
TECOLOTE CANYONE WATERSHED
MORENA BLVD. WATERSHED
SAN DIEGO RIVER WATERSHED
DRAINAGE BASIN BOUNDARY
DRAINAGE BASIN ID
A1
PREVIOUSLY APPROVED PROJECT ID (REFERENCE CUP 92-0568, SCR 140192 & SCR 104201)
PREVIOUSLY APPROVED PROJECT ID TO BE MODIFIED AS PART OF THIS CUP APPLICATION (REFERENCE CUP 92-0568 & SCR 140192)
PROPOSED PROJECT ID
POINT OF COMPLIANCE
SCALE: 1"=200'
N
DRAINS TO TECOLOTE CANYON
TECOLOTE CANYON
DRAINS TO MORENA BLVD
DRAINS TO SAN DIEGO RIVER
CUSHMAN AVE.
CAMINO WAY
ALCALA PKY.
MARIAN WAY
CAMINO DE LA PAZ
ALCALA PARK
CUSHMAN PLACE
MORENA BLVD.
CAMINO SAN DIEGO
LINDA VISTA RD.
SANTA ANA
SAN DIMAS AVE.
TORERO WAY
VIA LAS CUMBRES
P1
Q1
M1
L1
N1
O1
U2
S1
T1
V1
R1
REFER TO APPENDIX `E'
DRAWING SCALE
200 0 200 400
SCALE IN FEET
GRAPHIC SCALE

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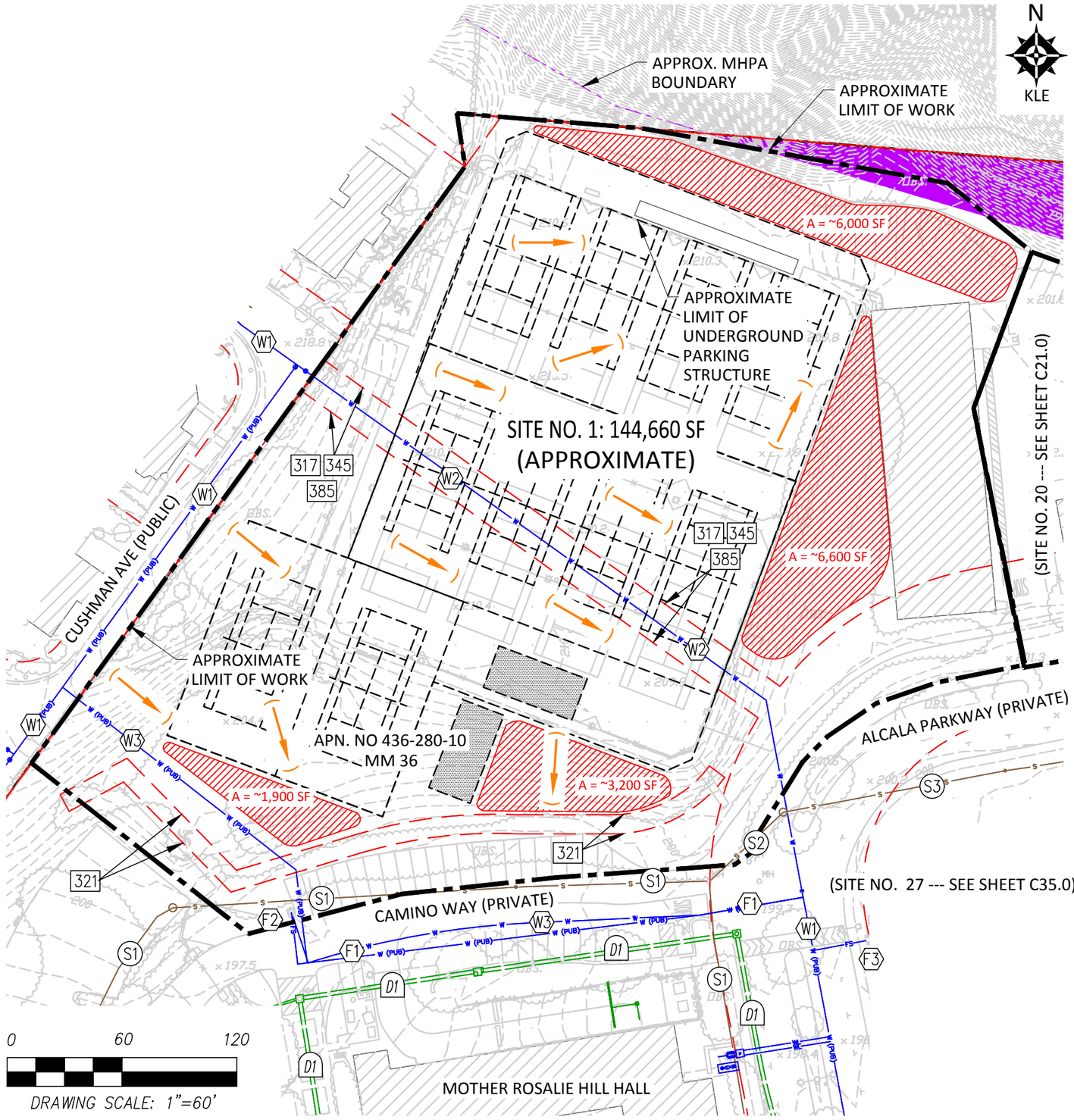
~ USD MASTER PLAN 2015 ~

WATER QUALITY TECHNICAL REPORT SITE MAP

Appendix E Post Construction BMP Candidate Area Exhibits

X:\PROJECTS\0059 - USD MASTER PLAN (MWSO)\ENGR\EXHIBITS\CUP PLANS\DRAWINGS\0059 USD CUP PLANS.DWG (08-11-16 3:59:21PM) Plotted by: Mike



EASEMENT SUMMARY

— — ## SEE EASEMENT SUMMARY AND DESCRIPTION ON SHEETS C3.0 - C11.0.

WET UTILITIES

- —S— S1 EXISTING 6" SEWER MAIN (PRIVATE)
- —S— S2 EXISTING 8" SEWER MAIN (PRIVATE)
- —S— S3 EXISTING 10" SEWER MAIN (PRIVATE)
- —W— W1 EXISTING 8" WATER MAIN (PUBLIC)
- —W— W2 EXISTING 8" WATER MAIN (PUBLIC) (PORTIONS ABANDONED PER DWG. NO. 38090-D)
- —W— W3 EXISTING 12" WATER MAIN (PUBLIC)
- —F— F1 EXISTING FIRE SERVICE (PRIVATE)
- —F— F2 EXISTING FIRE HYDRANT (PRIVATE)
- —F— F3 EXISTING FIRE HYDRANT (PUBLIC)

DRAINAGE

- —SD— D1 EXISTING 12" STORM DRAIN (PRIVATE)
- (→) DIRECTION OF EXISTING STORMWATER FLOW

STORM WATER

- PERVIOUS/IMPERVIOUS AREA

EXISTING: IMPERVIOUS AREA = 87,960 SF
PERVIOUS AREA = 56,700 SF

PROPOSED: IMPERVIOUS AREA = 81,660 SF
(BUILDING FOOTPRINT = 75,000 SF)
PERVIOUS AREA = 63,000 SF

DELTA: APPROXIMATE ANTICIPATED
IMPERVIOUS AREA DECREASE = 6,300 SF

CANDIDATE BIORETENTION BASIN AREAS (MIN. AREA ~ 17,700 SF)

- WATER QUALITY & HYDROMODIFICATION

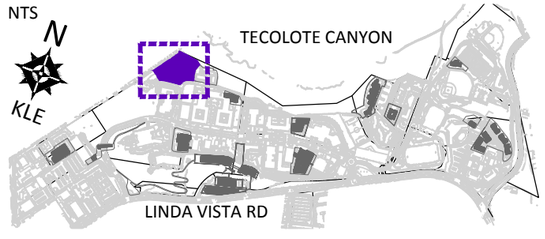
(REFER TO SHEET C33.0 FOR PRELIMINARY CALCULATIONS)
(SEE "TECHNICAL STUDIES" NOTES ON SHEET C2.0)

PRIOR APPROVAL NOTE

THIS PROJECT WAS PREVIOUSLY APPROVED AS THE SPORT PARK PER CONDITIONAL USE PERMIT NO. 92-0568 (IDENTIFIED AS PROJECT NO. 11 IN THE 1996 USD MASTER PLAN). THIS PROJECT PROPOSES MODIFICATIONS TO BE INCLUDED IN THIS CONDITIONAL USE PERMIT.

KEY MAP

NTS



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PROJECT NO. SITE NO. 1

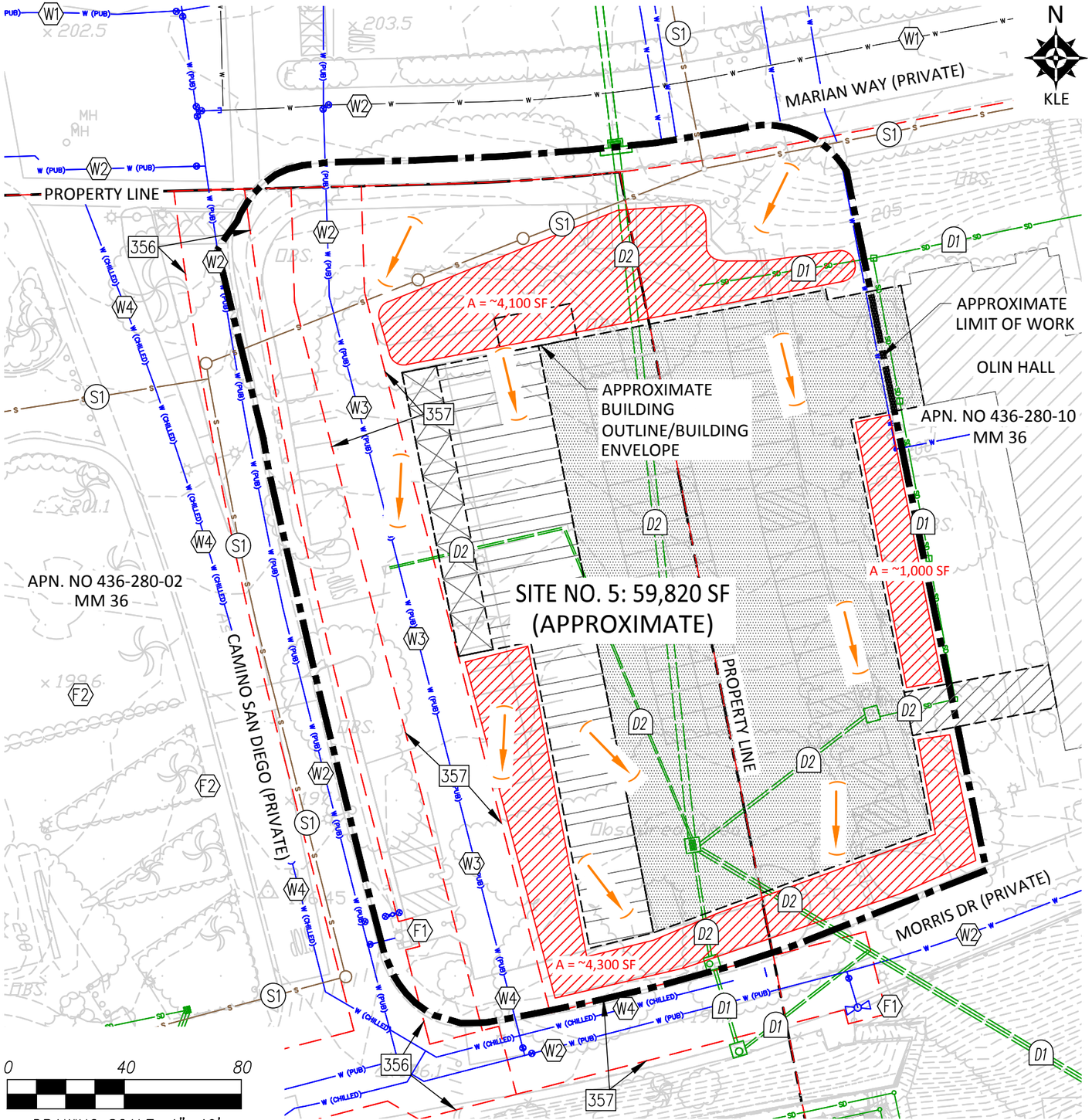
REVISIONS

1	06.30.15	MIR SUBMITTAL
2	10.30.15	1st CUP SUBMITTAL
3	03.07.16	2nd CUP SUBMITTAL
4	06.09.16	ADDED BIO-BASINS
5	08.22.16	3RD CITY SUBMITTAL

Job No. KLE 0059

Sheet No. C15.0

X:\PROJECTS\0059 - USD MASTER PLAN (MWSG)\ENGR\EXHIBITS\CUP PLANS\DRAWINGS\0059_USD_CUP_PLANS.DWG (08-11-16 4:09:54PM) Plotted by: Mike



EASEMENT SUMMARY

- ## — SEE EASEMENT SUMMARY AND DESCRIPTION ON SHEETS C3.0 - C11.0.

WET UTILITIES

- S — S1 — EXISTING 8" SEWER MAIN (PRIVATE)
- W — W1 — EXISTING 8" WATER MAIN (PUBLIC)
- W — W2 — EXISTING 12" WATER MAIN (PUBLIC)
- W — W3 — EXISTING 12" WATER MAIN (PUBLIC) (PORTIONS TO BE REMOVED/RELOCATED)
- W — W4 — EXISTING CHILLED WATER (PRIVATE)
- F — F1 — EXISTING FIRE HYDRANT (PUBLIC)
- F — F2 — EXISTING FIRE SERVICE (PRIVATE)

DRAINAGE

- SD — D1 — EXISTING STORM DRAIN (PRIVATE)
- SD — D2 — EXISTING STORM DRAIN (PRIVATE) (PORTIONS TO BE REMOVED/RELOCATED)
- (→) DIRECTION OF EXISTING STORMWATER FLOW

STORM WATER

- PERVIOUS/IMPERVIOUS AREA

EXISTING: IMPERVIOUS AREA = 51,760 SF
PERVIOUS AREA = 8,060 SF
PROPOSED: IMPERVIOUS AREA = 45,560 SF
(BUILDING FOOTPRINT = 29,300 SF)
PERVIOUS AREA = 15,260 SF
DELTA: APPROXIMATE ANTICIPATED
IMPERVIOUS AREA DECREASE = 6,200 SF

CANDIDATE BIORETENTION BASIN AREAS (MIN. AREA ~ 9,400 SF)

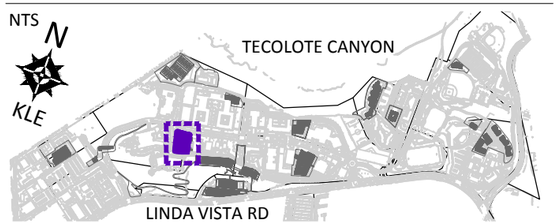
- WATER QUALITY & HYDROMODIFICATION

(REFER TO SHEET C33.0 FOR PRELIMINARY CALCULATIONS)
(SEE "TECHNICAL STUDIES" NOTES ON SHEET C2.0)

PRIOR APPROVAL NOTE

THIS PROJECT WAS PREVIOUSLY APPROVED AS THE SCHOOL OF BUSINESS PER CONDITIONAL USE PERMIT NO. 92-0568 (IDENTIFIED AS PROJECT NO. 4 IN THE 1996 USD MASTER PLAN). THIS PROJECT PROPOSES MODIFICATIONS TO BE INCLUDED IN THIS CONDITIONAL USE PERMIT.

KEY MAP



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PROJECT NO. SITE NO. 5

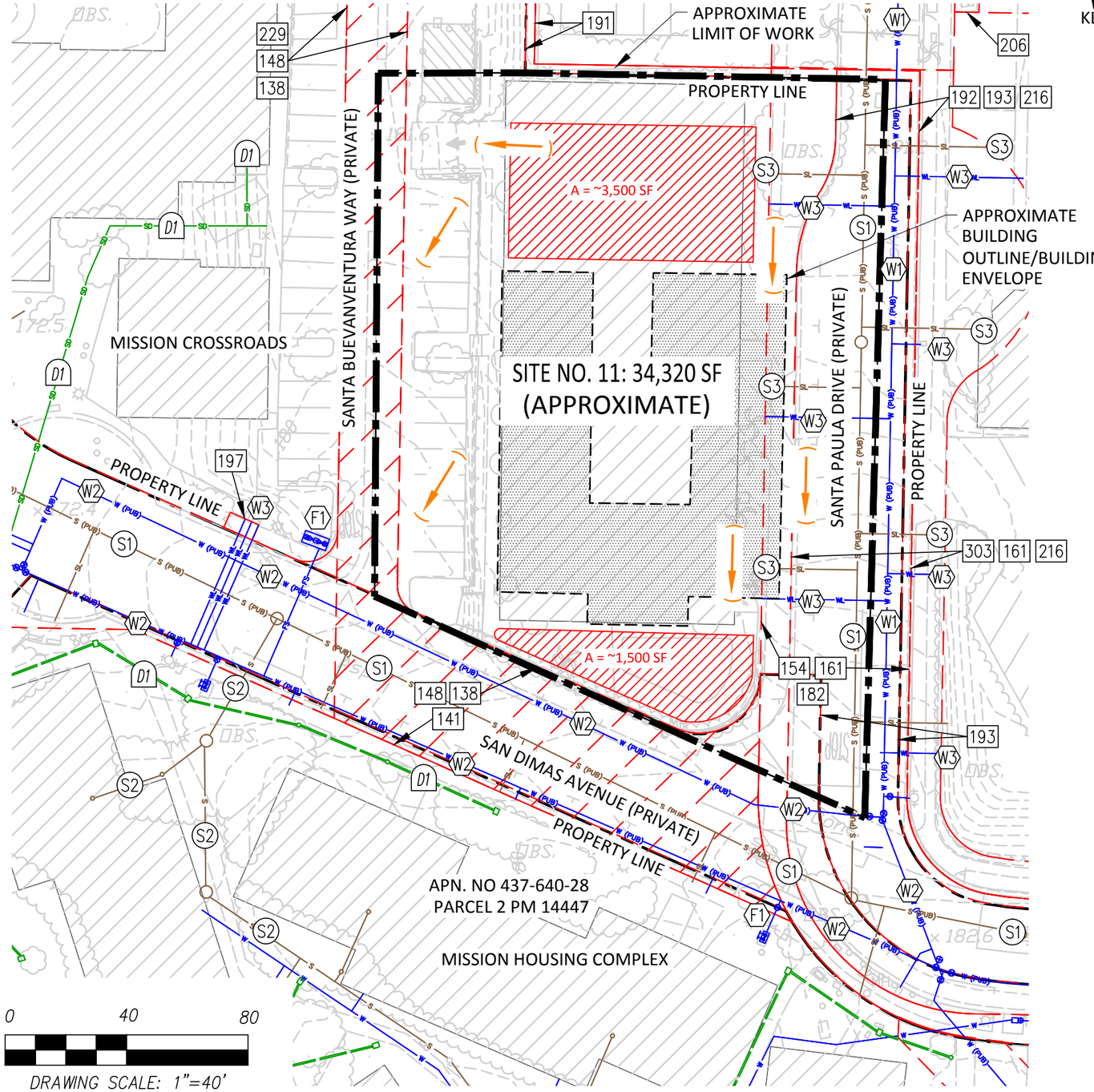
REVISIONS

1	06.30.15	MIR SUBMITTAL
2	10.30.15	1st CUP SUBMITTAL
3	03.07.16	2nd CUP SUBMITTAL
4	06.09.16	ADDED BIO-BASINS
5	08.22.16	3RD CITY SUBMITTAL

Job No. KLE 0059

Sheet No.

C16.0



EASEMENT SUMMARY

- ## — SEE EASEMENT SUMMARY AND DESCRIPTION ON SHEETS C3.0 - C11.0.

WET UTILITIES

- S1 — EXISTING 8" SEWER MAIN (PUBLIC)
- S2 — EXISTING PRIVATE SEWER MAIN (PRIVATE)
- S3 — EXISTING SEWER LATERAL (PRIVATE)
- W1 — EXISTING 8" WATER MAIN (PUBLIC)
- W2 — EXISTING 12" WATER MAIN (PUBLIC)
- W3 — EXISTING WATER SERVICES (PRIVATE)
- F1 — EXISTING FIRE SERVICE (PRIVATE)

DRAINAGE

- D1 — EXISTING STORM DRAIN (SIZE VARIES) (PRIVATE)
- DIRECTION OF EXISTING STORMWATER FLOW

STORM WATER

- PERVIOUS/IMPERVIOUS AREA

EXISTING: IMPERVIOUS AREA = 30,580 SF
PERVIOUS AREA = 3,740 SF

PROPOSED: IMPERVIOUS AREA = 23,920 SF
(BUILDING FOOTPRINT = 8,000 SF)
PERVIOUS AREA = 10,400 SF

DELTA: APPROXIMATE ANTICIPATED
IMPERVIOUS AREA DECREASE = 6,660 SF

CANDIDATE BIORETENTION BASIN AREAS (MIN. AREA ~ 5,000 SF)

- WATER QUALITY & HYDROMODIFICATION

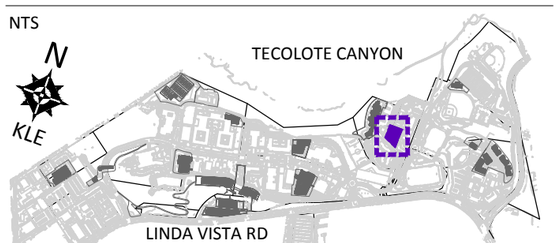
(REFER TO SHEET C33.0 FOR PRELIMINARY CALCULATIONS)
(SEE "TECHNICAL STUDIES" NOTES ON SHEET C2.0)

PRIOR APPROVAL NOTE

THIS PROJECT WAS PREVIOUSLY APPROVED AS MISSION APARTMENTS RENNOVATION PER CONDITIONAL USE PERMIT NO. 92-0568 (IDENTIFIED AS PROJECT NO. 15 IN THE 1996 USD MASTER PLAN). THIS PROJECT PROPOSES MODIFICATIONS TO BE INCLUDED IN THIS CONDITIONAL USE PERMIT.

KEY MAP

NTS



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PROJECT NO. SITE NO. 11

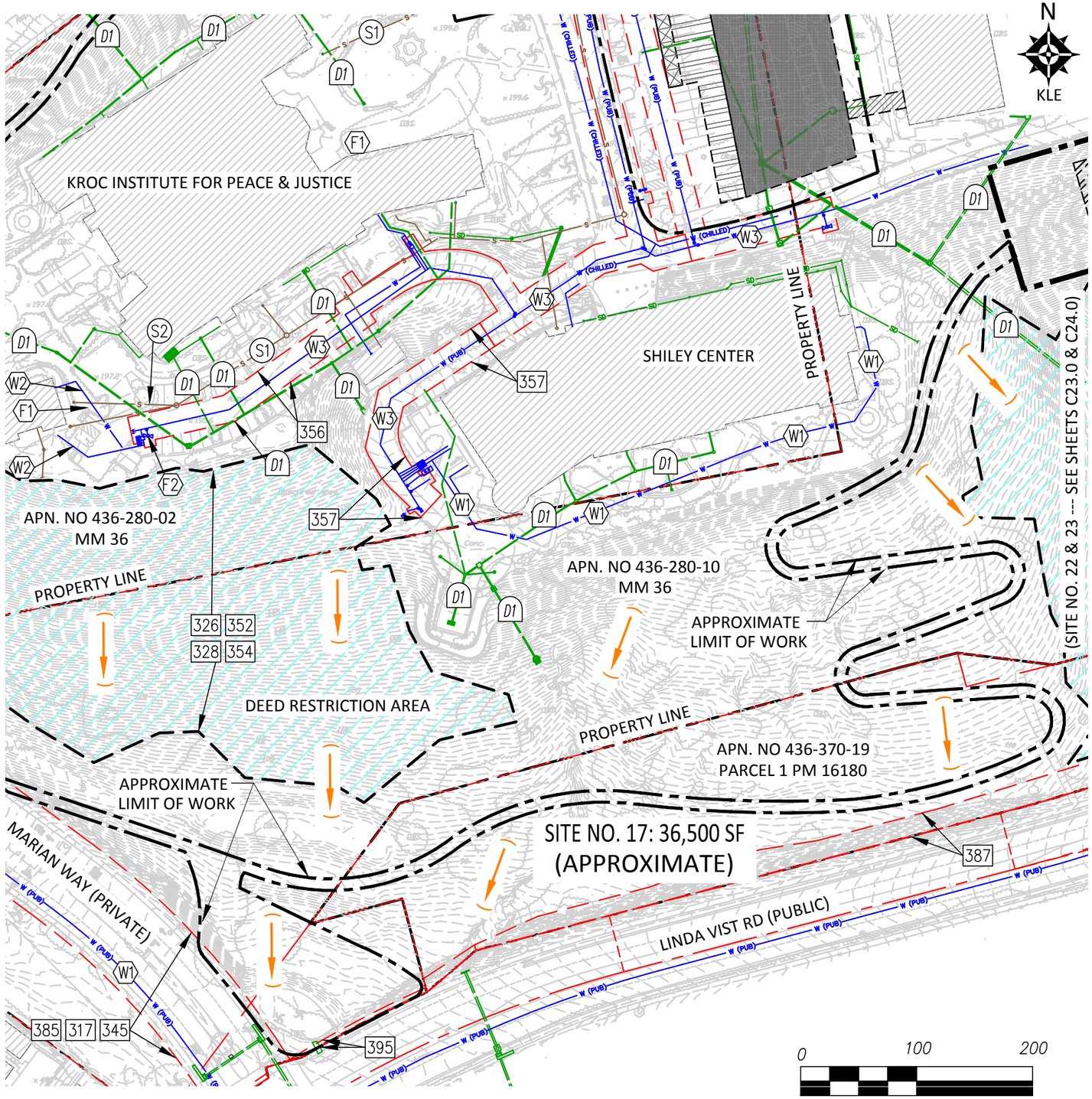
REVISIONS

1	06.30.15	MIR SUBMITTAL
2	10.30.15	1st CUP SUBMITTAL
3	03.07.16	2nd CUP SUBMITTAL
4	06.09.16	ADDED BIO-BASINS
5	08.22.16	3RD CITY SUBMITTAL

Job No. KLE 0059

Sheet No. C17.0

X:\PROJECTS\0059 - USD MASTER PLAN (MWSO)\ENGR\EXHIBITS\CUP PLANS\DRAWINGS\0059 USD CUP PLANS.DWG (08-11-16 1:35:03PM) Plotted by: Mike



EASEMENT SUMMARY

- — — ## SEE EASEMENT SUMMARY AND DESCRIPTION ON SHEETS C3.0 - C11.0.

WET UTILITIES

- —S— S1 EXISTING SEWER MAIN (PRIVATE)
- —S— S2 EXISTING SEWER LATERAL (PRIVATE)
- —W— W1 EXISTING 12" WATER MAIN (PUBLIC)
- —W— W2 EXISTING WATER SERVICE (PRIVATE)
- —W— W3 EXISTING 8" WATER MAIN (PUBLIC)
- —F— F1 EXISTING FIRE SERVICES (PRIVATE)
- —F— F2 EXISTING FIRE HYDRANT (PUBLIC)

DRAINAGE

- —SD— D1 EXISTING STORM DRAIN (PRIVATE)
- (→) DIRECTION OF EXISTING STORMWATER FLOW

STORM WATER

- WATER QUALITY
  DESCRIPTION: N/A
  OPTIONS: N/A
- HYDROMODIFICATION
  DESCRIPTION: N/A
  OPTIONS: N/A

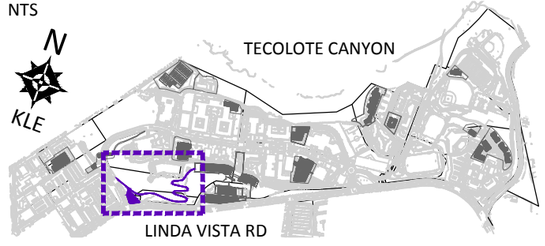
NOTE: PROJECT PROPOSES TO INSTALL A DG TRAIL ONLY, AND THEREFORE, NOT A POLLUTANT GENERATING PROJECT. AS DEFINED IN THE CITY OF SAN DIEGO STORM WATER APPLICABILITY CHECKLIST, "CALCULATIONS OF THE SQUARE FOOTAGE OF IMPERVIOUS SURFACES NEED NOT INCLUDE LINEAR PATHWAYS THAT ARE FOR INFREQUENT VEHICULAR USE, SUCH AS EMERGENCY MAINTENANCE ACCESS OR BICYCLE PEDESTRIAN USE IF THEY ARE BUILT WITH PERVIOUS SURFACES OR IF THEY SHEET FLOW TO SURROUNDING PERVIOUS SURFACES."

NOTES

SEE "TECHNICAL STUDIES" NOTES ON SHEET C2.0.

KEY MAP

NTS



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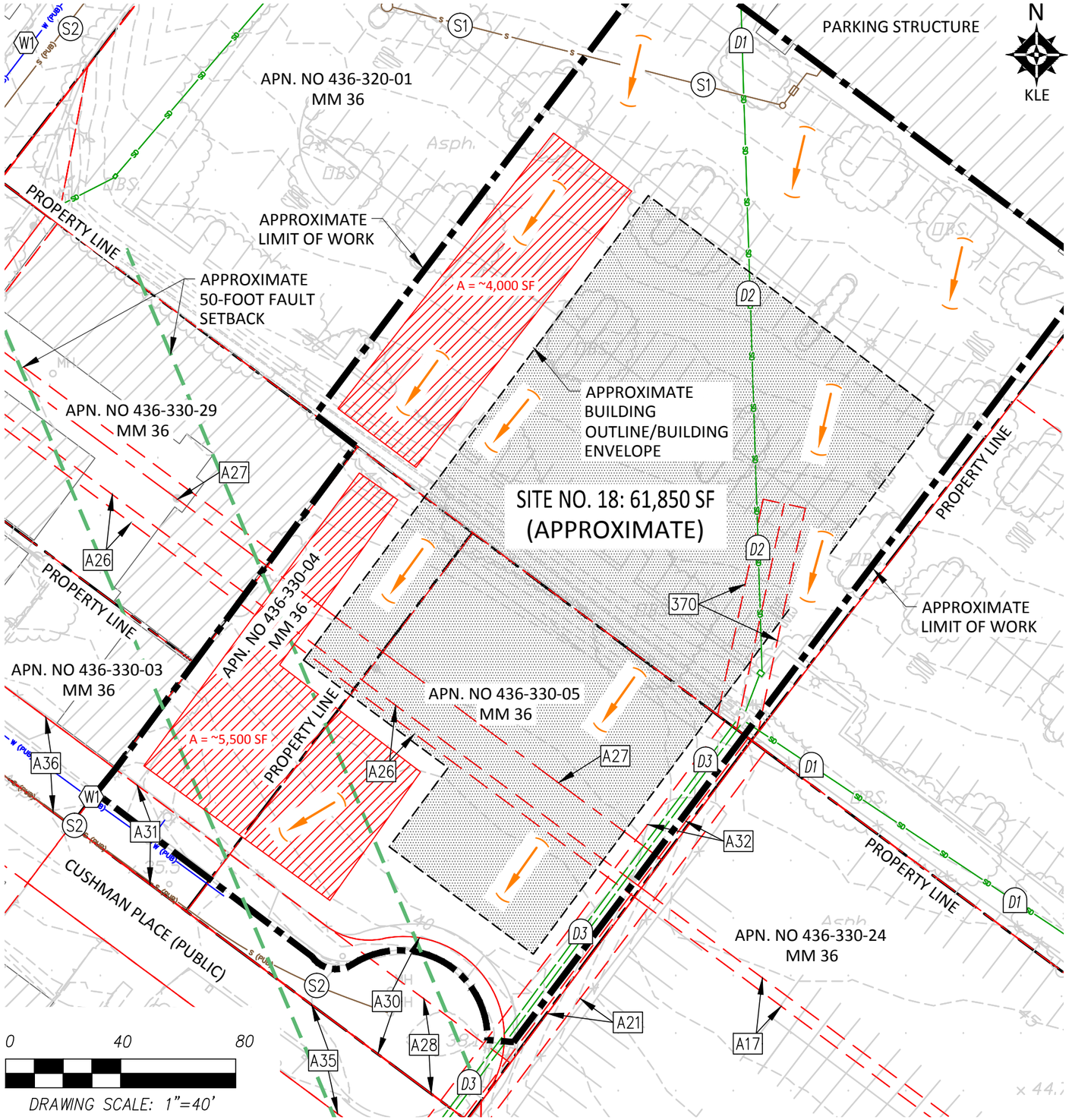
PROJECT NO. SITE NO. 17

REVISIONS

1	06.30.15	MIR SUBMITTAL
2	10.30.15	1st CUP SUBMITTAL
3	03.07.16	2nd CUP SUBMITTAL
4	06.09.16	ADDED BIO-BASINS
5	08.22.16	3RD CITY SUBMITTAL

Job No. KLE 0059

Sheet No.
C18.0



EASEMENT SUMMARY

— — ## SEE EASEMENT SUMMARY AND DESCRIPTION ON SHEETS C3.0 - C11.0.

WET UTILITIES

—S— S1 EXISTING SEWER LATERAL (PRIVATE)

—S— S2 EXISTING 8" SEWER MAIN (PUBLIC)

—W— W1 EXISTING 6" WATER MAIN (PUBLIC)

DRAINAGE

—SD— D1 EXISTING STORM DRAIN (PRIVATE)

—SD— D2 EXISTING STORM DRAIN (PRIVATE) (PORTIONS TO BE REMOVED/RELOCATED)

—SD— D3 EXISTING 24" STORM DRAIN (PUBLIC)

(→) DIRECTION OF EXISTING STORMWATER FLOW

STORM WATER

- PERVIOUS/IMPERVIOUS AREAS

EXISTING: IMPERVIOUS AREA = 34,500 SF
PERVIOUS AREA = 27,350 SF

PROPOSED: IMPERVIOUS AREA = 44,525 SF
(BUILDING FOOTPRINT = 27,200 SF)
PERVIOUS AREA = 17,325 SF

DELTA: APPROXIMATE ANTICIPATED
IMPERVIOUS AREA INCREASE = 10,025 SF

CANDIDATE BIORETENTION BASIN AREAS (MIN. AREA ~ 9,500 SF)

- WATER QUALITY & HYDROMODIFICATION

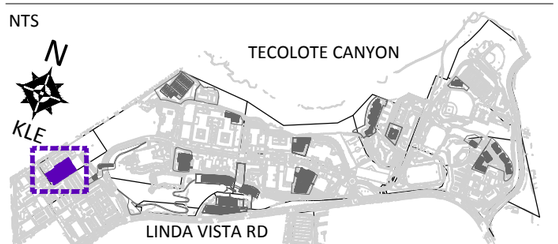
(REFER TO SHEET C34.0 FOR PRELIMINARY CALCULATIONS)
(SEE "TECHNICAL STUDIES" NOTES ON SHEET C2.0)

OFFSITE IMPROVEMENTS

REFER TO SHEET C1.1 FOR OFFSITE IMPROVEMENTS REQUIRED FOR PROJECT NO. 18.

KEY MAP

NTS



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PROJECT NO. SITE NO. 18

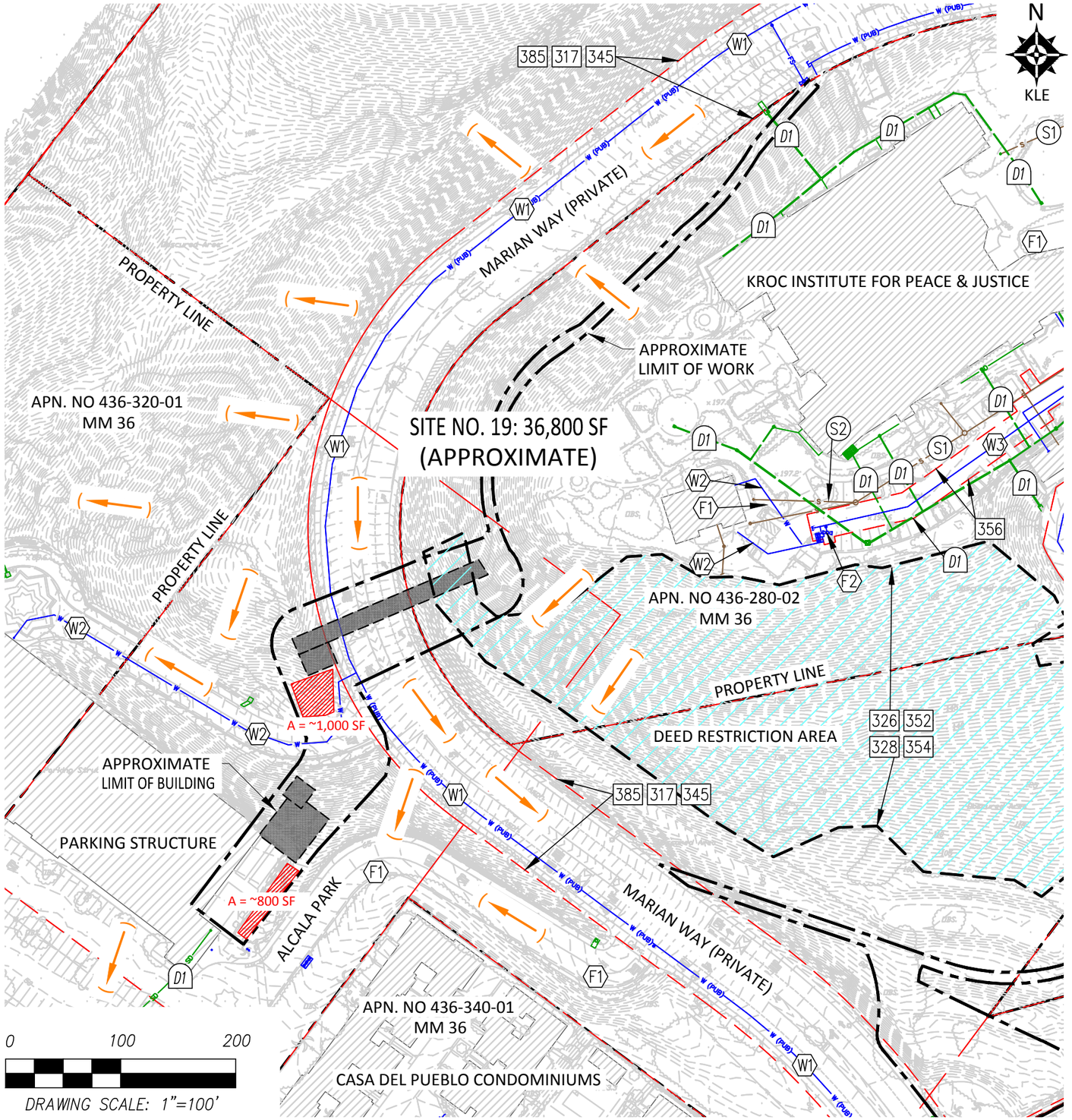
REVISIONS

1	06.30.15	MIR SUBMITTAL
2	10.30.15	1st CUP SUBMITTAL
3	03.07.16	2nd CUP SUBMITTAL
4	06.09.16	ADDED BIO-BASINS
5	08.22.16	3RD CITY SUBMITTAL

Job No. KLE 0059

Sheet No.
C19.0

X:\PROJECTS\0059 — USD MASTER PLAN (MWSG)\ENGR\EXHIBITS\CUP PLANS\DRAWINGS\0059 USD CUP PLANS.DWG (08—11—16 1:37:43PM) Plotted by: Mike



EASEMENT SUMMARY

— — ## SEE EASEMENT SUMMARY AND DESCRIPTION ON SHEETS C3.0 - C11.0.

WET UTILITIES

- —S— S1 EXISTING SEWER MAIN (PRIVATE)
- —S— S2 EXISTING SEWER LATERAL (PRIVATE)
- —W— W1 EXISTING 12" WATER MAIN (PUBLIC)
- —W— W2 EXISTING WATER SERVICE (PRIVATE)
- —W— W3 EXISTING 8" WATER MAIN (PUBLIC)
- —F— F1 EXISTING FIRE SERVICES (PRIVATE)
- —F— F2 EXISTING FIRE HYDRANT (PUBLIC)

DRAINAGE

- —SD— D1 EXISTING STORM DRAIN (PRIVATE)
- (→) DIRECTION OF EXISTING STORMWATER FLOW

STORM WATER

- PERVIOUS/IMPERVIOUS AREAS

EXISTING: IMPERVIOUS AREA = 11,900 SF
PERVIOUS AREA = 24,900 SF

PROPOSED: IMPERVIOUS AREA = 15,700 SF
(BUILDING FOOTPRINT = 5,000 SF)
PERVIOUS AREA = 36,800 SF

DELTA: APPROXIMATE ANTICIPATED
IMPERVIOUS AREA INCREASE = 3,800 SF

CANDIDATE BIORETENTION BASIN AREAS
(MIN. AREA ~ 1,800 SF)

- WATER QUALITY & HYDROMODIFICATION

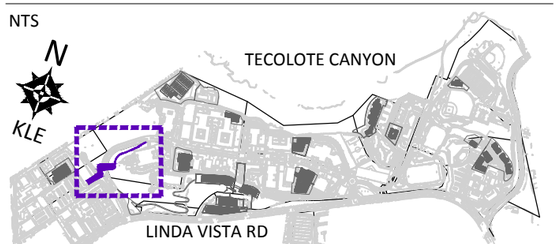
(REFER TO SHEET C34.0 FOR PRELIMINARY CALCULATIONS)
(SEE "TECHNICAL STUDIES" NOTES ON SHEET C2.0)

NOTES

SEE "TECHNICAL STUDIES" NOTES ON SHEET C2.0.

KEY MAP

NTS



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PROJECT NO. SITE NO. 19

REVISIONS

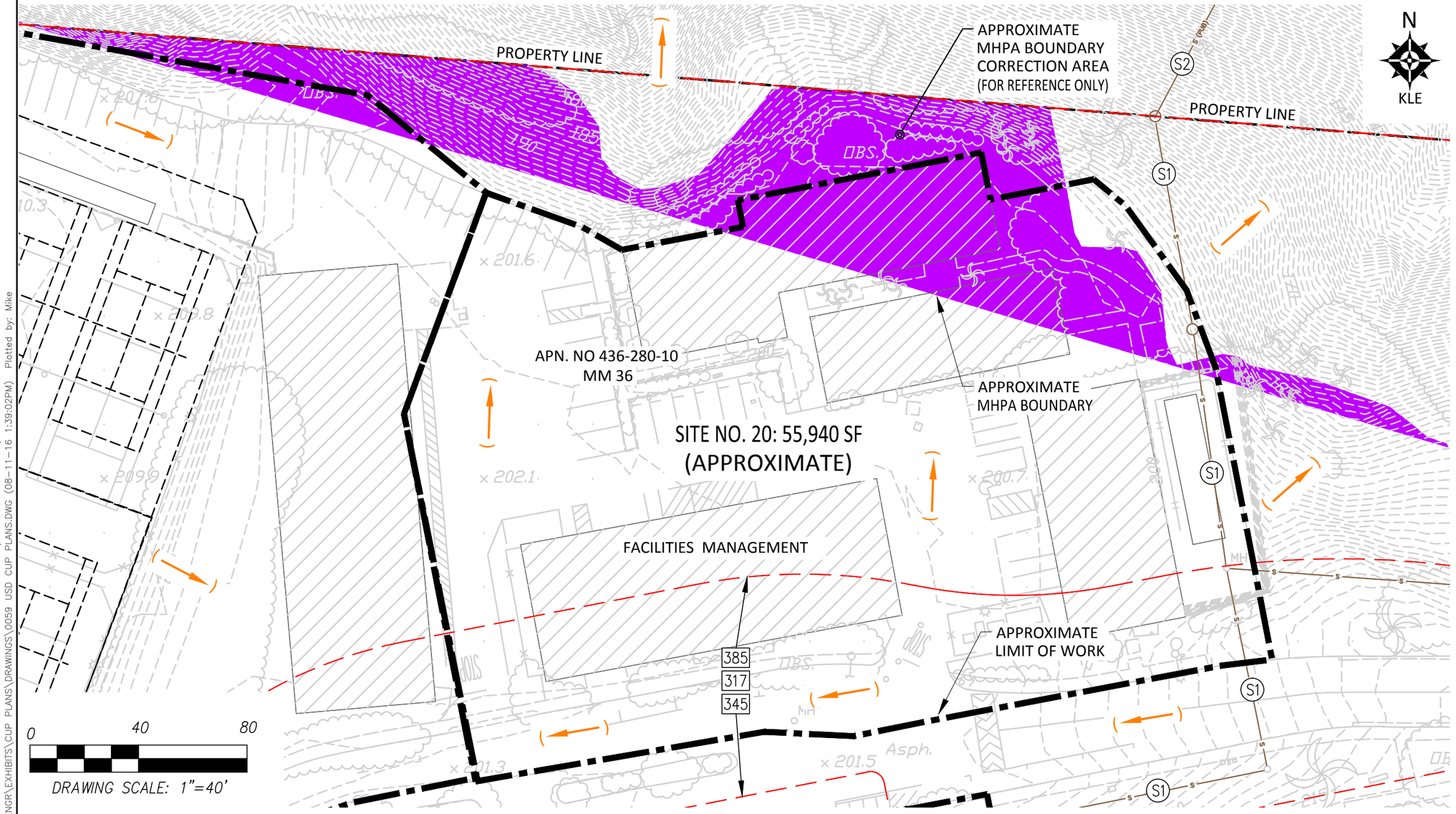
1	06.30.15	MIR SUBMITTAL
2	10.30.15	1st CUP SUBMITTAL
3	03.07.16	2nd CUP SUBMITTAL
4	06.09.16	ADDED BIO-BASINS
5	08.22.16	3RD CITY SUBMITTAL

Job No. KLE 0059

Sheet No.

C20.0

X:\PROJECTS\0059 - USD MASTER PLAN (MMSG)\ENGR\EXHIBITS\CUP PLANS\DRAWINGS\0059 USD CUP PLANS.DWG (08-11-16 1:39:02PM) Plotted by: Mike



EASEMENT SUMMARY

— — ## SEE EASEMENT SUMMARY AND DESCRIPTION ON SHEETS C3.0 - C11.0.

WET UTILITIES

—S— S1 EXISTING SEWER MAIN (PRIVATE)

—S— S2 EXISTING SEWER MAIN (PUBLIC)

—W— W1 N/A

DRAINAGE

—SD— D1 N/A

(→) DIRECTION OF EXISTING STORMWATER FLOW

NOTES

SEE "TECHNICAL STUDIES" NOTES ON SHEET C2.0.

STORM WATER

- WATER QUALITY

DESCRIPTION: N/A
OPTIONS: N/A

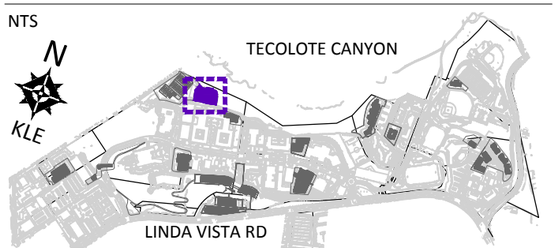
- HYDROMODIFICATION

DESCRIPTION: N/A
OPTIONS: N/A

NOTE: PROJECT PROPOSES TO MOVE INTERNAL BUILDING FUNCTIONS ONLY AND DOES NOT CREATE ANY NEW IMPERVIOUS AREAS OR LAND DISTURBANCES. THEREFORE, NOT A POLLUTANT GENERATING PROJECT OR A PRIORITY DEVELOPMENT PROJECT.

KEY MAP

NTS



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PROJECT NO. SITE NO. 20

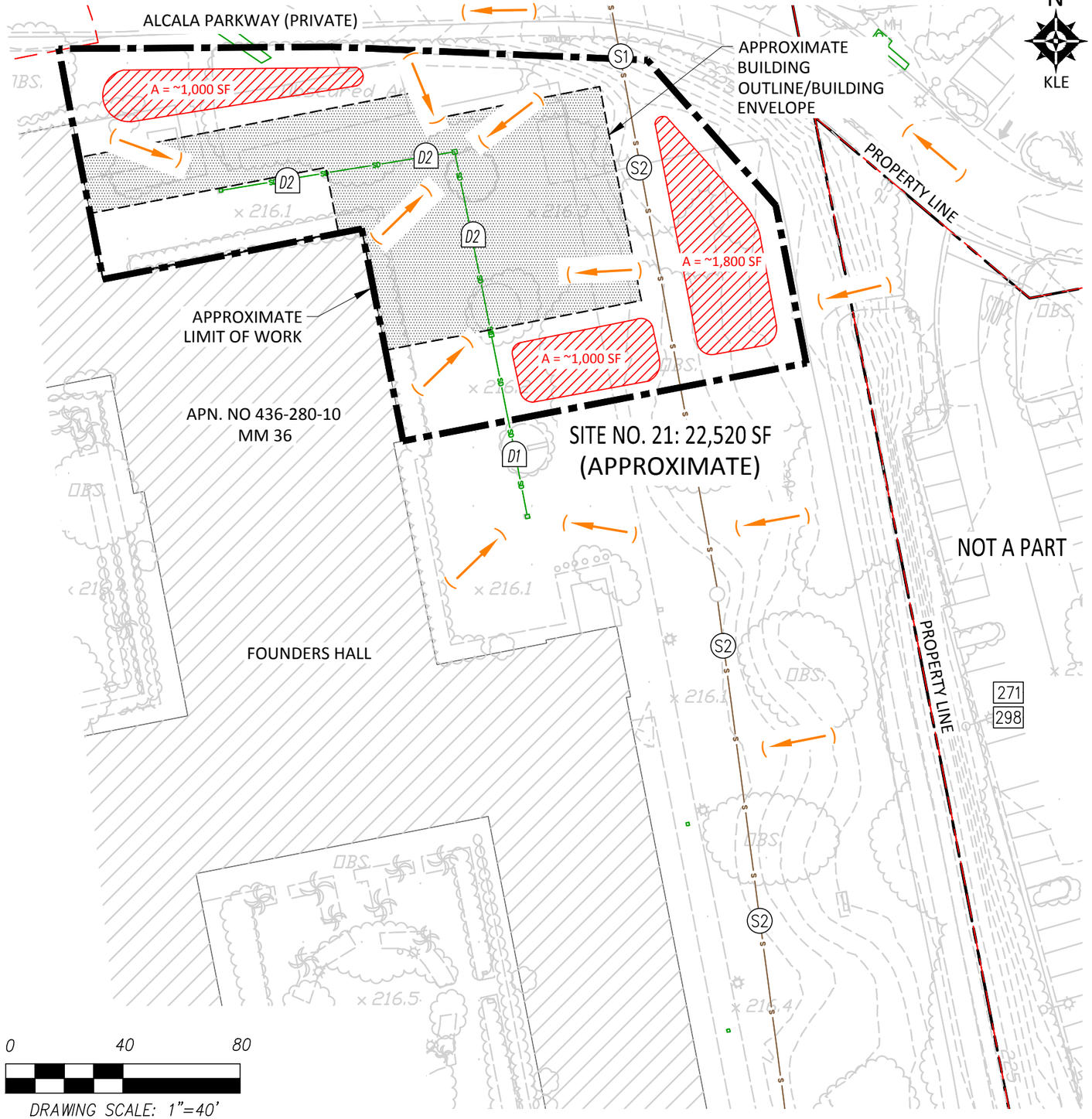
REVISIONS

1	06.30.15	MIR SUBMITTAL
2	10.30.15	1st CUP SUBMITTAL
3	03.07.16	2nd CUP SUBMITTAL
4	06.09.16	ADDED BIO-BASINS
5	08.22.16	3RD CITY SUBMITTAL

Job No. KLE 0059

Sheet No.

C21.0



EASEMENT SUMMARY

— — ## SEE EASEMENT SUMMARY AND DESCRIPTION ON SHEETS C3.0 - C11.0.

WET UTILITIES

—S— S1 EXISTING SEWER MAIN (PRIVATE)

—S— S2 EXISTING SEWER MAIN (PRIVATE) (PORTIONS TO BE REMOVED/RELOCATED)

—W— W1 N/A

DRAINAGE

—SD— D1 EXISTING STORM DRAIN (PRIVATE)

—SD— D2 EXISTING STORM DRAIN (PRIVATE) (PORTIONS TO BE REMOVED/RELOCATED)

(→) DIRECTION OF EXISTING STORMWATER FLOW

STORM WATER

- PERVIOUS/IMPERVIOUS AREA

EXISTING: IMPERVIOUS AREA = 18,030 SF
PERVIOUS AREA = 4,490 SF

PROPOSED: IMPERVIOUS AREA = 18,464 SF
(BUILDING FOOTPRINT = 9,000 SF)
PERVIOUS AREA = 4,056 SF

DELTA: APPROXIMATE ANTICIPATED IMPERVIOUS AREA INCREASE = 434 SF

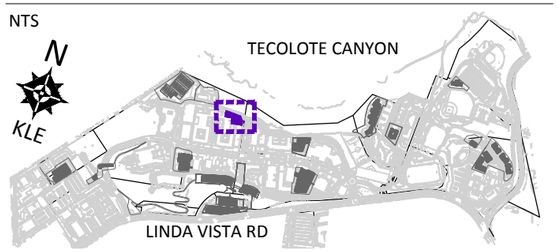
CANDIDATE BIORETENTION BASIN AREAS (MIN. AREA ~ 3,800 SF)

- WATER QUALITY & HYDROMODIFICATION

(REFER TO SHEET C34.0 FOR PRELIMINARY CALCULATIONS)
(SEE "TECHNICAL STUDIES" NOTES ON SHEET C2.0)

KEY MAP

NTS



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PROJECT NO. SITE NO. 21

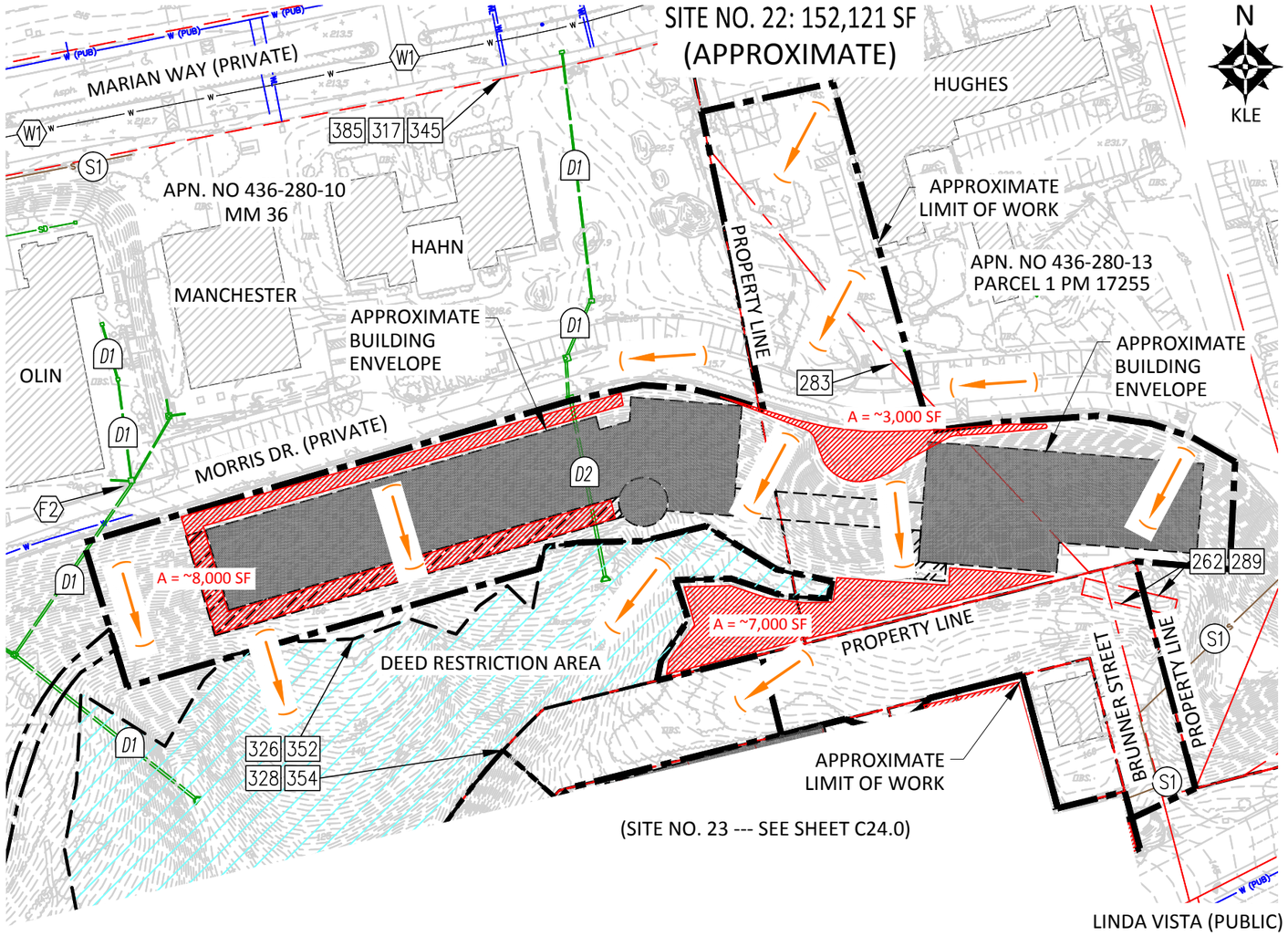
REVISIONS

1	06.30.15	MIR SUBMITTAL
2	10.30.15	1st CUP SUBMITTAL
3	03.07.16	2nd CUP SUBMITTAL
4	06.09.16	ADDED BIO-BASINS
5	08.22.16	3RD CITY SUBMITTAL

Job No. KLE 0059

Sheet No.

C22.0



0 100 200

DRAWING SCALE: 1"=100'

EASEMENT SUMMARY

— — ## SEE EASEMENT SUMMARY AND DESCRIPTION ON SHEETS C3.0 - C11.0.

WET UTILITIES

- —S— S1 EXISTING SEWER MAIN (PRIVATE)
- —W— W1 EXISTING 8" WATER MAIN (PUBLIC)
- —F— F1 EXISTING FIRE HYDRANT (PUBLIC)
- —F— F2 EXISTING FIRE HYDRANT (PRIVATE)

DRAINAGE

- —SD— D1 EXISTING STORM DRAIN (PRIVATE)
- —SD— D2 EXISTING STORM DRAIN (PRIVATE) (PORTIONS TO BE REMOVED/RELOCATED)
- (→) DIRECTION OF EXISTING STORMWATER FLOW

STORM WATER

- PERVIOUS/IMPERVIOUS AREA

EXISTING: IMPERVIOUS AREA = 26,169 SF
PERVIOUS AREA = 125,952 SF

PROPOSED: IMPERVIOUS AREA = 82,000 SF
(BUILDING FOOTPRINT = 50,000 SF)
PERVIOUS AREA = 70,121 SF

DELTA: APPROXIMATE ANTICIPATED
IMPERVIOUS AREA INCREASE = 55,831 SF

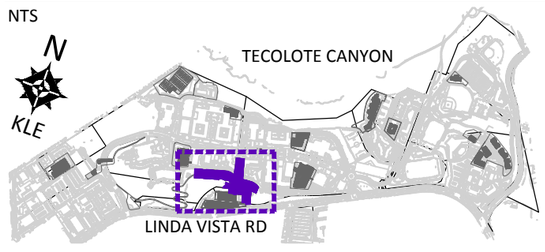
CANDIDATE BIORETENTION BASIN AREAS (MIN. AREA ~ 18,000 SF)

- WATER QUALITY & HYDROMODIFICATION

(REFER TO SHEET C35.0 FOR PRELIMINARY CALCULATIONS)
(SEE "TECHNICAL STUDIES" NOTES ON SHEET C2.0)

KEY MAP

NTS



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PROJECT NO. SITE NO. 22

REVISIONS

1	06.30.15	MIR SUBMITTAL
2	10.30.15	1st CUP SUBMITTAL
3	03.07.16	2nd CUP SUBMITTAL
4	06.09.16	ADDED BIO-BASINS
5	08.22.16	3RD CITY SUBMITTAL

Job No. KLE 0059

Sheet No. C23.0

X:\PROJECTS\0059 - USD MASTER PLAN (MWSG)\ENGR\EXHIBITS\CUP PLANS\DRAWINGS\0059 USD CUP PLANS.DWG (08-11-16 1:41:43PM) Plotted by: Mike

PORTION OF PUBLIC RIGHT-OF-WAY VACATION (APPROXIMATE) PER DOC. NO. 1984-149496 (RESOLUTION NO. 260424) (DRAWING NO. 16029-B)

PROPERTY CURRENTLY OWNED BY: LAGUARDIA REVOCABLE TRUST

DEED RESTRICTION AREA

326 352
328 354

APPROXIMATE BUILDING OUTLINE/BUILDING ENVELOPE

APPROXIMATE LIMIT OF WORK

(SITE NO. 22 --- SEE SHEET C23.0)

PROPERTY LINE

60'

50'

N.A.P

APN. NO 436-280-10

APN. NO 436-390-03

APN. NO 436-390-19

436-390-02

436-390-04

436-390-05

436-390-06

436-390-11

436-390-20

A = ~6,500 SF

A = ~2,500 SF

A = ~2,500 SF

A = ~1,000 SF

SITE NO. 23: 74,542 SF (APPROXIMATE)

BRUNNER STREET

JOSEPHINE STREET

LINDA VISTA ROAD (PUBLIC)

COLUSA ST. (PUBLIC)

APPROXIMATE BUILDING ENVELOPE

APPROXIMATE BUILDING ENVELOPE

400

399

(*)

(**)

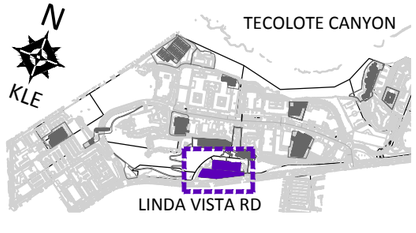
0 60 120

DRAWING SCALE: 1"=60'

N

KLE

KEY MAP



LEGEND

CANDIDATE BIORETENTION BASIN AREAS (MIN. AREA ~ 12,500 SF)

- WATER QUALITY & HYDROMODIFICATION

(REFER TO SHEET C35.0 FOR PRELIMINARY CALCULATIONS)
(SEE "TECHNICAL STUDIES" NOTES ON SHEET C2.0)

REPRESENTS PORTION OF PUBLIC RIGHT-OF-WAY VACATION PER DOC. NO. 1984-149496 (RESOLUTION NO. 260424) (DRAWING NO. 16029-B)

OFFSITE IMPROVEMENTS

(*) EXISTING CURB RETURNS TO REMAIN (I.E. INTERSECTION OF PUBLIC STREET WITH PUBLIC STREET)

(**) REFER TO SHEET C1.1 FOR OFFSITE IMPROVEMENTS REQUIRED FOR PROJECT NO. 23.

EASEMENT SUMMARY

—— ## SEE EASEMENT SUMMARY AND DESCRIPTION ON SHEETS C3.0 - C11.0.

WET UTILITIES

—S— S1 EXISTING 8" SEWER MAIN (PUBLIC)

—S— S2 EXISTING SEWER LATERAL (PRIVATE)

—W— W1 EXISTING 8" WATER MAIN (PUBLIC)

—W— W2 EXISTING WATER SERVICE (PRIVATE)

—F— F1 EXISTING FIRE HYDRANT (PUBLIC)

DRAINAGE

—SD— D1 N/A

(——→) DIRECTION OF EXISTING STORMWATER FLOW

STORM WATER

- PERVIOUS/IMPERVIOUS AREA

EXISTING: IMPERVIOUS AREA = 37,626 SF
PERVIOUS AREA = 36,916 SF

PROPOSED: IMPERVIOUS AREA = 59,000 SF
(BUILDING FOOTPRINT = 49,000 SF)
PERVIOUS AREA = 15,542 SF

DELTA: APPROXIMATE ANTICIPATED IMPERVIOUS AREA INCREASE = 21,374 SF

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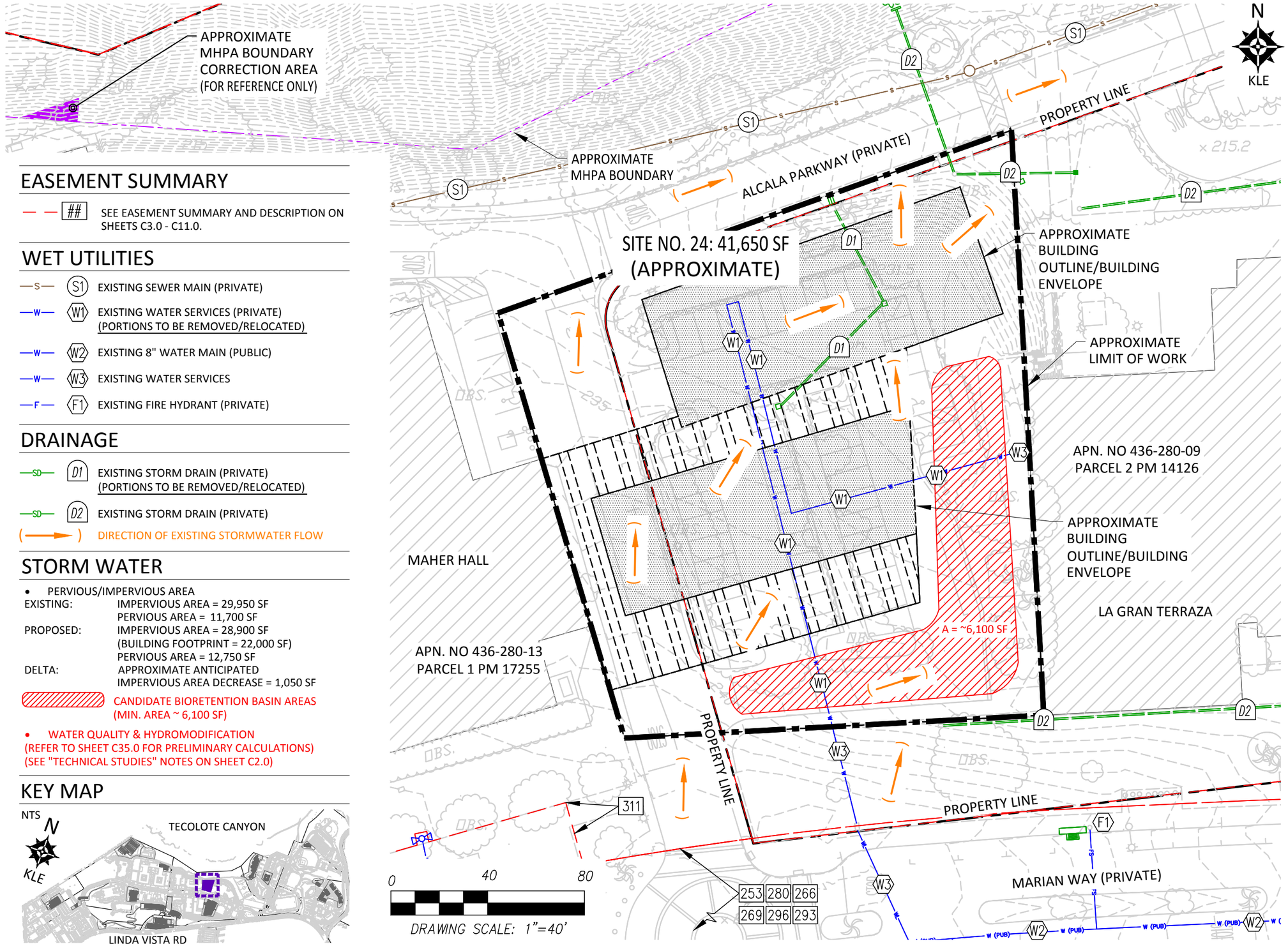
1	06.30.15	MIR SUBMITTAL
2	10.30.15	1st CUP SUBMITTAL
3	03.07.16	2nd CUP SUBMITTAL
4	06.09.16	ADDED BIO-BASINS
5	08.22.16	3RD CITY SUBMITTAL

Job No. KLE 0059

Sheet No. C24.0

X:\PROJECTS\0059 – USD MASTER PLAN (MWSG)\ENGR\EXHIBITS\CUP PLANS\DRAWINGS\0059 USD CUP PLANS.DWG (08–11–16 1:44:07PM) Plotted by: Mike



EASEMENT SUMMARY

— — ## SEE EASEMENT SUMMARY AND DESCRIPTION ON SHEETS C3.0 - C11.0.

WET UTILITIES

—S— S1 EXISTING SEWER MAIN (PRIVATE)

—W— W1 EXISTING WATER SERVICES (PRIVATE) (PORTIONS TO BE REMOVED/RELOCATED)

—W— W2 EXISTING 8" WATER MAIN (PUBLIC)

—W— W3 EXISTING WATER SERVICES

—F— F1 EXISTING FIRE HYDRANT (PRIVATE)

DRAINAGE

—SD— D1 EXISTING STORM DRAIN (PRIVATE) (PORTIONS TO BE REMOVED/RELOCATED)

—SD— D2 EXISTING STORM DRAIN (PRIVATE)

(→) DIRECTION OF EXISTING STORMWATER FLOW

STORM WATER

- PERVIOUS/IMPERVIOUS AREA

EXISTING: IMPERVIOUS AREA = 29,950 SF
PERVIOUS AREA = 11,700 SF

PROPOSED: IMPERVIOUS AREA = 28,900 SF
(BUILDING FOOTPRINT = 22,000 SF)
PERVIOUS AREA = 12,750 SF

DELTA: APPROXIMATE ANTICIPATED
IMPERVIOUS AREA DECREASE = 1,050 SF

CANDIDATE BIORETENTION BASIN AREAS (MIN. AREA ~ 6,100 SF)

- WATER QUALITY & HYDROMODIFICATION

(REFER TO SHEET C35.0 FOR PRELIMINARY CALCULATIONS)
(SEE "TECHNICAL STUDIES" NOTES ON SHEET C2.0)

KEY MAP

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UNIVERSITY OF SAN DIEGO MASTER PLAN UPDATE 5998 ALCALA PARK SAN DIEGO, CA PROJECT NO. SITE NO. 24

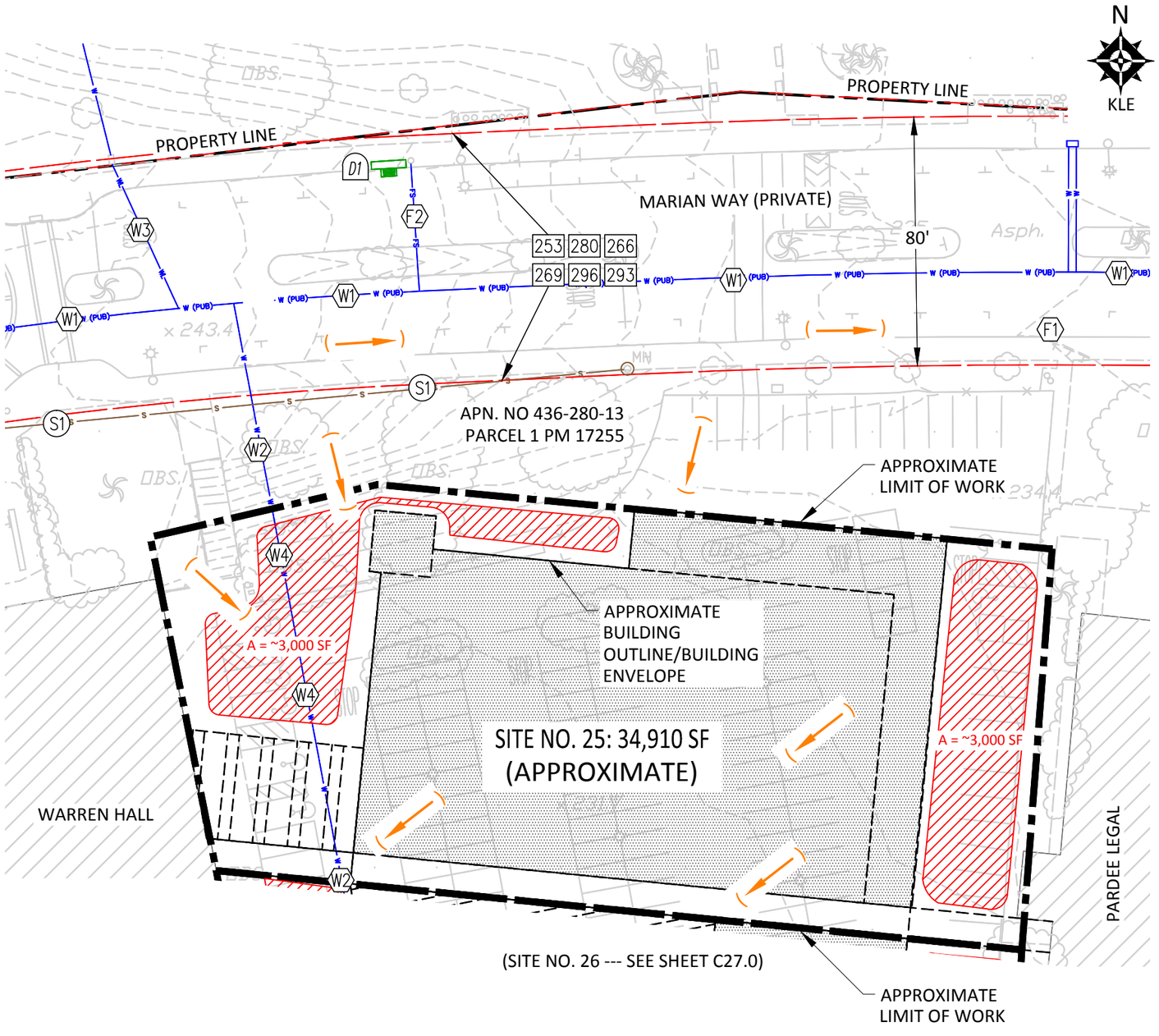
REVISIONS

1	06.30.15	MIR SUBMITTAL
2	10.30.15	1st CUP SUBMITTAL
3	03.07.16	2nd CUP SUBMITTAL
4	06.09.16	ADDED BIO-BASINS
5	08.22.16	3RD CITY SUBMITTAL

Job No. KLE 0059

Sheet No.

C25.0



0 40 80

DRAWING SCALE: 1"=40'

EASEMENT SUMMARY

— — ## SEE EASEMENT SUMMARY AND DESCRIPTION ON SHEETS C3.0 - C11.0.

WET UTILITIES

—S— S1 EXISTING SEWER MAIN (PRIVATE)

—W— W1 EXISTING 8" WATER MAIN (PUBLIC)

—W— W2 EXISTING WATER MAIN (PRIVATE)

—W— W4 EXISTING WATER MAIN (PRIVATE) -- TO BE REMOVED

—W— W3 EXISTING WATER SERVICES (PRIVATE)

—F— F1 EXISTING FIRE SERVICES (PRIVATE)

—F— F2 EXISTING FIRE SERVICE (PRIVATE)

DRAINAGE

—SD— D1 EXISTING INLET (PRIVATE)

(→) DIRECTION OF EXISTING STORMWATER FLOW

STORM WATER

- PERVIOUS/IMPERVIOUS AREA

EXISTING: IMPERVIOUS AREA = 31,060 SF
PERVIOUS AREA = 3,850 SF

PROPOSED: IMPERVIOUS AREA = 29,305 SF
(BUILDING FOOTPRINT = 23,700 SF)
PERVIOUS AREA = 5,605 SF

DELTA: APPROXIMATE ANTICIPATED
IMPERVIOUS AREA DECREASE = 1,755 SF

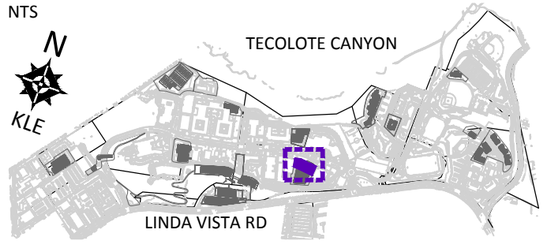
CANDIDATE BIORETENTION BASIN AREAS
(MIN. AREA ~ 6,000 SF)

- WATER QUALITY & HYDROMODIFICATION

(REFER TO SHEET C35.0 FOR PRELIMINARY CALCULATIONS)
(SEE "TECHNICAL STUDIES" NOTES ON SHEET C2.0)

KEY MAP

NTS



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PROJECT NO. SITE NO. 25

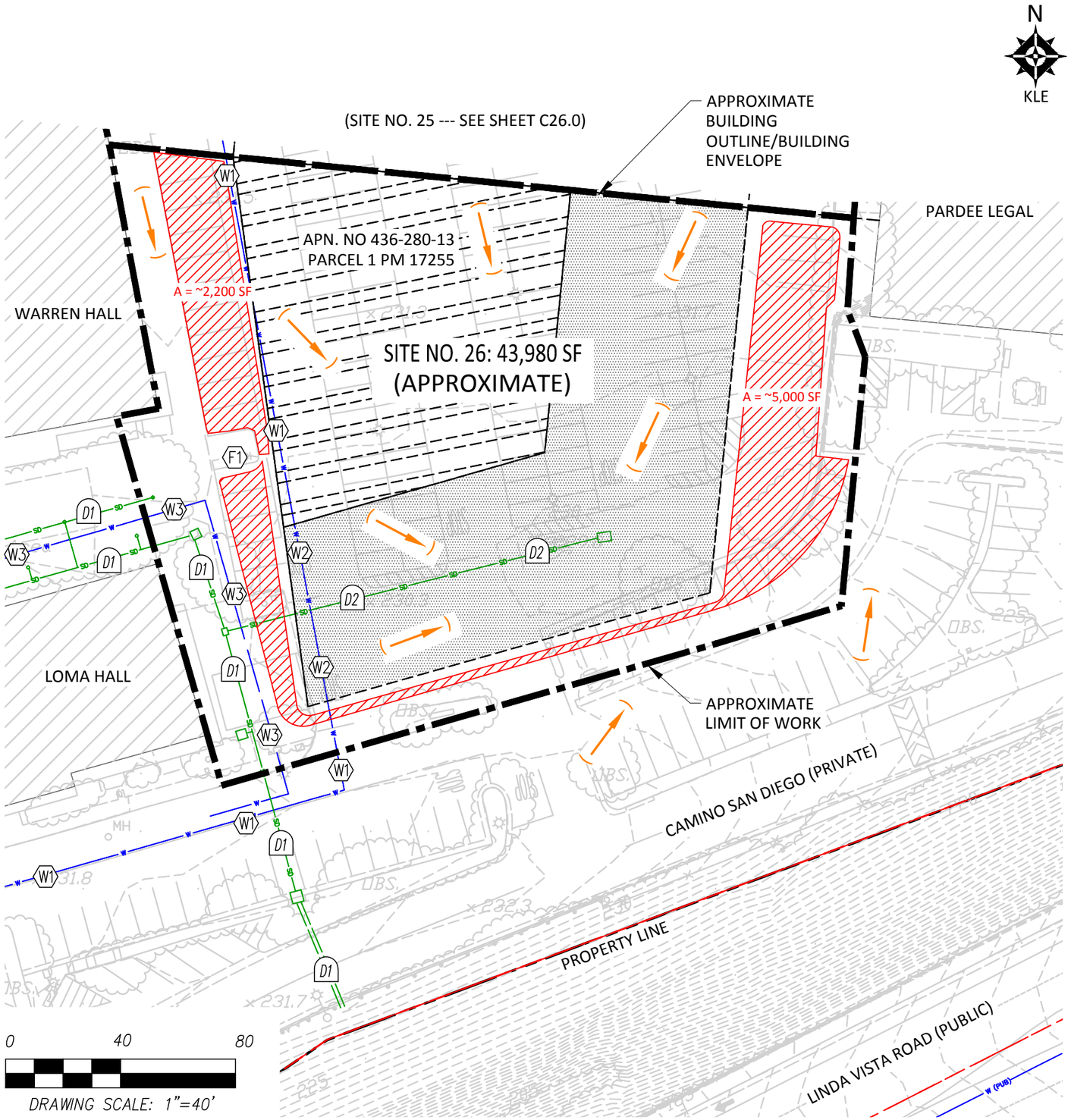
REVISIONS

1	06.30.15	MIR SUBMITTAL
2	10.30.15	1st CUP SUBMITTAL
3	03.07.16	2nd CUP SUBMITTAL
4	06.09.16	ADDED BIO-BASINS
5	08.22.16	3RD CITY SUBMITTAL

Job No. KLE 0059

Sheet No.

C26.0



EASEMENT SUMMARY

— — ## SEE EASEMENT SUMMARY AND DESCRIPTION ON SHEETS C3.0 - C11.0.

WET UTILITIES

—S— S1 N/A

—W— W1 EXISTING WATER MAIN (PRIVATE)

—W— W2 EXISTING WATER MAIN (PRIVATE)
(PORTION TO BE REMOVED/RELOCATED)

—W— W3 EXISTING WATER SERVICE (PRIVATE)

—F— F1 EXISTING FIRE SERVICE

DRAINAGE

—SD— D1 EXISTING STORM DRAIN (PRIVATE)

—SD— D2 EXISTING STORM DRAIN (PRIVATE)
(PORTION TO BE REMOVED/RELOCATED)

(——→) DIRECTION OF EXISTING STORMWATER FLOW

STORM WATER

- PERVIOUS/IMPERVIOUS AREA

EXISTING: IMPERVIOUS AREA = 42,280 SF
PERVIOUS AREA = 1,700 SF

PROPOSED: IMPERVIOUS AREA = 34,990 SF
(BUILDING FOOTPRINT = 26,000 SF)
PERVIOUS AREA = 8,990 SF

DELTA: APPROXIMATE ANTICIPATED
IMPERVIOUS AREA DECREASE = 7,290 SF

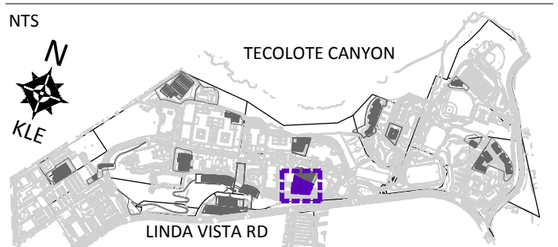
CANDIDATE BIORETENTION BASIN AREAS
(MIN. AREA ~ 7,200 SF)

- WATER QUALITY & HYDROMODIFICATION

(REFER TO SHEET C36.0 FOR PRELIMINARY CALCULATIONS)
(SEE "TECHNICAL STUDIES" NOTES ON SHEET C2.0)

KEY MAP

NTS



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MASTER PLAN UPDATE
5998 ALCALA PARK SAN DIEGO, CA
PROJECT NO. SITE NO. 26

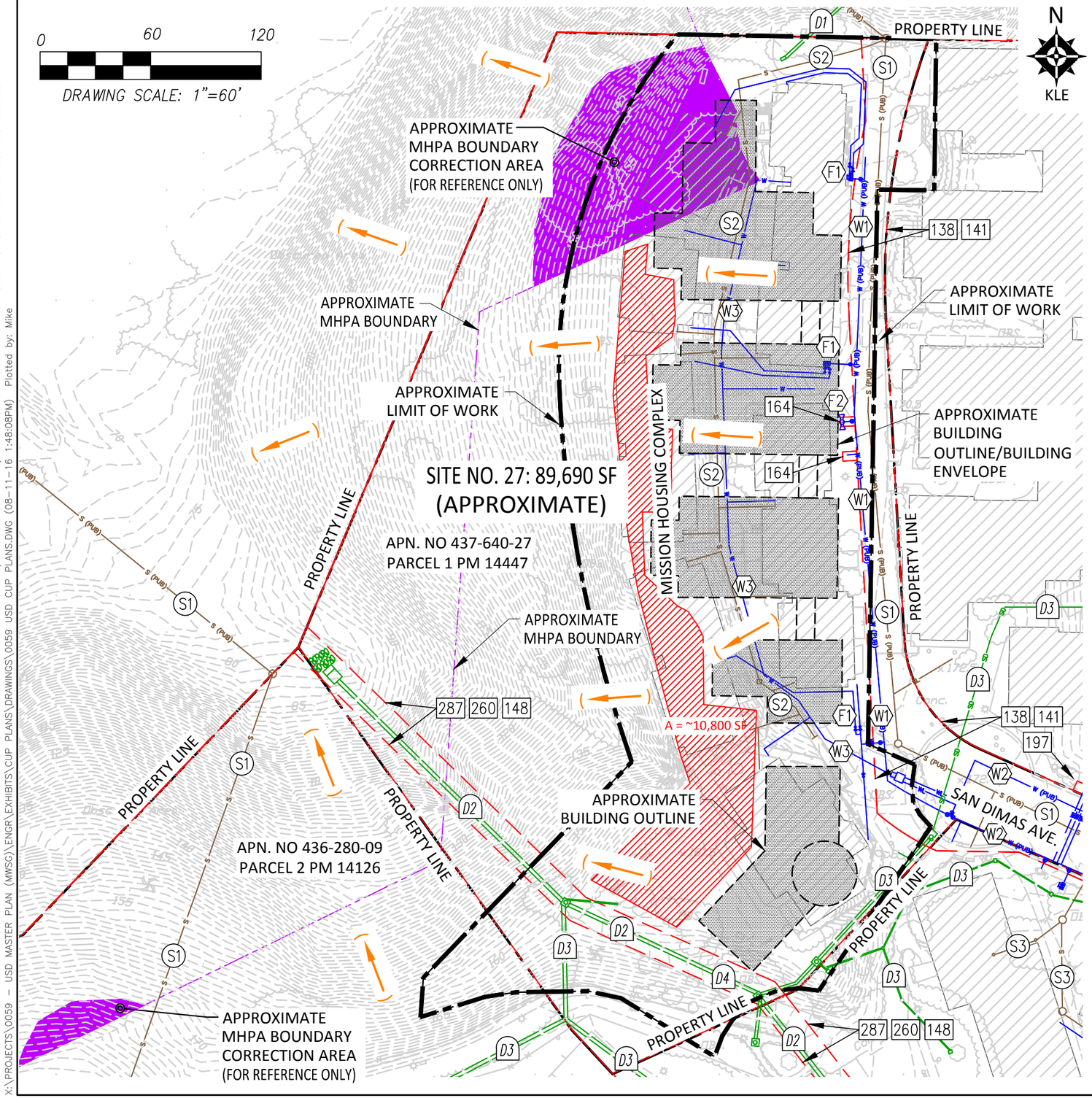
REVISIONS

1	06.30.15	MIR SUBMITTAL
2	10.30.15	1st CUP SUBMITTAL
3	03.07.16	2nd CUP SUBMITTAL
4	06.09.16	ADDED BIO-BASINS
5	08.22.16	3RD CITY SUBMITTAL

Job No. KLE 0059

Sheet No.
C27.0

X:\PROJECTS\0059 – USD MASTER PLAN (MMSG)\ENGR\EXHIBITS\CUP PLANS\DRAWINGS\0059 USD CUP PLANS.DWG (08-11-16 1:48:08PM) Plotted by: Mike



EASEMENT SUMMARY

— — ## SEE EASEMENT SUMMARY AND DESCRIPTION ON SHEETS C3.0 - C11.0.

WET UTILITIES

- S1 EXISTING 8" SEWER MAIN (PUBLIC)
- S2 EXISTING SEWER MAIN (PRIVATE) (PORTIONS TO BE REMOVED/RELOCATED)
- S3 EXISTING 8" SEWER MAIN (PRIVATE)
- W1 EXISTING 10" WATER MAIN (PUBLIC)
- W2 EXISTING 12" WATER MAIN (PUBLIC)
- W3 EXISTING WATER SERVICES (PRIVATE) (PORTIONS TO BE REMOVED/RELOCATED)
- F1 EXISTING FIRE SERVICES (PRIVATE)
- F2 EXISTING FIRE HYDRANT (PUBLIC)

DRAINAGE

- D1 EXISTING 18" STORM DRAIN (PUBLIC)
- D2 EXISTING 24" STORM DRAIN (PUBLIC)
- D3 EXISTING STORM DRAIN (SIZE VARIES) (PRIVATE)
- D4 EXISTING 24" STORM DRAIN (PUBLIC) (PORTIONS TO BE REMOVED/RELOCATED)
- DIRECTION OF EXISTING STORMWATER FLOW

STORM WATER

- PERVIOUS/IMPERVIOUS AREA

EXISTING: IMPERVIOUS AREA = 46,720 SF
PERVIOUS AREA = 42,970 SF

PROPOSED: IMPERVIOUS AREA = 49,962 SF
(BUILDING FOOTPRINT = 28,570 SF)
PERVIOUS AREA = 39,728 SF

DELTA: APPROXIMATE ANTICIPATED
IMPERVIOUS AREA INCREASE = 3,242 SF

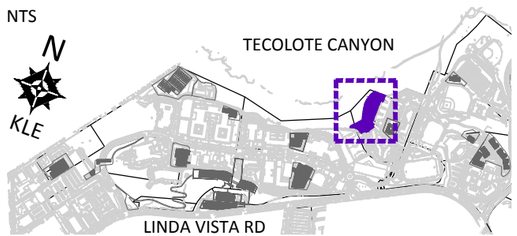
CANDIDATE BIORETENTION BASIN AREAS (MIN. AREA ~ 10,800 SF)

- WATER QUALITY & HYDROMODIFICATION

(REFER TO SHEET C36.0 FOR PRELIMINARY CALCULATIONS)
(SEE "TECHNICAL STUDIES" NOTES ON SHEET C2.0)

KEY MAP

NTS



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REVISIONS

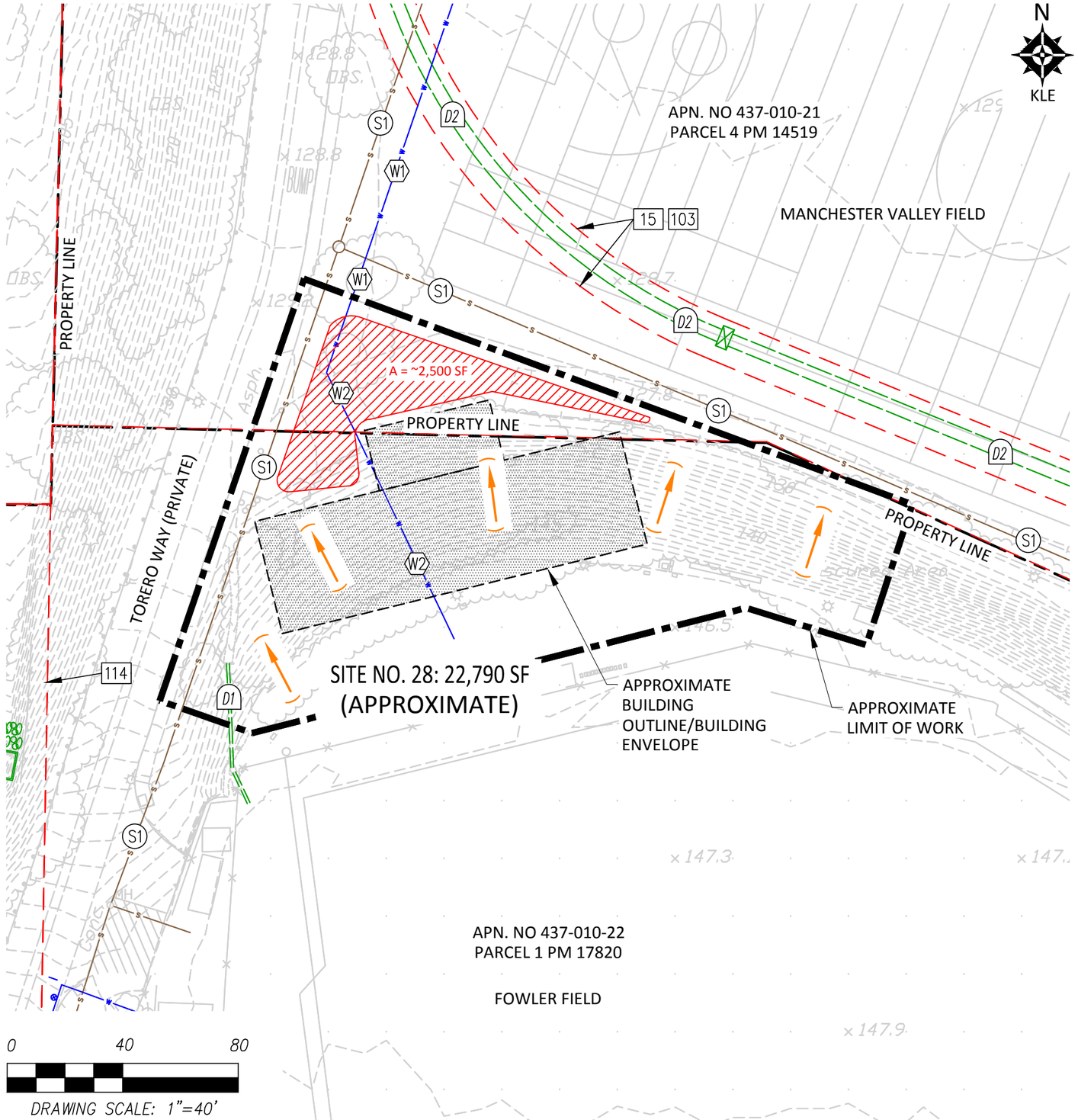
1	06.30.15	MIR SUBMITTAL
2	10.30.15	1st CUP SUBMITTAL
3	03.07.16	2nd CUP SUBMITTAL
4	06.09.16	ADDED BIO-BASINS
5	08.22.16	3RD CITY SUBMITTAL

Job No. KLE 0059

Sheet No.

C28.0

X:\PROJECTS\0059 - USD MASTER PLAN (MWSG)\ENGR\EXHIBITS\CUP PLANS\DRAWINGS\0059 USD CUP PLANS.DWG (08-11-16 1:49:27PM) Plotted by: Mike



EASEMENT SUMMARY

- ## — SEE EASEMENT SUMMARY AND DESCRIPTION ON SHEETS C3.0 - C11.0.

WET UTILITIES

- S1 — EXISTING 8" SEWER MAIN (PRIVATE)
- W1 — EXISTING WATER SERVICE (PRIVATE)
- W2 — EXISTING WATER SERVICES (PRIVATE) (PORTIONS TO BE REMOVED/RELOCATED)

DRAINAGE

- D1 — EXISTING STORM DRAIN (PRIVATE)
- D2 — EXISTING 54" STORM DRAIN (PUBLIC)
- DIRECTION OF EXISTING STORMWATER FLOW

STORM WATER

- PERVIOUS/IMPERVIOUS AREA

EXISTING: IMPERVIOUS AREA = 2,490 SF
PERVIOUS AREA = 20,300 SF
PROPOSED: IMPERVIOUS AREA = 10,348 SF
(BUILDING FOOTPRINT = 6,200 SF)
PERVIOUS AREA = 12,443 SF
DELTA: APPROXIMATE ANTICIPATED
IMPERVIOUS AREA INCREASE = 7,858 SF

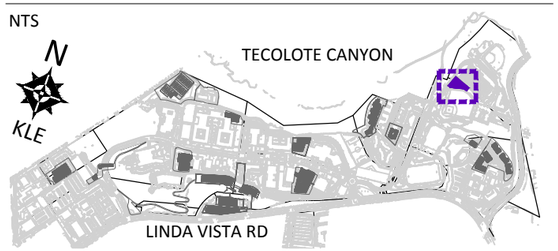
CANDIDATE BIORETENTION BASIN AREAS (MIN. AREA ~ 2,500 SF)

- WATER QUALITY & HYDROMODIFICATION

(REFER TO SHEET C36.0 FOR PRELIMINARY CALCULATIONS)
(SEE "TECHNICAL STUDIES" NOTES ON SHEET C2.0)

KEY MAP

NTS



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PROJECT NO. SITE NO. 28

REVISIONS

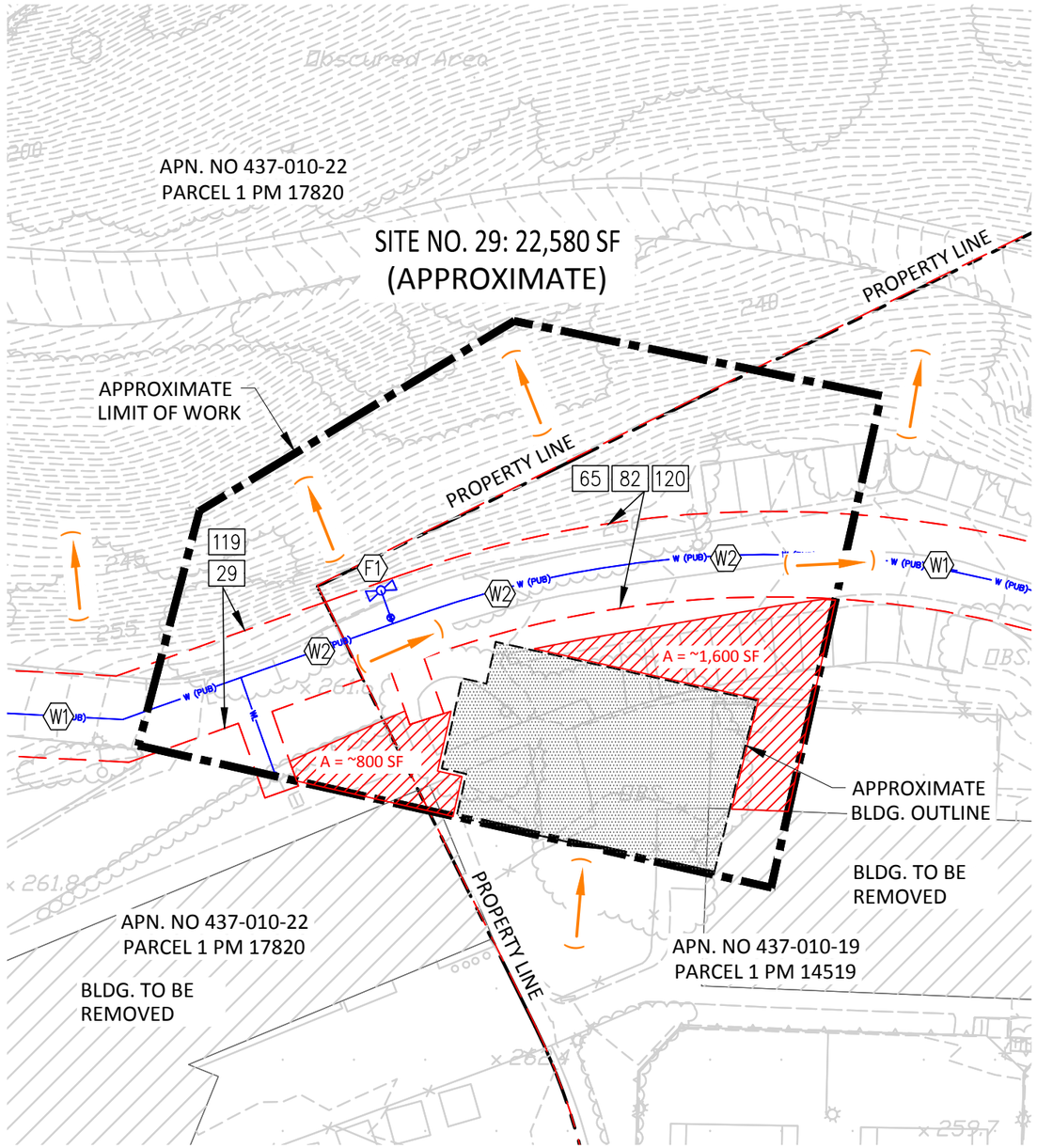
1	06.30.15	MIR SUBMITTAL
2	10.30.15	1st CUP SUBMITTAL
3	03.07.16	2nd CUP SUBMITTAL
4	06.09.16	ADDED BIO-BASINS
5	08.22.16	3RD CITY SUBMITTAL

Job No. KLE 0059

Sheet No.

C29.0

X:\PROJECTS\0059 - USD MASTER PLAN (MWSO)\ENGR\EXHIBITS\CUP PLANS\DRAWINGS\0059 USD CUP PLANS.DWG (08-11-16 1:51:05PM) Plotted by: Mike



0 40 80

DRAWING SCALE: 1"=40'

N

KLE

EASEMENT SUMMARY

— — ## SEE EASEMENT SUMMARY AND DESCRIPTION ON SHEETS C3.0 - C11.0.

WET UTILITIES

—S— S1 N/A

—W— W1 EXISTING 12" WATER MAIN (PUBLIC)

—W— W2 EXISTING 12" WATER MAIN (PUBLIC)
(PORTIONS TO BE REMOVED/RELOCATED)

—F— F1 EXISTING FIRE HYDRANT (PUBLIC)
(PORTIONS TO BE REMOVED/RELOCATED)

DRAINAGE

—SD— D1 N/A

(→) DIRECTION OF EXISTING STORMWATER FLOW

STORM WATER

- PERVIOUS/IMPERVIOUS AREA

EXISTING: IMPERVIOUS AREA = 8,126 SF
PERVIOUS AREA = 14,454 SF

PROPOSED: IMPERVIOUS AREA = 9,770 SF
(BUILDING FOOTPRINT = 4,280 SF)
PERVIOUS AREA = 12,810 SF

DELTA: APPROXIMATE ANTICIPATED
IMPERVIOUS AREA INCREASE = 1,644

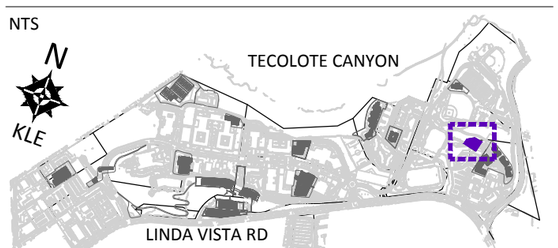
CANDIDATE BIORETENTION BASIN AREAS
(MIN. AREA ~ 2,400 SF)

- WATER QUALITY & HYDROMODIFICATION

(REFER TO SHEET C36.0 FOR PRELIMINARY CALCULATIONS)
(SEE "TECHNICAL STUDIES" NOTES ON SHEET C2.0)

KEY MAP

NTS



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PROJECT NO. SITE NO. 29

REVISIONS

1	06.30.15	MIR SUBMITTAL
2	10.30.15	1st CUP SUBMITTAL
3	03.07.16	2nd CUP SUBMITTAL
4	06.09.16	ADDED BIO-BASINS
5	08.22.16	3RD CITY SUBMITTAL

Job No. KLE 0059

Sheet No.

C30.0

APN. NO 437-010-22
PARCEL 1 PM 17820

N
KLE

PROPERTY LINE
PROPERTY LINE
APPROXIMATE BLDG. OUTLINE
APPROXIMATE LIMIT OF WORK
APPROXIMATE BLDG. OUTLINE
APPROXIMATE BLDG. OUTLINE
APPROXIMATE LIMIT OF WORK
(SITE NO. 29 --- SEE SHEET C30.0)
VIA LAS CUMBRES (PUBLIC)
SITE NO. 30 131,780 SF (APPROXIMATE)
ALCALA VISTA APARTMENTS
A = ~3,700 SF
A = ~4,000 SF
A = ~1,300 SF
A = ~3,000 SF
A = ~2,000 SF
A = ~3,000 SF
A = ~4,000 SF
82
120
65
127
111
127
111
105
APN. NO 437-010-19
PARCEL 1 PM 14519

0 80 160
DRAWING SCALE: 1"=80'

EASEMENT SUMMARY

— — ## SEE EASEMENT SUMMARY AND DESCRIPTION ON SHEETS C3.0 - C11.0.

WET UTILITIES

—S— S1 EXISTING 8" SEWER MAIN (PUBLIC)
—S— S2 EXISTING 8" SEWER MAIN (PRIVATE)
—W— W1 EXISTING 8" WATER MAIN (PUBLIC)
—W— W2 EXISTING 12" WATER MAIN (PUBLIC)
—W— W3 EXISTING 12" WATER MAIN (PUBLIC) (PORTIONS TO BE REMOVED/RELOCATED)
—W— W4 EXISTING 10" WATER MAIN (PUBLIC)
—F— F1 EXISTING FIRE HYDRANT (PUBLIC)
—F— F2 EXISTING FIRE SERVICES (PRIVATE)

DRAINAGE

—SD— D1 EXISTING 24" STORM DRAIN (PUBLIC)
—SD— D2 EXISTING 18" STORM DRAIN (PUBLIC)
—SD— D3 EXISTING STORM DRAIN (SIZE VARIES) (PRIVATE)
(→) DIRECTION OF EXISTING STORMWATER FLOW

STORM WATER

- PERVIOUS/IMPERVIOUS AREA

EXISTING: IMPERVIOUS AREA = 80,975 SF
PERVIOUS AREA = 50,805 SF
PROPOSED: IMPERVIOUS AREA = 96,780 SF
(BUILDING FOOTPRINT = 36,500 SF)
PERVIOUS AREA = 35,000 SF
DELTA: APPROXIMATE ANTICIPATED
IMPERVIOUS AREA INCREASE = 15,805 SF

CANDIDATE BIORETENTION BASIN AREAS (MIN. AREA ~ 21,000 SF)

- WATER QUALITY & HYDROMODIFICATION

(REFER TO SHEET C37.0 FOR PRELIMINARY CALCULATIONS)
(SEE "TECHNICAL STUDIES" NOTES ON SHEET C2.0)

OFFSITE IMPROVEMENTS

REFER TO SHEET C1.1 FOR OFFSITE IMPROVEMENTS REQUIRED FOR PROJECT NO. 30.

KEY MAP

NTS
N
KLE
TECOLOTE CANYON
LINDA VISTA RD

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PROJECT NO. SITE NO. 30

REVISIONS

1	06.30.15	MIR SUBMITTAL
2	10.30.15	1st CUP SUBMITTAL
3	03.07.16	2nd CUP SUBMITTAL
4	06.09.16	ADDED BIO-BASINS
5	08.22.16	3RD CITY SUBMITTAL

Job No. KLE 0059

Sheet No.
C31.0