Biological Technical Report Addendum

Maple Canyon—Restoration Phase 1 (H176828)
Site Development Permit

San Diego, California

Development Services Department
Project Number 517439

Prepared for

City of San Diego
Department of Public Works

Prepared on Behalf of:

Rick Engineering Company
5620 Friars Road
San Diego, CA 92110
(619) 291 0707

Prepared By:

Tierra Data Inc.
10110 W. Lilac Road
Escondido, CA 92026
(760) 749-2247

March 2020

Principal Investigator:

Derek H. Langsford, PhD, CSE
Biology Practice Manager

This page intentionally left blank

Table of Contents

List of Figures

List of Tables

Summary

The proposed Project would repair and replace 16 existing storm drain (SD) systems in and around Maple Canyon, and add an additional SD System along West Maple Street (for a total of 17 SD Systems) to allevaite storm water erosion in the canyon and street flooding in the Banker's Hill Community.

A total of 5.86 acres of impacts by the proposed Project would occur. Only 0.10 acre of these impacts are permanent and 4.44 acres of the 5.86 acres are impacts to Tier IV Eucalyptus Woodland, Ornamental plants, Developed, or Disturbed areas such as roads above the canyon or the unpaved Maple Canyon trail. Mitigation for all imapcts will be required at a 1:1 ratio for impacts to 0.09 acre of Tier II Diegan Coastal Sage Scrub (DCSS) and at a 0:5:1 ratio for impacts to 1.33 acres of Tier IIIB Non-native Grassland. A total of 0.76 acre of mitatigion is requried, primarily for non-native grassland, and would be provided by payment into the City's Habitat Acquisition Fund (HAF).

A total of 0.361 acre of jurisdictional waters of the U.S. (WoUS), 0.615 acre of state jurisdiction, but no City wetlands were identified in Maple Canyon by Tierra Data, Inc. (TDI). There was no area considered a wetland based on the U.S. Army Corps of Engineers (USACE) three-parameter definition within the study area or California Department of Fish and Wildlife (CDFW) riparian vegetation. Of the 0.615 acre identified, 0.361 acre is under USACE, Regional Water Quality Control Board (RWQCB), and CDFW jurisdiction, while the remaining 0.254 acre is exclusively under the jurisdiction of CDFW.

No jurisdictional areas will be permanently impacted by the proposed project. A total of 0.036 acre of jurisdictional WoUS and 0.061 acre of state jurisdiction (0.025 acre exclusively CDFW jurisdiction) would be temporarily impacted through gaining access to and construction of the Project. The City will need to obtain approvals from USACE, RWQCB, and CDFW prior to project implementation and to mitigate according to those approvals.

Introduction

TDI is pleased to present this Biological Technical Report (BTR) Addendum (Addendum) to the City of San Diego (City) to update the previously published BTR for the Maple Canyon Storm Drain Project (herein referred to as Maple Canyon Restoration Phase 1 Project or Project) prepared in May 2015 and revised in September 2016 and March 2018 by AECOM (AECOM 2018). Specifically, this Addendum provides updated information on the extent and type of biological resources in Maple Canyon and updates the project impacts to these features. The update was initiated because a preliminary field assessment by TDI in late 2018 revealed significant discrepancies between what had been previously reported to be jurisdictional WoUS and state jurisdictional waters and what was present.

This addendum provides a summary of the methods and results of this update within the proposed Project area by TDI. It also provides an updated impact assessment based on recent design changes.

Project Description

The Maple Canyon Restoration Phase 1 Project is proposed to replace and extend 16 existing SDs that are either failing or prone to failure and add a new SD (for a total of 17 new SD Systems) in the Bankers Hill neighborhood of the City of San Diego, California (Figure 1 and Figure 2). This entails replacement of street curb intakes, pipes, outfalls, and dissipaters that will take storm water from the City streets above the canyon, direct it down canyon slopes, and release it into the canyon bottom to enter the creek that flows through the canyon to West Maple Street at the canyon's western end. Storm water exiting the canyon will be captured by a new SD pipe to be constructed along West Maple Street that will connect to the City SD system that carries stormwater to San Diego Bay.

This Addendum has been prepared to accurately identify impacts from the proposed construction that will require vehicular access to the alignments and work areas within the canyon for excavators, backhoes, bobcats, dump trucks, concrete trucks, and support vehicles. Access to the improvements at the street levels and between residences will be from the streets above the canyon. Access to the SD alignments will occur mostly via expansion of the existing unpaved trail, but crossing the creek is required to access work areas on both sides of the canyon. Access to 12 of the 16 SD Systems within the canyon will be from West Maple Street at the west end of the canyon using the trail that will be widened to 15 feet with additional grading to stabilized slopes. Access points off Third and Fourth Avenues will be used for the three northern-most SDs (SD Systems 5, 6, and 7) within the canyon. Work on SD System 13 will be from First Avenue. Work on SD System 17 within West Maple Street will be from said street. Work within the canyon will entail establishing the access to the work areas, excavation of trenches for placement of the drainpipes, and grading for placement of the outfall structures and riprap energy dissipaters.

The proposed Project has avoided and minimized impacts to WoUS and state jurisdiction through using the existing access trail for access as much as possible, accessing work areas on the opposite side of the main access directly across the Drainage 1, and placing dissipaters and riprap just outside of jurisdictional areas.

After SD replacement and construction is complete, all areas disturbed by the SD replacement systems will be graded back to previous contours and, except where the trail will be reestablished, revegetated per project Landscape Construction Documents. This includes the small areas of native habitat being impacted and the non-native areas being removed/disturbed. Revegetation will not provide mitigation which will occur via payment into the HAF.

Methods

This addendum presents a summary of the methods and the results of the TDI review and analysis and an updated jurisdictional delineation.

All observed discrepancies were in the delineation of jurisdictional waters, whereas all uplands were judged to be accurate per the 2018 update of the AECOM BTR (AECOM 2018), other than the areas of jurisdictional wetland that became uplands per TDI's Jurisdictional Delineation (TDI 2019). To update the upland impact analysis TDI obtained AECOM's vegetation Geographic Information System (GIS) layer and applied the latest proposed Project design from Rick Engineering (Rick Engineering 2019) to obtain impact acreages.

The purpose of the updated delineation was to accurately determine the current extent of federal, state, and City jurisdiction within the proposed Project area potentially subject to regulation by the USACE under Section 404 of the Clean Water Act (CWA), RWQCB under Section 401 of the CWA and Porter Cologne Water Quality Control Act, CDFW under Section 1600 et seq. of the California Fish and Game Code, and the City under its Environmentally Sensitive Lands regulations.

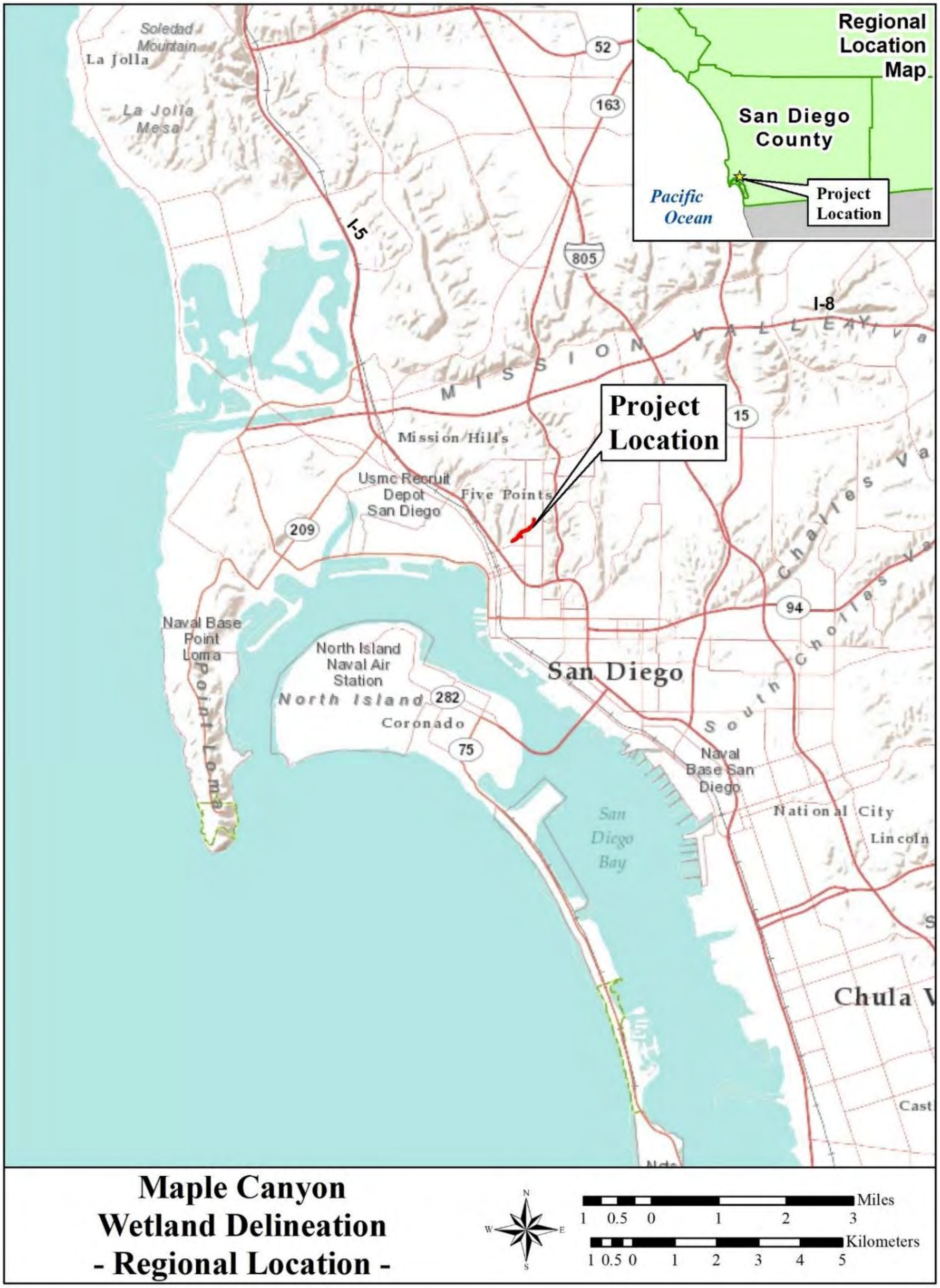


Figure 1. Proposed Project Location.

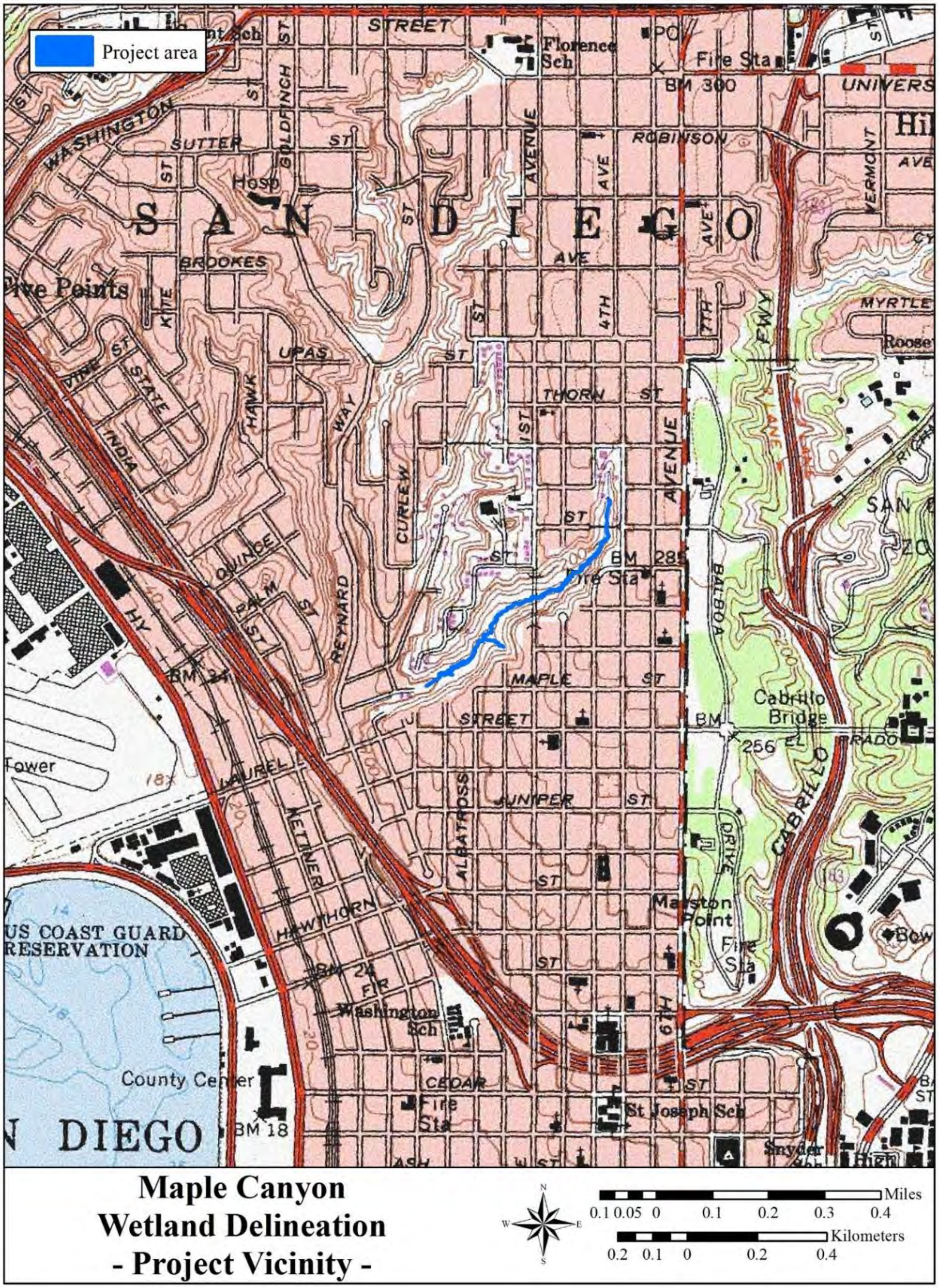


Figure 2. Proposed Project Vicinity.

Prior to conducting delineation fieldwork, the following literature and materials were reviewed:

1. Online aerial imagery and maps of the Project sites and 2-foot elevation contours to determine the potential locations of jurisdictional waters or wetlands;
2. U.S. Geological Survey topographic map to determine the presence of any "blue line" drainages or other mapped water features;
3. U.S. Department of Agriculture (USDA) soil mapping data (USDA 2018);
4. Hydric Soils List of California (USDA 2017);
5. U.S. Fish and Wildlife Service National Wetlands Inventory maps to identify areas mapped as wetland features (2018).

TDI biologists Derek Langsford and Joseph Kean performed exploratory wetland delineation surveys on 16 November 2018. TDI biologists Derek Langsford and Ben Van Allen performed focused wetland delineation surveys on 04 and 16 January 2019.

The delineation by TDI was requested by the City and followed work performed Merkel & Associates in 2012 and AECOM in 2013 with updates by AECOM in 2015, 2016, and 2018. Field data were collected using a Trimble GeoXH sub-inch accuracy handheld global positioning system (GPS) unit and a handheld field tape measure. All acquired field data were post-field processed.

TDI's initial November 2018 survey consisted of assessing the jurisdictional widths at the locations of five potential impact areas and walking up and down the main drainage and sub-drainages within the canyon assessing the canyon drainage and prior delineation work.

The 04 January visit included formal delineation of the canyon drainage using GPS and tape measure to map the main canyon and tributary drainage centerlines and measure widths. On 16 January, TDI visited areas previously identified as potential wetlands and dug soil pits. See the Jurisdictional Delineation (JD) report (Appendix B) for copies of wetland and ordinary high water mark (OHWM) datasheets.

USACE and RWQCB regulated WoUS, including wetlands, were delineated per the methods outlined in A Field Guide to the Identification of the Ordinary High Water Mark in the Arid West Region of the Western United States (USACE 2008a). The extent of WoUS was determined based on indicators of an OHWM. The OHWM width was measured at every change in width along the channel with distinctive profiles being recorded on OHWM Datasheets (USACE 2010).

Federally regulated wetlands were identified based on Wetlands Delineation Manual (USACE 1987) and Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region (USACE 2008b). Additional data was recorded to determine if an area satisfied the wetland criteria parameters (see wetland delineation forms in Appendix B). Three criteria must be satisfied to classify an area as a wetland under the jurisdiction of the USACE: 1) a predominance of hydrophytic vegetation; 2) the presence of hydric soils; and 3) the presence of wetland hydrology.

CDFW jurisdiction was delineated by observing and mapping the elevations of banks that confine a stream to a definite course when its waters rise to their highest level and to the extent of associated wetland/riparian vegetation (Brady and Vyverberg 2013). Because of the erosion of drainage banks, CDFW jurisdictional streambed was extended to the top of where soil had collapsed because of erosion at the base of the bank.

City wetlands were derived from the mapping of USACE and CDFW wetlands.

The full presentation of the delineation is in the JD Report for the project (TDI 2019) which is provided in Appendix B to this Addendum.

Results

Biological Resources

Descriptions of the biological resources present in Maple Canyon can be found in the AECOM BTR (AECOM 2018, Section 5.3 and Appendices A and B). As TDI surveyed Maple Canyon less than a year after AECOM's last survey, the TDI biologists only observed the vegetation communities and species identified by AECOM. The high level of disturbance in the canyon and it being surrounded by urban development means it was unlikely that any sensitive species would have come to the site. TDI biologists believe that AECOM's upland mapping and species lists were still applicable for the purposes of this project.

Uplands

Descriptions, maps and an acreage table of the different kinds of upland habitat types within the survey area and proposed project area can be found in the AECOM BTR (AECOM 2018, Section 5). The canyon mostly supports Eucalyptus Woodland, Non-native grassland, Ornamental, Disturbed, and Developed habitats. Small patches of Coastal Sage Scrub and some coast live oaks (*Quercus agrifolia*) also occur.

Wetlands

A total of 0.615 acre of unvegetated jurisdictional WoUS and State occurs within the survey area (Table 1, Appendix A: Figure 3a through 3c). There were no areas considered a wetland based on the USACE three-parameter definition within the study area with one soil pit being dug at the location which could potentially support wetland vegetation not meeting any of the required criteria. Of the 0.615 acre, 0.361 acre is USACE WoUS. and RWQCB jurisdiction, while the remaining 0.254 acre is exclusively under the jurisdiction of CDFW. No City wetlands are present in Maple Canyon as no USACE or CDFW wetlands are present and the City does not take jurisdiction over ephemeral drainages. A 2012 survey in Maple Canyon discovered standing water with some associated wetland vegetation behind and upstream of the detention basin dam erected at the end of the canyon (Merkel & Associates 2012); however, during AECOM's 2018 and TDI's 2019 survey, erosion and sedimentation, and variation in rainfall had likely prevented the formation of wetland soils and precluded the establishment of wetland plants as none were found. Table 1 presents the types of jurisdictional WoUS and CDFW jurisdiction that occur within the survey area, while Figures 3a through 3c in Appendix A depict the locations of all jurisdictional waters. A description of each drainage feature is provided below.

Table 1. Jurisdictional Areas.

Feature	Acreage (width in feet)			Linear Feet (delineated)
	USACE	CDFW	City	
Drainage 1	0.349 (1'-20')	0.597 (1'-32')	None	2,834
Drainage 2	0.009 (1'-2')	0.014 (2-3')	None	255
Drainage 3	0.003 (1'-4')	0.004 (2'-7')	None	50
Total	0.361	0.615	None	3,139

Drainage 1

Drainage 1 is the main channel through the canyon that starts north of the Quince Street (pedestrian) Bridge and ends at the filled detention basin near the eastern terminus of the western portion of West Maple Street at the western entrance to Maple Canyon.

Drainage 1 starts south of the head of the canyon, south of where a Brazilian pepper tree (*Schinus terebinthifolius*) has broken the outlet of a SD and has created an erosional hollow from which water exits chaotically and has tumbled debris down the bottom of the canyon. Downstream of this debris, the drainage settles into a narrow channel with identifiable features of jurisdiction that then continues downstream.

The channel varies in width and depth along the canyon floor passing among bluegum (*Eucalyptus globulus*) and Canary Island palm (*Phoenix canariensis*) trees and through non-native grasslands. Storms in 2018/2019 have damaged or toppled eucalyptus trees and their broken branches and fallen trunks are evident in several places along the creek affecting water flow. Severe erosion has occurred in places creating high, vertical banks and exposing utility pipes. Where the drainage approaches and crosses the trail, the compacted soil and potential trail maintenance has limited the erosion which considerably narrows the drainage until it reaches the softer erodible soil on the west side of the trail.

Downstream of the trail crossing the channel is relatively narrow as it passes into the flatter portion of the canyon bottom. Drainage 2 enters Drainage 1 from the south where the area has undergone changes in previous years with evidence of prior alternate beds especially where Drainage 2 enters Drainage 1. Downstream of this confluence, the area has undergone considerable erosion and has broadened and deepened the channel ultimately to its maximum width (32 feet) and depth (20 feet) in the canyon. The canyon walls are very fragile in this section and have collapsed in many locations creating large blow-outs in the canyon walls. After the erosive “canyon-like” section, flow becomes more controlled and the channel settles, becoming narrower and shallower, curving through the last section until it reaches the detention basin.

This detention basin was created in 2007/2008 by placing a curved rip-rap barrier at the end of the stream before it empties onto West Maple Street. A 2012 census conducted by Merkel and Associates discovered standing water and wetland facultative vegetation in the detention basin, but by 2016 AECOM biologists discovered upland plants dominating a dry basin. The present survey, conducted in 2018/2019 found that alluvium has filled the basin, with a channel cut through it that spills over and through the riprap, and causes erosion in the road beyond the basin. Upland plants continued to dominate the sandy soils of the basin.

Drainage 2

Drainage 2 is the tributary drainage that joins Drainage 1 approximately 700 feet southwest of First Avenue. The precise source of the water for this this feature is unknown but is most likely storm water drainage from streets or buildings above on 1st Avenue and/or Front Street. Drainage 2 flows down slope in a clearly identifiable channel on its final descent towards Drainage 1 before entering a pipe to pass under the trail before completing its journey to the main canyon Drainage 1.

Drainage 3

Drainage 3 is a short tributary to Drainage 1 and appears to have its origins as SD intake and runoff from roofs of buildings at the corner of West Maple Street and Albatross Street. A Corrugated Metal Pipe and flexible plastic pipes carry water to the top of a dissembling concrete v-ditch downstream which forms an erosional channel that plunges to the trail at the bottom of the slope. Water crosses the trail without causing severe erosion and only just after crossing the trail, does an organized channel with bed and bank begin to form. At this point the jurisdiction is considered to have begun. The channel continues a short distance to the north before entering Drainage 1.

Several existing SDs outlet into the canyon, with some creating erosional features that contribute to Drainage 1. These features do not have any characteristics of an OHWM and were determined not to be WoUS or CDFW jurisdictional.

All jurisdictional resources were ephemeral drainages. While a few hydrophytic plants were scattered along the course of the Drainage 1, no aquatic or hydrophytic vegetation community was identified pursuant to Cowardin et al. (1979), Holland (1986), or Oberbauer at al. (2008). The vegetation occurring within the survey area is typically associated with disturbed area in the semiarid region of southern California.

Hydric Soils

The two soils present in the project vicinity, terrace escarpments on the slopes and canyon floor, and urban land, on the developed mesas, are not identified as hydric (USDA 2017) and a soil pit dug in the filled detention basin at the southern end of Maple Canyon, identified as hydric in a previously identified wetland, showed no features identifying the soil as hydric in this evaluation (Appendix B).

Hydrology

All hydrologic features in Maple Canyon are confined to the Maple Canyon Creek channel. The detention basin does not hold water, is filled with sediment, and has a channel running though it that carries water to West Maple Street. The detention basin no longer has a high water table or is saturated, the characteristics that were indictors of hydrology in 2012 (Appendix B).

Impacts

Permanent direct impacts would consist of vegetation removal and grading for the placement of permanent structures (i.e. energy dissipaters and riprap).

Temporary direct impacts would be associated with access road installation to work locations and the area required for pipe removal/installation, headwalls, and dissipater construction. Vegetation is expected to be removed from these areas; therefore, revegetation is proposed.

Uplands

The proposed Project would impact a grand total of 5.86 acres of uplands, 4.44 of which are to Tier IV habitats including Eucalyptus Woodland, Ornamental, Disturbed Habitat, and Developed (Table 2, Figures 4a-4c). The proposed Project would impact 1.42 acres of Tier I-IIIB Habitats including permanent impacts to 0.03 acre and temporary impacts to 1.39 acres (Tiers I-IIIB; Table 2). A total of 0.09 acre of temporary impacts and no permanent impacts occur to DCSS (Tier II) but no Coast Live Oak Woodland (Tier I) will be impacted by the proposed Project. The majority of upland impacts to Vegetation Tiers I-IIIB (1.33 acres [0.03 permanent and 1.30 temporary]) are to Non-native Grassland (Tier IIIB) habitat.

Wetlands

Out of the 0.361 acre of WoUS and 0.615 acre of state jurisdiction, the Project would temporarily impact 0.036 and 0.061 acre respectively (Table 3, Appendix A: Figure 4a through 4c). The project has been designed to avoid permanent impacts to jurisdictional areas and none would occur.

The 0.361 acre of WoUS are USACE-jurisdictional because they have a direct hydrological connection with San Diego Bay and the Pacific Ocean, a traditional navigable water, approximately 0.6 mile to the southwest. This connection consists of water from the canyon running down West Maple Street to a SD inlet at West Maple Street and State Street. From there the SD pipe carries the water to San Diego Bay and outfalls west of Harbor Drive.

The area under the jurisdiction of CDFW consists of 0.615 acre that includes the 0.361 acre of jurisdictional WoUS. No riparian habitat was delineated as jurisdictional that would be exclusively under the purview of CDFW.

No City wetlands were identified and so none are being impacted.

Access routes account for 0.027 acre of the 0.036 acre of the impacts to WoUS and 0.045 acre of the 0.061 acre of the impacts to CDFW jurisdiction. Drainages 2 and 3 will be mostly impacted because of the need to construct the outfalls above them and access only being possible from below. Work on the outfalls near the jurisdictional areas at the base of the alignments results in some additional temporary impacts. Construction will temporarily impact 0.009 acre of WoUS and 0.016 acre of CDFW jurisdiction. A total of approximately 476 linear feet (LF) will be temporarily impacted, 161 LF from access, and 315 LF from construction (Table 3).

Table 2. Permanent and Temporary proposed Project impact totals for all upland habitats and other upland land cover types in acres. This table reflects the revised scope of the Project and updates and replaces Table 5 in the 2019 AECOM Maple Canyon BTR (AECOM 2018).

Vegetation Cover/Land Type	Upland Tier Value	Permanent	Temporary (access)	Temporary (construction)	Total
Uplands		**0.03**	**0.54**	**0.85**	**1.42**
Coast Live Oak Woodland	I	0	0	0	0
Diegan Coastal Sage Scrub	II	0	0.03	0.06	0.09
Non-native Grassland	IIIB	0.03	0.51	0.79	1.33
Other Cover Types		**0.07**	**1.00**	**3.37**	**4.44**
Eucalyptus Woodland	IV	0.06	0.34	1.50	1.90
Ornamental	IV	0.01	0.02	0.61	0.64
Disturbed Habitat	IV	0	0.47	0.06	0.53
Urban/Developed	IV	0	0.17	1.20	1.37
Grand Total		**0.10**	**1.54**	**4.22**	**5.86**

Table 3. Impacts to Jurisdictional Waters.

Impact Type	IMPACTS				
	USACE		CDFW		Linear Feet (LF)
	sq. ft.	acres	sq. ft.	acres	ft.
Permanent	0	0	0	0	0
Temporary, construction	378.3	0.009	708.4	0.016	315.2
Temporary, access	1194.5	0.027	1950.4	0.045	161.2
Total	**1572.8**	**0.036**	**2658.8**	**0.061**	**476.4**

Discussion

While access into and through the canyon is primarily from streets, the Maple Canyon access road, and trails, the SD alignments and outfalls are on or at the base of the canyon slopes and support habitats that cannot be avoided and require mitigation.

Permitting

U.S. Army Corps of Engineers

Nationwide Permit (NWP) 43 may be used for storm water management facilities. This NWP authorizes discharges of dredged or fill material into non-tidal waters of the United States for the construction of stormwater management facilities, including stormwater detention basins and retention basins and other stormwater management facilities; the construction of water control structures, outfall structures and emergency spillways; the construction of low impact development integrated management features such as bioretention facilities (e.g., rain gardens), vegetated filter strips, grassed swales, and infiltration trenches; and the construction of pollutant reduction green infrastructure features designed to reduce inputs of sediments, nutrients, and other pollutants into waters to meet reduction targets established under Total Daily Maximum Loads set under the CWA.

The discharge cannot cause the loss (permanent impact of great than ½ acre) of WoUS. The discharge must not cause the loss of more than 300 LF of stream bed, unless for intermittent and ephemeral stream beds the district engineer waives the 300-LF limit by making a written determination concluding that the discharge will result in no more than minimal adverse environmental effects. This NWP does not authorize discharges into non-tidal wetlands adjacent to tidal waters. The loss of stream bed plus any other losses of jurisdictional wetlands and waters caused by the NWP activity cannot exceed ½ acre. This NWP does not authorize discharges of dredged or fill material for the construction of new stormwater management facilities in perennial streams. The proposed project would likely qualify under NWP 43 but would need a waiver from the District Engineer (over 475 LF of temporary impact is predicted). A pre-construction notification to the District Engineer prior to commencing the activity would be required.

Regional Water Quality Control Board

The project area is within the jurisdiction of the San Diego RWQCB (Region 9). Under Section 401 of the CWA, the RWQCB must certify that the discharge of dredged or fill material into WoUS does not violate state water quality standards. The State Water Resources Control Board (SWRCB) has not generally certified NWP 43 (SWRCB 2017), so a Section 401 Certification from the San Diego RWQCB would be required.

California Department of Fish and Wildlife

A 1602 Lake and Streambed Alteration Agreement would be required to authorize the activities that would alter the portions of the creek under CDFW jurisdiction.

Revegetation

Upland Revegetation

The proposed Project would impact 0.09 acre of DCSS, a Tier II habitat and 1.33 acres of Non-native Grassland, a Tier IIB habitat. Those impacts would require mitigation per City Multiple Species Conservation Program mitigation ratios for impacts outside of the Multi-Habitat Planning Area (MHPA).

Temporary impacts to 3.95 acres of upland habitat (0.64 acre of Ornamental vegetation, 1.90 acres of Eucalyptus Woodland, 1.33 acres of Non-native Grassland, and 0.09 acre of DCSS) would be revegetated with native upland vegetation. An additional 0.53 acre of disturbed habitat is the Maple Canyon trail which will be restored as a trail. The impacted upland habitat would be restored with DCSS vegetation with the intent to meet the erosion control requirements in the City’s Landscape Standards. The revegetated habitat would provide a higher value habitat than the impacted habitat. Detailed Landscape Construction Documents for the revegetation of temporary impacts include a 25-month maintenance and monitoring plan, planting/restoration measures, and success criteria as required by the Landscape Standards.

Because of the predominance of eucalyptus trees on both sides of the canyon, project implementation may result in the removal of some of these trees. Restoration may require additional removal as the leaf litter and shading caused by adjacent eucalyptus would prevent establishment of DCSS in the revegetation areas on the canyon slopes. While the canyon itself has little natural habitat remaining, the project largely avoids the extant DCSS on the north side of the canyon. There is a significant difference in conditions based on the aspect of the canyon sides that is often seen in inner City canyons where south- and west-facing slopes receive more sun and are drier than north- and east-facing slopes. South- and west-facing slopes, receive more sunlight, dry out faster, and support a more typical DCSS that often includes more cactus species that over time can push the DCSS towards maritime succulent scrub. North- and east-facing slopes receive sun in the cooler part of the day and less sun overall, retain more soil moisture, and can support larger shrubs, including some associated with local chaparral, as well as oak trees. Suggested plant palettes to take advantage of these differences are provided below (Table 4 through Table 7).

Complicating the revegetation of the canyon is the presence of single, and multi-family residences at the tops of the scopes. City Brush Management Zones (BMZs) need to be maintained to protect buildings from fires; however, maintaining non-native invasive species in BMZs will make maintenance of the revegetation in the canyon more difficult. Areas within BMZs should only be treated with hydroseed containing herbaceous and subshrub species.

The main access along the canyon floor creates a 15-foot access path with narrow cut and fill slopes that need to be revegetated. The main access route shall be treated to provide an 8-foot wide trail, 2 feet of mulch on either side of the trail, and the remainder shall be revegetated using hydroseed. In addition, the strips of grading beyond the access route between SD outfall work areas will also be revegetated using hydroseed. The restoration ecologist assigned to the installation shall have the discretion to substitute or add container stock to the hydroseed on the strips outside the access route revegetation when outside BMZs.

Table 4. South/West Facing Slope DCSS Container Stock.

Scientific Name	Common Name	Plant Size	Spacing (feet)	Plants/ Acre
Artemisia californica	Coast sagebrush	1 gallon	10	70
Bahiopsis laciniata	San Diego sunflower	1 gallon	10	70
Cylindropuntia prolifera	Coast cholla (south and west facing slopes)	1 gallon	5	125
Encelia californica	Coast sunflower	1 gallon	10	70
Eriogonoum fasciculatum var. fasciculatum	Coast buckwheat	1 gallon	5	100
Malosma laurina	Laurel leaf sumac	1 gallon	20	25
Opuntia littoralis	Coast prickly-pear (south and west facing slopes)	1 gallon	5	125
Rhus integrifolia	Lemonade berry	1 gallon	20	25
Ribes speciosum	Fuchsia flowered gooseberry	1 gallon	15	25
Salvia mellifera	Black sage	1 gallon	10	70
Stipa lepida	Foothill needlegrass	liner	2	200
			Total	**905**

Table 5. South/West Facing Slope DCSS Plant Palette—Hydroseed Mix.

Scientific Name	Common Name	Purity/ Germination	% Live Seed	Pounds/ Acre
Acmispon glaber	Deer weed	95/80	85	1
Cryptantha muricata	Popcorn flower	15/50	10	3
Deinandra fasciculata	Fascicled tarweed	20/80	20	3
Eriogonum fascicularum var. fascicularum	Coast buckwheat	50/20	10	5
Eriophyllum confertiflorum	Golden yarrow	30/70	25	3
Stipa lepida	Foothill needlegrass	90/60	65	6
			Total	**21**

Table 6. North/East Facing Slope DCSS Plant Palette Container Stock.

Scientific Name	Common Name	Plant Size	Spacing (feet)	Plants/ Acre
Ceanothus verrucosus	Wart-stemmed ceanothus	1 gallon	6	70
Eriogonoum fasciculatum var. fasciculatum	Coast buckwheat	1 gallon	5	100
Heteromeles arbutifolia	Toyon	1 gallon	10	30
Malosma laurina	Laurel sumac	1 gallon	10	30
Quercus agrifolia	Coast live oak	1 gallon	50	5
Quercus dumosa	Nuttall's scrub oak	1 gallon	10	70
Rhus integrifolia	Lemonade berry	1 gallon	20	25
Ribes speciosum	Fuchsia flowered gooseberry	1 gallon	15	25
Salvia mellifera	Black sage	1 gallon	5	100
Stipa lepida	Foothill needlegrass	liner	2	200
			Total	**655**

Table 7. North/East Facing Slope CSS Plant Palette —Hydroseed Mix.

Scientific Name	Common Name	Purity/ Germination	% Live Seed	Pounds/ Acre
Acmispon glaber	Deer weed	95/80	76	2
Acimpson heermanii	Prostrate deerweed	90/20	18	2
Astragalus tricopodus	Ocean locoweed	95/60	57	1
Crypthantha muricata	Popcorn flower	15/50	7.5	0.5
Deinandra fasciculata	Fascicled tarweed	20/80	16	0.5
Lupinus bicolor	Miniature lupine	98/85	83.3	2
Trifolium gracilentum	Pin-point clover	98/85	83.3	1
			Total	**9**

Mitigation

Sensitive Vegetation Communities

The project would result in permanent and temporary impacts to sensitive vegetation communities. According to the City's Significance Threshold guidelines, permanent and temporary impacts of more than 0.1 acre to upland habitats (Tiers I–IIIB) are considered significant and require mitigation. Permanent and temporary impacts to upland habitats (Tiers I–IIIB) total 1.42 acres and therefore require mitigation (Table 8).

To compensate for the loss of 0.09 acre of DCSS (Tier II), located outside the MHPA, and the potential plant and wildlife habitat it provided, impacts would be mitigated through payment to the City's HAF, which preserves habitat within the MHPA. Payment will be provided for 0.09 acre to achieve the required 1:1 ratio.

To compensate for the loss of 1.33 acres of Non-native Grassland (Tier IIIB) located outside the MHPA, and the potential plant and wildlife habitat it provided, impacts would also be mitigated through payment to the City's HAF. Payment will be provided for 0.67 acre to achieve the required 0.5:1 ratio.

As there are impacts to only 1.42 acres of sensitive upland habitats planned for this project, and mitigation needs totaling 0.76 acre results from these impacts, completing mitigation for project impacts within Maple Canyon would restore only a very small fraction of habitat in the Canyon and would be isolated. The HAF is used for projects with small impacts and mitigation needs like these, when small acreages of isolated habitat are impacted and when mitigation is less than 5 acres.

Table 8. Mitigation for Impacts to Sensitive Vegetation Communities.

Vegetation Community	Tier	Impacts (acres)	Ratios	Mitigation Required	Proposed Mitigation
Uplands					
Diegan Coastal Sage Scrub	II	**0.09**	**1:1 (impact outside MHPA, mitigation inside MHPA)**	**0.09**	**0.09**
Nonnative Grassland	IIIB	**1.33**	**0.5:1 (impact outside MHPA, mitigation inside MHPA)**	**0.67**	**0.67**
Other Cover Types					
Eucalyptus Woodland	IV	**1.90**	**n/a**	**n/a**	**0.00**
Ornamental	IV	**0.64**	**n/a**	**n/a**	**0.00**
Disturbed Habitat	IV	**0.53**	**n/a**	**n/a**	**0.00**
Urban/Developed	IV	**1.37**	**n/a**	**n/a**	**0.00**
Total		**5.86**	**n/a**	**0.76**	**0.76**

Jurisdictional Areas

The impacts to jurisdictional areas will require mitigation so that a no-net-loss of wetland area and functions and values is achieved. The impacts are to an ephemeral drainage that will be undergoing significant restoration as part of other plans to stabilize banks, reduce erosion, and promote establishment native vegetation along the channels. Mitigation for state and federal jurisdictional waters would require at least 0.12 acres. Specific mitigation requirements will be negotiated with the appropriate Permitting Agencies.

If you have any questions about this memorandum or recommendations, please contact Derek Langsford at (760) 749-2247.

Qualifications and Certifications

The following individuals contributed to the fieldwork and/or preparation of this report.

Derek H. Langsford	Ph.D., Ecology, UC Davis/San Diego State University, 1996 B.Sc., (Hons.), Ecological Science, University of Edinburgh, 1985 ESA Certified Senior Ecologist, San Diego County Approved Biologist
Elizabeth M Kellogg	M.S. International Agricultural Development with specialization in Range Management. UC Davis, 1981 B.S, Agricultural Science and Management, UC Davis, 1978 Certified Wetland Delineation USACE 1987 Manual, Certified Wetland Delineation Refresher Course, Arid West Supplement 2011
Joseph Kean	B.S., Biology, CSU Chico 2008
Benjamin G. Van Allen	Ph.D., Ecology and evolutionary Biology, Rice University, 2014 M.S. Biology, Virginia Commonwealth University, 2009 B.S. Environmental Science, Otterbein University, 2006

References

AECOM. 2018. Biological Technical Report for the Maple Canyon Storm Drain Project. City of San Diego, California. Originally 2015 but Revised 2016 and 2018.

AECOM. 2016. Maple Canyon Storm Drain Repairs Project Jurisdictional Impact Assessment Memorandum.

Brady, Roland H. III, and Kris Vyverberg. 2013. Methods to Describe and Delineate Episodic Stream Processes on Arid Landscapes for Permitting Utility-Scale Solar Power Plants. California Energy Commission. Publication Number. CEC-500-2014-013.

Cowardin, L. M., V. Carter, F. C. Golet, and E. T. LaRoe. 1979. Classification of wetlands and deepwater habitats of the United States. U.S. Fish and Wildlife Service. FWS/OBS-79/31. Washington, DC.

Holland, Robert F. 1986. Preliminary Descriptions of the Terrestrial Natural Communities of California. State of California, The Resources Agency, Department of Fish and Game (October).

Merkel & Associates. 2012. Maple Canyon Storm Drain Repairs Project Jurisdiction Wetland Delineation Report. May

Oberbauer, Thomas, Meghan Kelly, and Jeremy Buegge. March 2008. Draft Vegetation Communities of San Diego County. Based on "Preliminary Descriptions of the Terrestrial Natural Communities of California", Robert F. Holland, Ph.D., October 1986.

Rick Engineering. 2019. 100% Plans Maple Canyon Restoration - Phase 1.

State Water Resources Control Board (SWRCB). 2017. Clean Water Act Section 401 General Water Quality Certification and Order. http://www.waterboards.ca.gov/water_issues/programs/cwa401/docs/generalorders/nwp_go.pdf. March 17.

Tierra Data, Inc. 2019. Maple Canyon - Restoration Phase 1 (H176828) Jurisdictional Delineation Report.

U.S. Army Corps of Engineers (USACE). 1987. Wetlands Delineation Manual, Technical Report Y-8. U.S. Army Engineer Waterways Experiment Station, Vicksburg, Mississippi. 100 pp. + Appendices.

U.S. Army Corps of Engineers (USACE). 2008a. A Field Guide to the Identification of the Ordinary High Water Mark (OHWM) in the Arid West Region of the Western United States. A Delineation Manual. Lichvar and McColley. August.

U.S. Army Corps of Engineers (USACE). 2008b. Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region. September.

U.S. Army Corps of Engineers (USACE). 2010. Updated Datasheet for the Identification the Ordinary High Water Mark in the Arid West Region of the United States.

U.S. Department of Agriculture (USDA). 2017. List of Hydric Soils. Available Online: https://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/use/hydric/

U.S. Department of Agriculture (USDA). 2018. https://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx. Accessed March 2019.

U.S. Fish and Wildlife Service. 2018. National Wetlands Inventory. https://fwsprimary.wim.usgs.gov/wetlands/apps/wetlands-mapper/ accessed March 2019

This page intentionally left blank

Appendix A: Jurisdictional Area and Impact Figures

This page intentionally left blank

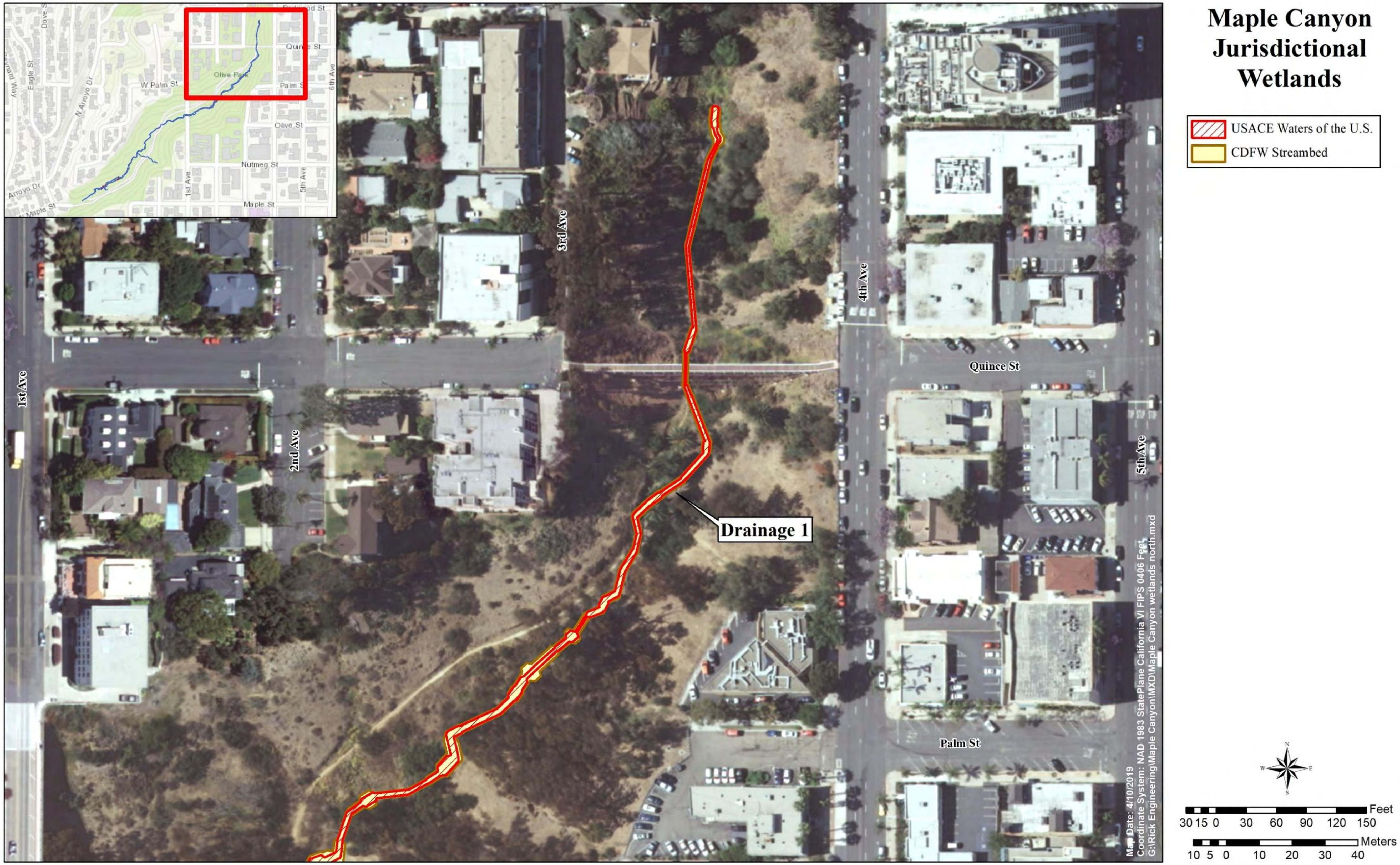


Figure 3a. Maple Canyon North - Jurisdictional Areas.

Figure 3b. Maple Canyon Central - Jurisdictional Areas.

Figure 3c. Maple Canyon South - Jurisdictional Areas.

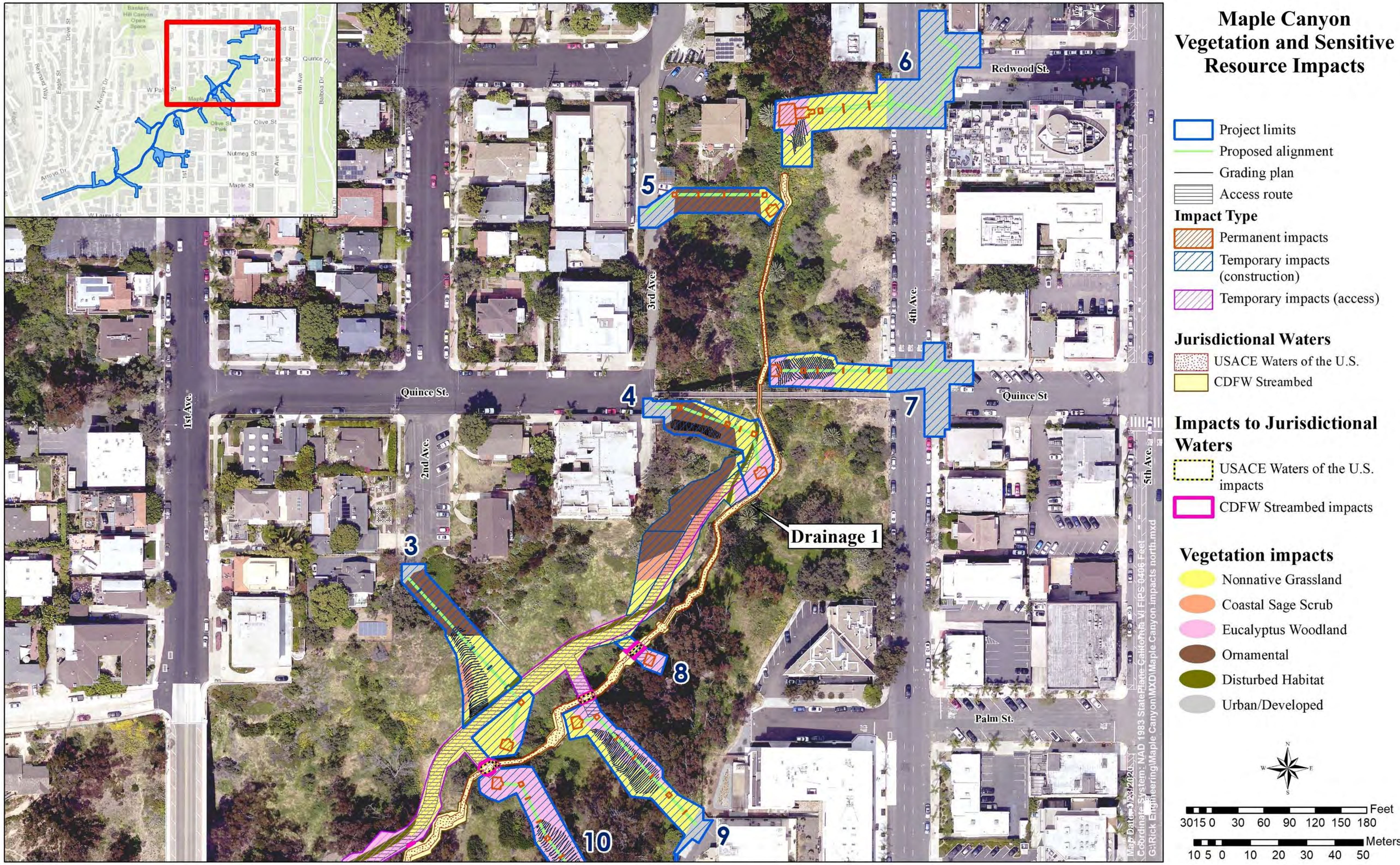


Figure 4a. Maple Canyon North – Upland and Jurisdictional Area Impacts.

Figure 4b. Maple Canyon Central - Upland and Jurisdictional Area Impacts.

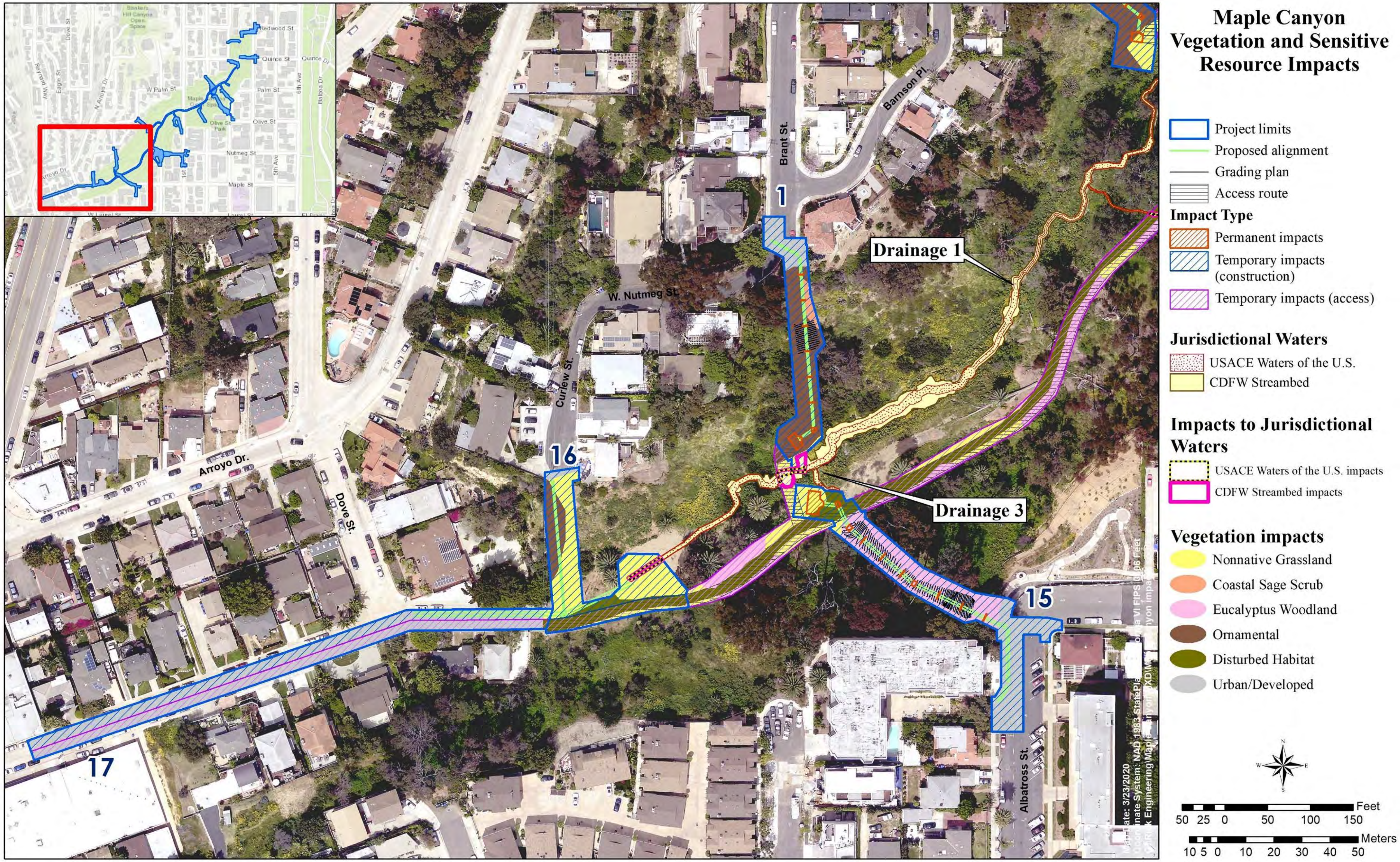


Figure 4c. Maple Canyon South - Upland and Jurisdictional Area Impacts.

Appendix B: Jurisdictional Delineation Report

This page intentionally left blank

City of San Diego
Maple Canyon—Restoration Phase 1
(H176828)

Jurisdictional Delineation Report

June 10, 2019

Prepared For:

Rick Engineering Company
5620 Friars Road
San Diego, CA 92110

Prepared By:

Tierra Data Inc.
10110 W. Lilac Road
Escondido, CA 92026

This Page Intentionally Blank

EXECUTIVE SUMMARY

Introduction

At the request of Rick Engineering Company, Tierra Data Inc. has prepared this delineation of City of Diego (City), state, and federal jurisdictional waters for the Maple Canyon–Restoration Phase 1 Project (Project), located in the Banker's Hill community of the City, San Diego County, California. The delineation in this report was performed to support the replacement 14 storm drain inlets, pipes, and outfalls that have failed or are in danger of failing, as well as the construction of new energy dissipators and placement of rip rap within and around the creek in Maple Canyon.

Methods

The field work for this delineation was conducted on November 16, 2018, and January 4 and 16, 2019. This delineation report documents the areas over which regulatory authority is granted to the U.S. Army Corps of Engineers (USACE), San Diego Regional Water Quality Control Board (RWQCB), California Department of Fish and Wildlife (CDFW), and City pursuant to the federal Clean Water Act (CWA), the California CWA and Porter-Cologne Water Quality Control Act, California Fish and Game Code, and the City's Environmentally Sensitive Lands regulations, respectively.

Results

The drainage feature draining Maple Canyon and all channels flowing into it were observed during the surveys, as were previously identified potential wetlands. Placement of fill and/or alteration within the identified jurisdictional areas is subject to USACE, RWQCB, and CDFW jurisdiction and approval. No City jurisdictional wetlands occur in Maple Canyon. Table ES1 identifies the total jurisdictional areas that are present for each agency.

Table 1. Summary of Jurisdictional Areas.

Jurisdictional Feature	USACE (acres)	RWQCB (acres)	CDFW (acres)	City (acres)
Waters of the US/ Streambed	0.361	0.361	0.615	NA
Wetlands	NA	NA	NA	NA
Total	**0.361**	**0.361**	**0.615**	**NA**

Conclusions

The City will need to obtain: a CWA Section 404 Nationwide Permit (NWP; potentially NWP 43 if impacts are under 0.10 acre with a waiver if impacts are over 300 linear feet) from the USACE; a CWA Section 401 Water Quality Certification from the RWQCB, and California Fish and Game Code Section 1602 Lake and Streambed Alteration Agreement from CDFW.

This Page Intentionally Blank

TABLE OF CONTENTS

List of Figures

List of Tables

List of Acronyms and Abbreviations

amsl	above mean sea level
CDFW	California Department of Fish and Wildlife
CFG	California Fish and Game
CFR	Code of Federal Regulations
City	City of San Diego
CWA	Clean Water Act
ESL	Environmentally Sensitive Lands
FEMA	Federal Emergency Management Agency
GPS	Global Positioning System
OHWM	Ordinary High Water Mark
Project	Maple Canyon–Restoration Phase 1 Project
RPW	Relatively Permanent Waterway
RWQCB	Regional Water Quality Control Board
SCOTUS	Supreme Court of the United States
SD	Storm Drain
TNW	Traditional Navigable Waterway
USACE	U.S. Army Corps of Engineers
USDA	U.S. Department of Agriculture
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
WoSC	Waters of the State of California
WoUS	Waters of the United States

This Page Intentionally Blank

1.0 INTRODUCTION

At the request of Rick Engineering Company, this jurisdictional delineation report was prepared by Tierra Data Inc. (TDI) in support of the City of San Diego's (City's) Maple Canyon–Restoration Phase 1 (Project) in the Banker's Hill community of the City.

This report presents the regulatory framework, methods, and results of a delineation of jurisdictional waters, wetlands, and associated riparian habitat within the proposed Project area. The purpose of the delineation is to determine the extent of City, state, and federal jurisdiction within the proposed Project area potentially subject to regulation by the U.S. Army Corps of Engineers (USACE) under Section 404 of the Clean Water Act (CWA), Regional Water Quality Control Board (RWQCB) under Section 401 of the CWA and Porter Cologne Water Quality Control Act, California Department of Fish and Wildlife (CDFW) under Section 1602 of the California Fish and Game (CFG) Code, and the City under its Environmentally Sensitive Lands (ESL) regulations.

1.1 Project Description

The portion of the proposed Project that is the focus of this report is to replace and extend 14 existing Storm Drains (SDs) that are either failing or prone to failure. This entails replacement of street curb intakes, the pipes that take the water from the City streets above the canyon and direct it into the canyon which flows from eastern Banker's Hill and empties into W. Maple Street in southwest Banker's Hill. Maple Canyon is 1,700 feet from the nearest Multi-Habitat Planning Area of the City's Multiple Species Conservation Program Subarea Plan in Cypress Canyon east of State Route 163. The closest Multiple Species Conservation Program Biological Core Area is on North Island, Coronado Island across San Diego Bay 3.0 miles west, and the nearest Biological Linkage is the San Diego River 1.9 miles to the north.

While the final design for the Project is under review, construction will require vehicular access to the alignments that would include excavators, backhoes, bobcats, dump trucks, concrete trucks, and support vehicles. Access to the improvements at the street and between residences will be from the streets. Access to the alignments in the canyons will be from Maple Street at the outlet of the canyon for 12 storm drains, and from access points near the top of the canyon for the two storm drains furthest from the canyon mouth. Work will entail establishing the access to the work areas, excavation of a trench for placement of the drain pipe, and grading for placement of the outfall structures and riprap energy dissipaters. After SD replacement is complete, all areas disturbed by the SD replacement will be graded back to previous contours and revegetated to replace the habitats removed/disturbed.

1.2 Location

The proposed Project site is located east of Interstate 5, west of Highway 163, north of Laurel Street, and south of Spruce Street in the Banker's Hill Community of the City, a residential neighborhood developed on the dissected marine terraces which occur in coastal San Diego (Figure 1). The proposed Project will replace 14 SDs in locations that drain from adjacent streets along the canyon that have failed or are in danger of failing within Maple Canyon (Figure 2).

- SD 1 – Brant Street – into Maple Canyon to the south.
- SD 2 – Albatross Street and W. Maple Street East of Maple Canyon–into the canyon to the northwest.
- SD 3 – Albatross and Olive Street – into Maple Canyon to the south.
- SD 4 – Front Street, 1st Avenue and Nutmeg Street–into a small arm of Maple Canyon to the west.
- SD 5 – 1st Avenue – north into the Maple Canyon.
- SD 6 – 2nd Avenue – north into Maple Canyon.
- SD 7 – 3rd Avenue – to the northwest into Maple Canyon.

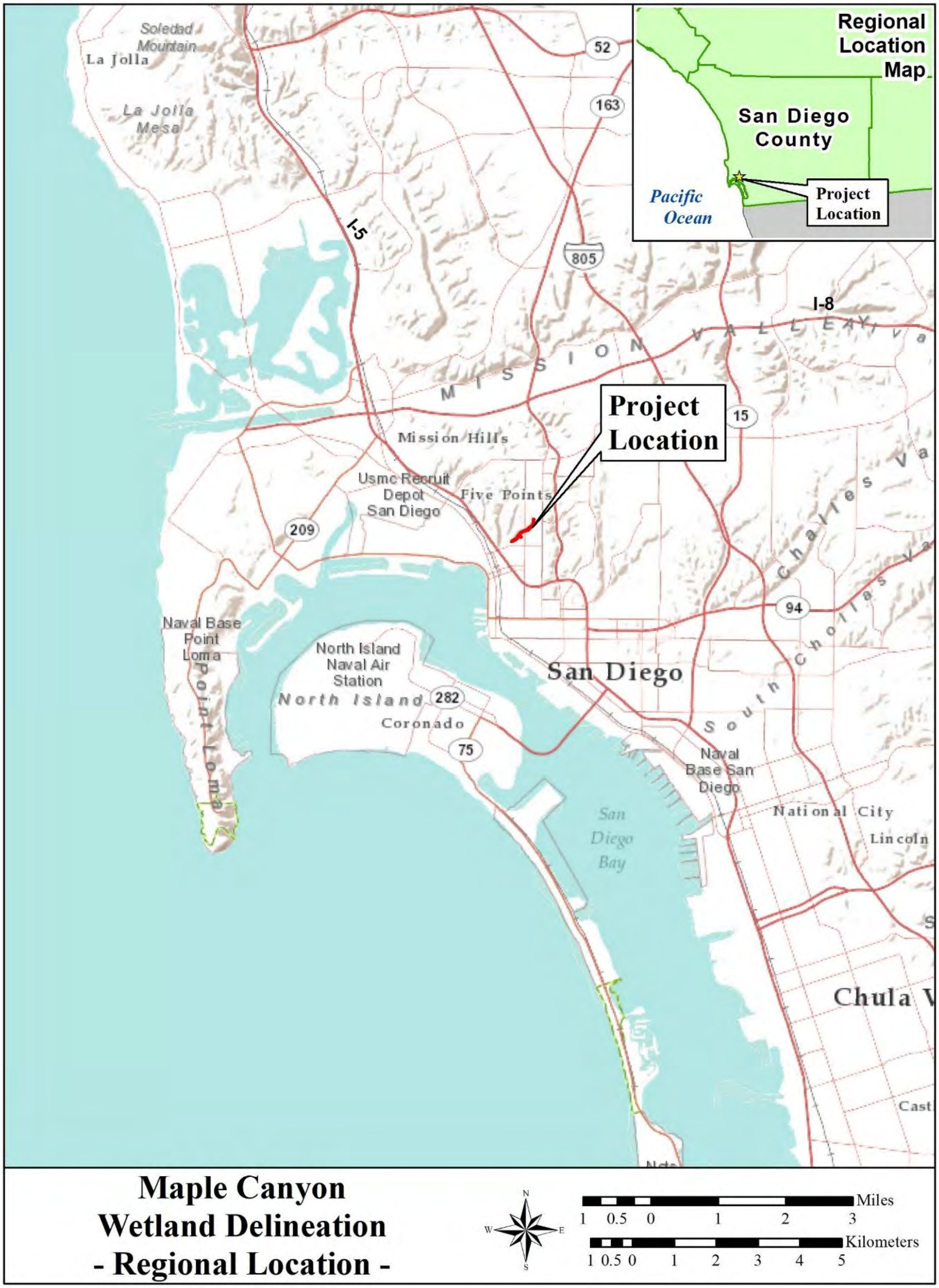


Figure 1. Proposed Project Location.

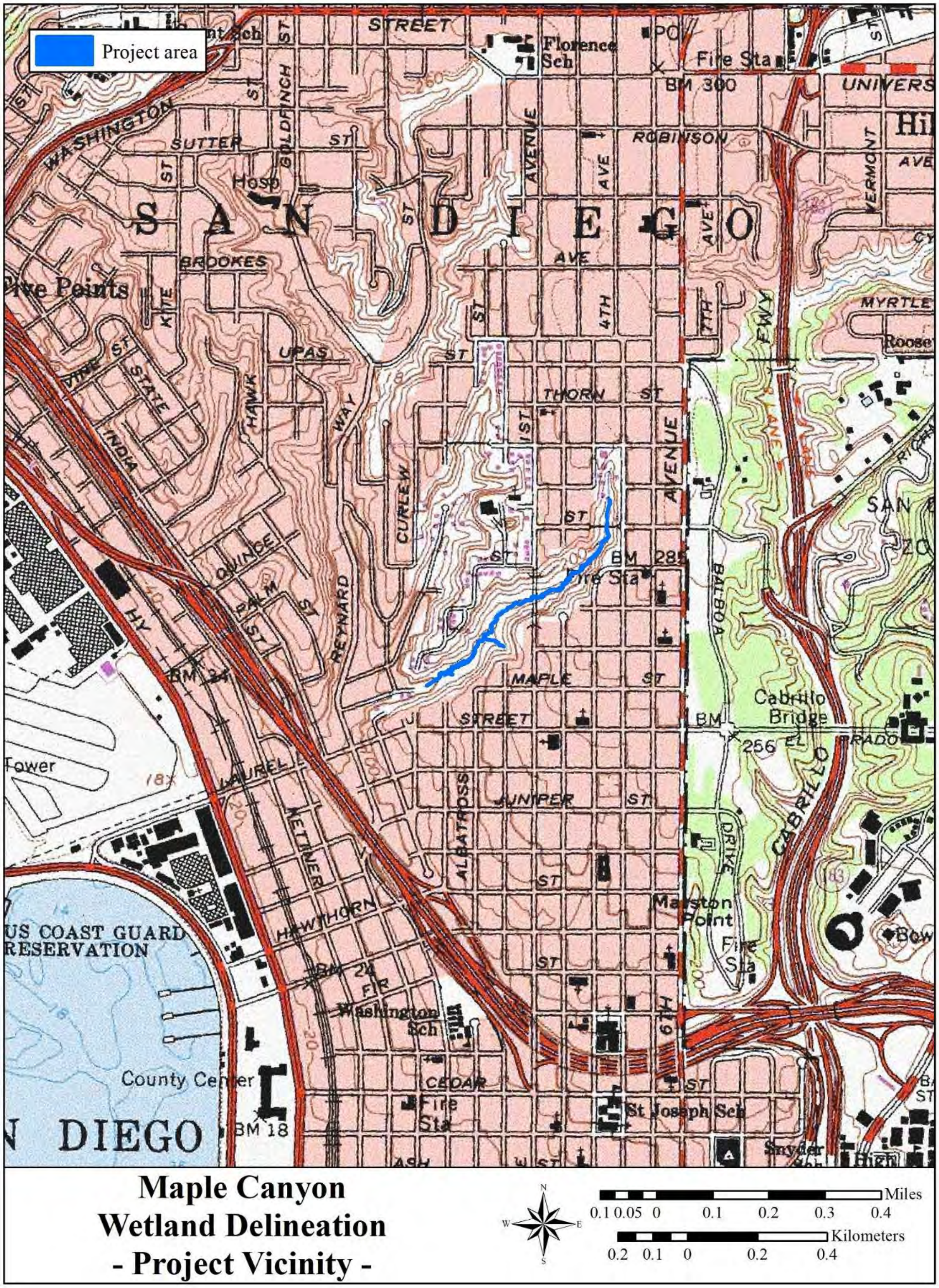


Figure 2. Proposed Project Vicinity.

- SD 8 – 2nd Avenue – south into Maple Canyon.
- SD 9 – 3rd Avenue (north of SD 7) – northwest into Maple Canyon.
- SD 10 – 3rd Avenue (north of SD 9) – west into Maple Canyon.
- SD 11 – Quince Street – east into Maple Canyon.
- SD 12 – 4th Avenue and Quince Street – west into Maple Canyon.
- SD 13 – 3rd Street – east into Maple Canyon.
- SD 14 – 4th Avenue and Redwood Street – west into Maple Canyon.

2.0 ENVIRONMENTAL SETTING

2.1 Existing Conditions

The marine terraces of the area are dissected by canyons with steep slopes (25-50%) that were either previously graded at the time of development or were left in a natural condition (Historic Aerials 2019). Maple Canyon has largely been left in a natural state and winds to the southwest through Banker's Hill for over 2,800 feet (0.9 kilometer) until its outlet at W. Maple Street. The terrace elevation near the top of Maple Canyon is approximately 280 feet above mean sea level (amsl) while the elevation at the mouth of the canyon on W. Maple Street is at 80 feet amsl. (See Figure 2; U.S. Geological Survey [USGS] Point Loma quadrangle).

The terraces and the streets at the mouth of the canyon are developed with residential housing. Rain and urban runoff from the streets above flow into Maple Canyon and discharges onto W. Maple Street. Runoff from the canyon then flows 700 feet (211 meters) down the street to a storm drain at 60 feet amsl at the corner of W. Maple and State streets. The slopes of the canyons support a variety of native and non-native vegetation communities. In the canyon bottoms, water from various sources, including runoff from the slopes and drainage from the streets through SDs during rain events have combined to form channels. During high or intense rainfall events, water rushes down Maple Canyon and causes extensive erosion which moves water and sediment into the residential neighborhood along W. Maple Street.

2.2 Hydrology

The proposed Project is in the central coastal portion of the City less than a mile east of the weather station at Lindbergh Field which receives an average of 10.4 inches of rain per year (U.S. Climate Data 2017).

The proposed Project locations occur within Lindbergh Hydrologic Subarea of the San Diego Mesa Hydrologic Area of the Pueblo San Diego Hydrologic Unit within the San Diego Hydrologic Basin Planning Area (SWRCB 1995). The Hydrological Unit Code is 18070304 (USDA 2017a)

Runoff from the streets and residences on the terraces above the canyons flow into the existing SDs and generally to the southwest towards W. Maple Street, through which water flows west into a Storm Drain at W. Maple Street and State Street. Water then flows through below ground pipes and into the San Diego Bay just less than 0.5 mile away.

2.3 Description of Waters

Waters consist predominantly of an ephemeral primary drainage in the bottom of Maple Canyon (Drainage 1) with two small ephemeral tributary drainages (Drainages 2 and 3) coming down the steep sides of the canyon in the southern third of the canyon.

The main drainage channel changes and varies quite dramatically as it flows for 2,800 feet through the canyon as water enters the drainage from additional storm drains from the streets, pipes taking water from residence roofs and gutters into the canyon, and natural drainage from the canyon sides. The drainage is characterized by a bed of variable width of 1 to 20 feet with steep to vertical banks that vary from less than 1 foot to over 20 feet. The drainage has an overall 7% grade in the canyon over its 2,800-foot length.

Many portions of the canyon bottom support non-native grassland and vegetation such as bluegum eucalyptus (*Eucalyptus globulus*; upland [UPL]) and Canary Island Palms (*Phoenix canariensis*; not listed [UPL]). Some native shrubs and trees occur in the canyon bottom as well, such as coastal live oak (*Quercus agrifolia*; not listed [UPL]) and Laurel Sumac (upland [UPL]). The canyon sides are a mixture of eucalyptus woodland and non-native grassland, and patches of native coastal sage scrub or exotic shrub vegetation.

A man-made Detention Basin, created in 2007/2008, is present at the southern end of the canyon just before W. Maple Street begins. In recent years the basin has filled with sediment such that water from Maple Canyon during and after rain events now flows in a channel in the sediment and overtops and undermines the riprap dam of the basin and the road asphalt beyond the basin on its way to W. Maple Street. The basin currently is mostly bare, silty sand and supports a combination of native and non-native herbaceous upland (UPL) species.

This concentration of water entering the canyon combined with highly erosive soils has created wider channels in the canyon than would ordinarily occur. Water is present only during or immediately after rainfall events and are ephemeral in character.

3.0 REGULATORY FRAMEWORK

3.1 U.S. Army Corps of Engineers

The USACE regulates the discharge of dredged or fill material in Waters of the United States (WoUS) pursuant to Section 404 of the CWA.

3.1.1 Waters of the U.S.

CWA regulations (33 Code of Federal Regulations [CFR] 328.3(a)) define WoUS as follows:

1) All waters which are currently used, or were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide;
2) All interstate waters including interstate wetlands;
3) All other waters such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, wetlands, sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds, the use, degradation or destruction of which could affect interstate or foreign commerce including any such waters:
    i) Which are or could be used by interstate or foreign travelers for recreational or other purposes; or
    ii) From which fish or shellfish are or could be taken and sold in interstate or foreign commerce; or
    iii) Which are used or could be used for industrial purpose by industries in interstate commerce;
4) All impoundments of waters otherwise defined as WoUS under the definition;
5) Tributaries of WoUS;
6) The territorial seas;
7) Wetlands adjacent to WoUS (other than waters that are themselves wetlands).

The Corps delineates non-wetland waters in the Arid West Region by identifying the Ordinary High Water Mark (OHWM) in ephemeral and intermittent channels (USACE 2008a). The OHWM is defined in 33 CFR 328.3(e) as:

> "…that line on the shore established by the fluctuations of water and indicated by physical characteristics such as clear, natural line impressed on the bank, shelving, changes in the character of soil, destruction of terrestrial

> vegetation, the presence of litter and debris, or other appropriate means that consider the characteristics of the surrounding areas."

Identification of OHWM involves assessments of stream geomorphology and vegetation response to the dominant stream discharge. Determining whether any non-wetland water is a jurisdictional WoUS involves further assessment in accordance with the regulations, case law, and clarifying guidance as discussed below.

3.1.2 Wetlands and Other Special Aquatic Sites

Wetlands are defined at 33 CFR 328.3(b) as "those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas."

Special aquatic sites are geographic areas, large or small, possessing special ecological characteristics of productivity, habitat, wildlife protection, or other important and easily disrupted ecological values. These areas are generally recognized as significantly influencing or positively contributing to the general overall environmental health or vitality of the entire ecosystem of a region. Special aquatic sites include sanctuaries and refuges, wetlands, mudflats, vegetated shallows, coral reefs, and riffle and pool complexes. They are defined in 40 CFR 230 Subpart E.

3.1.3 Supreme Court Decisions

Solid Waste Agency of Northern Cook County

On 09 January 2001, the Supreme Court of the United States (SCOTUS) issued a decision on *Solid Waste Agency of Northern Cook County v. USACE, et al.* addressing whether the USACE could assert jurisdiction over isolated waters. The SCOTUS ruling stated that the USACE does not have jurisdiction over "non-navigable, isolated, intrastate" waters.

Rapanos/Carabell

In the SCOTUS cases of *Rapanos v. United States* and *Carabell v. United States*, the SCOTUS attempted to clarify the extent of USACE jurisdiction under the CWA. The nine SCOTUS justices issued five separate opinions (one plurality opinion, two concurring opinions, and two dissenting opinions) with no single opinion representing a majority decision. Considering this situation, the USACE asserts jurisdiction over a traditional navigable waterway (TNW), wetlands adjacent to TNWs, non-navigable tributaries of TNWs that are a relatively permanent waterway (RPW) where the tributaries typically flow year-round or have continuous flow at least seasonally (e.g., typically three months) and wetlands that directly abut such tributaries. The USACE will decide jurisdiction over the following waters based on a fact-specific analysis to determine whether they have a "significant nexus" with a TNW: non-navigable tributaries that are not RPWs, wetlands adjacent to non-navigable tributaries that are not RPWs, and wetlands adjacent to but that do not directly abut a non-navigable RPW.

A significant nexus determination includes an assessment of flow characteristics and functions of the tributary itself and the functions performed by all wetlands adjacent to the tributary. This assessment is to indicate whether they significantly affect the chemical, physical, and biological integrity of downstream TNWs. Analysis of potentially jurisdictional streams includes consideration of hydrologic and ecological factors. The consideration of hydrological factors includes volume, duration, and frequency of flow, proximity to TNWs, size of watershed, average annual rainfall, and average annual winter snow pack. The consideration of ecological factors also includes the ability for tributaries to carry pollutants and flood waters to a TNW, the ability of a tributary to provide aquatic habitat that supports a TNW, the ability of wetlands to trap and filter pollutants or store flood waters, and maintenance of water quality.

3.2 Regional Water Quality Control Board

The State Water Resources Control Board through the San Diego RWQCB regulates activities pursuant to Section 401(a)(1) of the CWA. Section 401 of the CWA specifies that certification from the state is required for any applicant requesting a federal license or permit to conduct any activity including, but not limited to, the construction or operation of facilities that may result in any discharge into navigable waters. Through the Porter Cologne Water Quality Control Act, the RWQCB asserts jurisdiction over Waters of the State of California (WoSC), which is generally the same as WoUS, but may also include isolated waterbodies. The Porter Cologne Act defines WoSC as “surface water or ground water, including saline waters, within the boundaries of the state.”

3.3 California Department of Fish and Wildlife

The CDFW regulates water resources under Section 1600-1616 of the CFG Code. Section 1602 states:

> “An entity may not substantially divert or obstruct the natural flow of, or substantially change or use any material from the bed, channel, or bank of, any river, stream, or lake, or deposit or dispose of debris, waste, or other material containing crumbled, flaked, or ground pavement where it may pass into any river, stream, or lake” (CDFW 2016).

Evaluation of CDFW jurisdiction follows guidance in the CFG Code and “A Review of Stream Processes and Forms in Dryland Watersheds” (CDFW 2010). In general, under Section 1602 of the CFG Code, CDFW jurisdiction extends to the maximum extent or expression of a stream on the landscape. It has been the practice of CDFW to define a stream as “a body of water that flows perennially or episodically and that is defined by the area in a channel which water currently flows, or has flowed over a given course during the historic hydrologic course regime, and where the width of its course can reasonably be identified by physical or biological indicators” (Brady and Vyverberg 2013). Accordingly, a channel is neither defined by a specific flow event, nor by the path of surface water as this path might vary seasonally; rather, it is CDFW’s practice to define the channel based on the topography or elevations of land that confine the water to a definite course when the waters of a creek rise to their highest point, i.e. the top of the bank of the channel.

3.4 City of San Diego

The City regulates impacts to wetlands when identified as ESL in its Biology Guidelines (City 2012). The definition of wetlands in ESL is intended to differentiate uplands (terrestrial areas) from wetlands, and furthermore to differentiate naturally occurring wetland areas from those created by human activities.

The City does not consider artificially created wetlands to be City wetlands but does consider naturally occurring wetland vegetation communities dominated by hydrophytic plants as wetlands. In addition, areas lacking naturally occurring wetland vegetation communities are still considered wetlands if hydric soil or wetland hydrology is present and past human activities have occurred to remove the historic vegetation.

The City does not regulate ephemeral/intermittent drainages unless wetland vegetation is present or has been removed by human activity. Areas that contain wetland vegetation, soils or hydrology created by human activities in historically non-wetland areas do not qualify as wetlands under this definition unless they have been delineated as wetlands by the USACE, and/or the CDFW.

4.0 METHODS

Prior to conducting delineation fieldwork, the following literature and materials were reviewed:

1. Online aerial imagery and maps of the Project sites and 2-foot elevation contours to determine the potential locations of jurisdictional waters or wetlands;
2. USGS topographic map (Figure 3) to determine the presence of any “blue line” drainages or other mapped water features;
3. U.S. Department of Agriculture (USDA) soil mapping data (USDA 2018);
4. Hydric Soils List of California (USDA 2017b);
5. U.S. Fish and Wildlife Service (USFWS) National Wetlands Inventory maps to identify areas mapped as wetland features (2018).

TDI biologists Derek Langsford and Joseph Kean performed exploratory wetland delineation surveys on 16 November 2018. TDI biologists Derek Langsford and Ben Van Allen performed focused wetland delineation surveys on 04 and 16 January 2019.

The delineation by TDI was requested by the City and followed work performed Merkel & Associates in 2012 and AECOM in 2013 with updates by AECOM in 2015. Field data were collected using a Trimble GeoXH sub-foot accuracy handheld global positioning system (GPS) unit. All acquired field data were post-field processed.

TDI's initial November 2018 survey consisted of assessing the jurisdictional widths at the locations of five potential impact areas and walking up and down the main drainage and sub-drainages within the canyon assessing the canyon drainage and prior delineation work.

The 04 January visit included formal delineation of the canyon drainage using GPS and tape measure to map the main canyon and tributary drainage centerlines and widths. On 16 January TDI visited areas previously identified as potential wetlands and dug soil pits. See Appendix C for copies of Wetland and OHWM datasheets.

USACE regulated WoUS, including wetlands, and RWQCB WoSC were delineated per the methods outlined in *A Field Guide to the Identification of the Ordinary High Water Mark in the Arid West Region of the Western United States* (USACE 2008a). The extent of WoUS was determined based on indicators of an OHWM. The OHWM width was measured at areas of potential impact and recorded on OHWM Datasheets (USACE 2010).

Federally regulated wetlands were identified based on Wetlands Delineation Manual (USACE 1987) and Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region (USACE 2008b). Additional data was recorded to determine if an area satisfied the wetland criteria parameters (see wetland delineation forms in Appendix C). Three criteria must be satisfied to classify an area as a wetland under the jurisdiction of the USACE: 1) a predominance of hydrophytic vegetation, 2) the presence of hydric soils, and 3) the presence of wetland hydrology. Details of these criteria are described below:

1. **Hydrophytic Vegetation.** The hydrophytic vegetation criterion is satisfied at a location if an area supports vegetation and more than 50% of the dominant species present within have a wetland indicator status of OBL (plants that almost always occur in wetlands), FACW (plants that usually occur in wetlands, but may occur in non-wetlands), or FAC (plants that occur in wetlands and non-wetlands) (USACE 2008b). Other wetland indicator statuses that do not to the 50% wetland indicator criterion include facultative upland (FACU; plants that usually occur in non-wetlands, but may occur in wetlands), upland (UPL; plants that almost never occur in wetlands), and NL for plants that are not listed on the National Wetland Plant List. The wetland indicator status used for this report follows the 2013 National Wetland Plant List (Arid West Region) (Lichvar et al. 2014).
2. **Hydric Soils.** The hydric soil criterion is satisfied at a location if soils in the area can be inferred or observed to have a high groundwater table, if there is evidence of prolonged soil saturation, or if there are any indicators suggesting a long-term reducing environment in the upper part of the soil profile. Reducing conditions are assessed using soil color and evaluated using the Munsell Soil Color Charts (Munsell 1994).
3. **Wetland Hydrology.** The wetland hydrology criterion is satisfied at a location based upon conclusions inferred from field observations that indicate an area has a high probability of being inundated or saturated (flooded, ponded, or tidally influenced) long enough during the growing season to develop anaerobic conditions in the surface soil environment, especially the root zone (USACE 1987, 2008b).

CDFW jurisdiction was delineated by observing and mapping the elevations of banks that confine a stream to a definite course when its waters rise to their highest level and to the extent of associated wetland/riparian vegetation (Brady and Vyverberg 2013). Because of the erosion of drainage banks, CDFW jurisdictional streambed was extended to the top of where soil had collapsed because of erosion at the base of the bank.

City wetlands were derived from the mapping of USACE and CDFW wetlands.

5.0 RESULTS

5.1 Vegetation

The area is a mixture of Developed Land on the mesas either side of and beyond the southern end of Maple Canyon with large swaths of bluegum-dominated Eucalyptus Woodland on the canyon slopes interspersed with patches of Non-native Grassland, Ornamental species, and a couple of patches of Diegan Coastal Sage Scrub (Holland 1986; Oberbauer et al. 2008). A trail passes down the canyon with access provided from Third Avenue in the north and connects through to W. Maple Street in the south. Overall, the canyon supports little native habitat with mostly non-native species having been planted, arrived though wind or animal transportation, or encroached from landscaping and back yards on the canyon rim.

No wetlands communities were identified along the drainage.

5.2 Soils

The proposed Project area is within the San Diego Formation geologic formation characterized by undivided yellowish–brown and gray, fine- to medium-grained, poorly indurated fossiliferous marine sandstone and reddish brown, transitional marine and non-marine pebble and cobble conglomerate. The terraces above Maple Canyon are within very old paralic deposits (e.g. interlaced layers of marine and freshwater coastal sediments). The USDA (2017b) identifies Maple Canyon as having Terrace Escarpment Series soils, while the terraces above it have Urban Land soils (Figure 3):

- Terrace Escarpments are undifferentiated soils of variable composition.
- Urban Land are soils described as ground surface covered by pavement, concrete, buildings, and other structures underlain by wet disturbed and natural soils material (wet substratum). The soil profile is typically disturbed and does not resemble any mapped soil unit due to anthropogenic modification of the profile.

5.3 National Wetlands Inventory

The USFWS National Wetlands Inventory identifies 1.11 acres of Intermittent Riverine Streambeds Temporary Flooded (R4SBA) along the bottom of Maple Canyon; however, the creek is ephemeral not intermittent (Figure 4).

5.4 Federal Emergency Management Agency

Based on the Flood Insurance Rate Map Number 06073C1885G, the Maple Canyon drainage is considered within a 100-year floodplain (Federal Emergency Management Agency [FEMA] Flood Zone Designation A) limited to the drainage from approximately one third of the distance within the canyon east of 1st Ave down to beyond its exit from the Canyon on W. Maple Street (FEMA 2019).

5.5 Jurisdictional Determination

Jurisdictional Delineation Maps (Appendix A; Figure 5-Figure 8) identify all drainages within the areas studied. Table 1 includes a list of features identified at the proposed Project locations as labelled in the figures.

The USACE, in combination with the Environmental Protection Agency, when necessary, reserves the ultimate authority in making the final jurisdictional determination of WoUS and the RWQCB reserves the ultimate authority in making the final jurisdictional determination of WoSC. Additionally, CDFW has ultimate discretion in the determination of their jurisdiction.

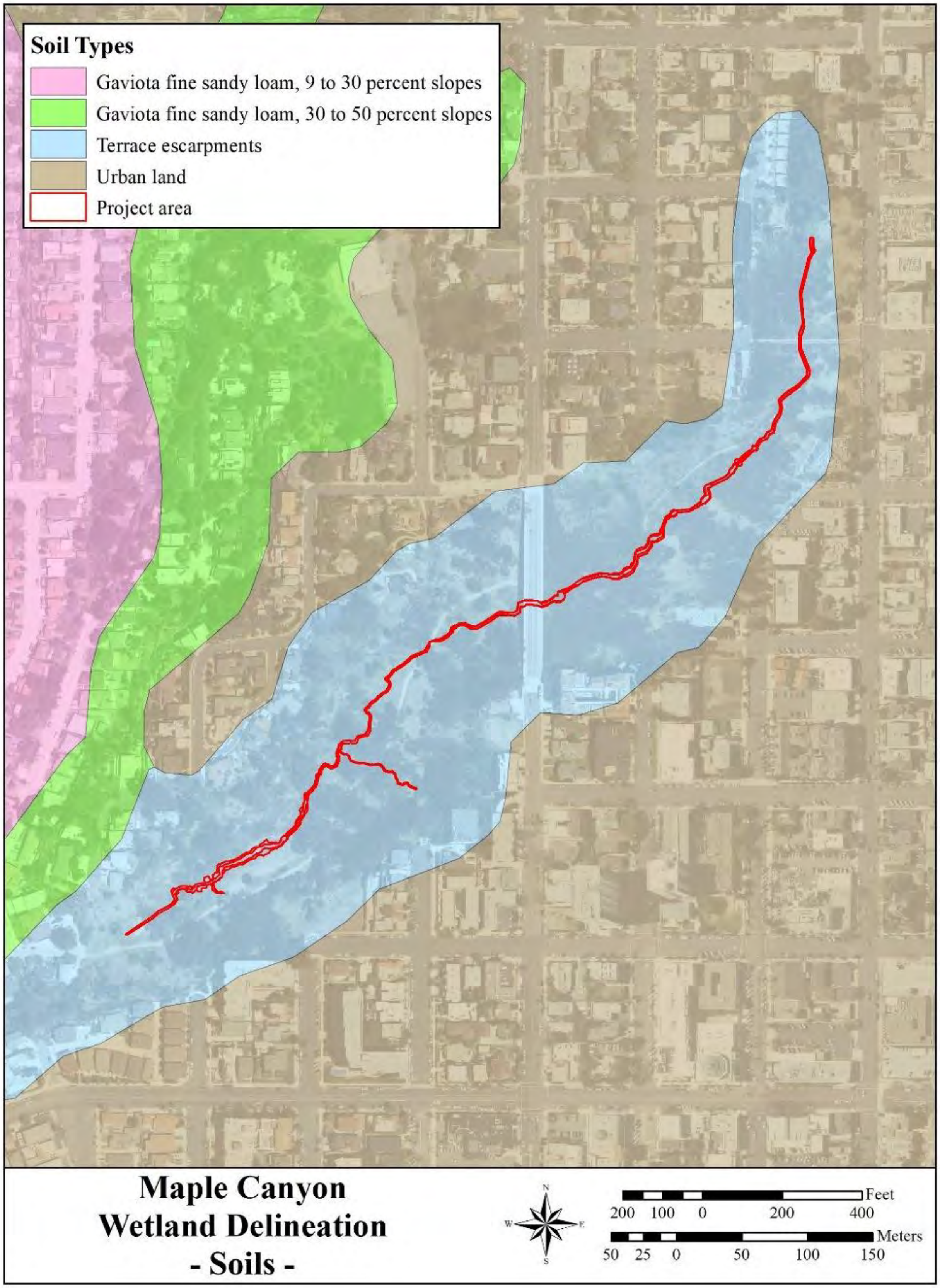


Figure 3. Soils on the Proposed Project Location.

Figure 4. National Wetland Inventory Features.

Drainage 1

Drainage 1 is the main channel through the canyon that starts north of the Quince Street (pedestrian) Bridge and ends at the filled detention basin near the eastern terminus of the western portion of W. Maple Street near Dove Street.

The head of the canyon begins south of the buildings on Spruce Street between Third and Fourth avenues (Figure 5). The topography and watershed area only allow for a shallow swale with no identifiable flow channel, erosion, or vegetative indicators (Appendix B: Photo 1.1). Just south of where Redwood Street intersects Fourth Avenue, a storm drain inlet on the west side of Fourth Ave moves storm water into a pipe that runs down the western slope of Maple Canyon and close to the canyon bottom turns south (Photo 1.2). It appears that a Brazilian pepper tree grew close to the original pipe outlet and broke the outlet which has resulted in significant erosion and destroyed any energy dissipation device that occurred (Photo 1.3). A hollow has been excavated immediately south of the pepper tree, and water exits this hollow having carried material, including plastic piping and concrete debris further down the canyon (Photos 1.4 and 1.5). It is only after this chaotic erosion and debris field ends does the drainage settle into a narrow channel with identifiable features of jurisdiction that continues downstream (Appendix B: Photo 1.6).

Between the Quince Street and 1st Avenue bridges, the creek passes among bluegum trees (*Eucalyptus globulus*; upland [UPL]) and Canary Island Palms (*Phoenix canariensis*; not listed [UPL]) (Photo 1.8 through 1.12) and in one place the bank has eroded threatening the trail (Photos 1.9). A recently installed storm drained outlet was not installed per specifications and needs to be corrected (Photo 1.11). Storms have damaged or toppled eucalyptus trees and their broken branches and fallen trunks are evident in several places along the creek affecting water flow (Photos 1.10 through 1.14). Severe erosion has occurred in places creating high, vertical banks (Photo 1.13), and eroding away soil that contained utility pipes (Photo 1.14)

West of the 1st Avenue Bridge the drainage approaches and crosses the trail (Photos 1.15 through 1.17) which is wide enough for vehicular access. The compacted soil, and potential trail maintenance, has limited the erosion which considerably narrows the drainage until it reaches the softer erodible soil on the west side of the trail (Photo 1.17).

Downstream of the trail crossing Drainage 1 is contained in a relative narrow (4 feet wide) contained channel as it passes into the flatter portion of the canyon bottom (Photo 1.18). An old CMP SD outlet occurs in this section (Photo 1.17). Approximately 350 feet from the trail crossing, Drainage 2 enters Drainage 1 from the south (Photo 1.19). This section of Drainage 1 has undergone changes in previous years with evidence of prior alternate beds especially where Drainage 2 enters Drainage 1. After this section Drainage 1 enters into a section that has undergone considerable erosion (Photos 1.20 through 1.25) and has broadened and deepened the channel ultimately to its maximum width (32 feet) and depth (20 feet) in the canyon (Photo 1.25). The canyon walls are very fragile and have collapsed in many locations creating large blow-outs in the canyon walls (Photo 1.21). The inner channel narrows and gets very deep forming a slot type feature (Photo 1.22) before widening to its maximum (Photos 1.24 and 1.25). This section has a length of approximately 350 feet before the canyon floor flattens again, flow becomes more controlled and the channel settles, becoming narrower and shallower, curving through the last section (Photos 1.26 and 1.27) until it reaches the detention basin area that was constructed in 2007/2008.

Upon entering the detention basin area, the channel is approximately 4-feet wide with banks that are barely 12 inches high (Photo 1.28). These banks shrink as the water passes through the alluvium (Photo 1.29) that has filled the basin until the western end of the basin is reached. At this location the water in the channel has spilled over the riprap, eroded away the sediment in the basin behind the rip rap, and forced its way through the riprap (Photo 1.30). With no discernable channel, water tumbles down the rip rap and erodes the soil in front of the riprap before reaching asphalt which is now becoming very uneven as water erodes soil from underneath and the asphalt cracks (Photo 1.31). Water then passes onto W. Maple Street where it flows 750 feet until it pours into a storm drain intake at W. Maple and State streets.

Table 2. Jurisdictional Areas.

Label	Location[1]	Cowardin Class	Acreage (width in feet)			Linear Feet (delineated)	Summary of OHWM/ Wetland Presence	Dominant Vegetation	Latitude, Longitude
			USACE	CDFW	City				
Drainage 1		R6	0.349 (1'-20')	0.597 (1'-32')	NA	2,834	Bed, bank, sorting, some cobble in bottom, sand deposits, water marks	None in drainage, mostly Eucalyptus Woodland/Non-native Grassland adjacent	32.734338, -117.165056
Drainage 2		R6	0.009 (1'-2')	0.014 (2-3')	NA	255	Bed, bank, sorting	None in drainage, mostly Eucalyptus Woodland/Non-native Grassland adjacent	32.733628, -117.165167
Drainage 3		R6	0.003 (1'- 4')	0.004 (2'- 7')	NA	50	Bed, bank, sorting	None in drainage, mostly Eucalyptus Woodland/Non-native Grassland adjacent	32.732795, -117.166575
Total			0.361	0.615	NA			3,139	

[1] See Appendix A; Figures 5-7 for locations. NA = Not Applicable

A Soil Pit was dug in the detention basin to assess if it supported wetland indicators (Photo 1.32). This was the only location along the canyon where water had been observed accumulating in the past and where hydrophytic vegetation could potentially grow. The vegetation was determined to not be hydrophytic, the soils were not hydric, and hydrological indicators away from the channel were not evident. The lack of soil saturation despite the wetter than average rain season up to when the soil pit was dug suggested that conditions for supporting hydrophytic vegetation had deteriorated since the detention basin was built in 2007/2008 as the basin filled with sediment. It is unlikely that hydrophytic vegetation grew before the detention basin was constructed

Drainage 2

Drainage 2 is the tributary drainage that joins Drainage 1 approximately 700 feet southwest of 1st Avenue. The precise source of the water for this this feature is unknown but is most likely storm water drainage from streets or buildings above on 1st Avenue and/or Front Street. Above where jurisdiction starts, a land slump has occurred in one direction (photo 2.1) while a highly eroded feature (Photo 2.1) provides most of the water. The passage of water only stabilizes after the confluence and as the slope breaks with OHWM indicators becoming evident. Drainage 2 then flows down slope in a clearly identifiable channel (Photos 2.3 and 2.4) that enters a pipe to pass under the trail before completing its journey to the main canyon Drainage 1 (Photos 2.5 and 2.6).

Drainage 3

Drainage 3 is a short tributary to Drainage 1 and appears to have its origins as storm drain intake (Photo 3.1) and runoff from roofs of buildings at the corner of W. Maple Street and Albatross Street. (Photo 3.2). A SD CMP and flexible plastic pipes carry water to the top of a dissembling concrete v-ditch downstream of which the feature is erosional and plunges to the trail at the bottom of the slope (Photos 2.3 and 2.4). Water crosses the trail without causing severe erosion (Photo 3.5) and only just after crossing the trail, does an organized channel with bed and bank begin to form (Photo 3.6). It is at this point the jurisdiction was considered to begin and continue until entering Drainage 1 a short distance to the north.

Several existing storm drains outlet into the canyon, with some creating erosional features that contribute to Drainage 1. These features are highly eroded, do not have any characteristics of an OHWM and were determined not to be WoUS or WoSC.

RWQCB

No isolated or Rapanos conditions that met the criteria for wetland WoUS were observed along Maple Canyon Creek therefore, the RWQCB jurisdiction follows that of USACE jurisdiction.

CDFW

CDFW jurisdiction occurs in the same locations as USACE and RWQCB jurisdiction but tend to extend beyond those identified resources, primarily through slopes banks above the OHWM. In areas where the bank has slumped, the top of the eroded face was taken to be the limit of CDFW jurisdiction.

5.6 Recommendations to Avoid/Minimize Impacts to Jurisdictional Waters

The project proponent should develop and implement an approach and apply Best Management Practices that limit impacts, prevent accidents and contamination, and maintain functions and values of the jurisdictional resources present. Best Management Practices should also be a part of the project construction plans to ensure that they are fully considered and put into effect at locations where the potential exists to impact jurisdictional waters.

Restoration should occur immediately after project completion and final grading, including installation of temporary erosion control such as slope breaks on the steep canyon sides. This will prevent soil loss and sedimentation and allow establishment of vegetation. Details should be provided in a revegetation plan.

5.7 Mitigation Requirements

Mitigation requirements for impacts to USACE and CDFW jurisdiction is discussed in the proposed Project Biological Technical Report (AECOM 2019).

Any impacts to wetlands must be mitigated “in-kind” and achieve a “no-net loss” of wetland function and values.

6.0 POTENTIAL PERMITTING REQUIREMENTS

Temporary impacts would occur to USACE, RWQCB, and CDFW jurisdictional non-wetland WoUS and CDFW streambeds. No City jurisdictional wetlands occur in the canyon. Impacts would occur through access to alignments in the canyon and through needed work areas for SD and outfall installation. Impacts would be restored after work is completed. No permanent direct impacts would occur from this project.

6.1 U.S. Army Corps of Engineers

Nationwide Permit (NWP) 43 may be used for storm water management facilities. This NWP authorizes discharges of dredged or fill material into non-tidal waters of the United States for the construction of stormwater management facilities, including stormwater detention basins and retention basins and other stormwater management facilities; the construction of water control structures, outfall structures and emergency spillways; the construction of low impact development integrated management features such as bioretention facilities (e.g., rain gardens), vegetated filter strips, grassed swales, and infiltration trenches; and the construction of pollutant reduction green infrastructure features designed to reduce inputs of sediments, nutrients, and other pollutants into waters to meet reduction targets established under Total Daily Maximum Loads set under the CWA.

The discharge cannot cause the loss (permanent impact of great than ½ acre) of WoUS. The discharge must not cause the loss of more than 300 linear feet of stream bed, unless for intermittent and ephemeral stream beds the district engineer waives the 300-linear-foot limit by making a written determination concluding that the discharge will result in no more than minimal adverse environmental effects. This NWP does not authorize discharges into non-tidal wetlands adjacent to tidal waters. The loss of stream bed plus any other losses of jurisdictional wetlands and waters caused by the NWP activity cannot exceed 1/2 acre. This NWP does not authorize discharges of dredged or fill material for the construction of new stormwater management facilities in perennial streams. The proposed project would likely qualify under NWP 43 but would likely need a waiver from the District Engineer. A pre-construction notification to the District Engineer prior to commencing the activity would be required.

The USACE must comply with the federal Endangered Species Act and Section 106 of the National Historic Preservation Act when issuing an NWP or Individual Permit. As no federal listed species are expected to occur (AEOCM 2019) a federal Endangered Species Act Section 7 consultation between the USACE and the USFWS is unlikely to occur.

6.2 Regional Water Quality Control Board

The project area is within the jurisdiction of the San Diego RWQCB (Region 9). Under Section 401 of the CWA, the RWQCB must certify that the discharge of dredged or fill material into WoUS does not violate state water quality standards. The State Water Resources Control Board has not generally certified NWP 43, so a Section 401 Certification from the San Diego RWQCB would be required.

6.3 California Department of Fish and Wildlife

A 1602 Lake and Streambed Alteration Agreement will be required for the activities that alter streams and lakes and their associated riparian habitat under CDFW jurisdiction.

7.0 QUALIFICATIONS AND CERTIFICATIONS

The following individuals contributed to the fieldwork and/or preparation of this report.

Derek H. Langsford	Ph.D., Ecology, UC Davis/San Diego State University, 1996 B.Sc., (Hons.), Ecological Science, University of Edinburgh, 1985 ESA Certified Senior Ecologist, San Diego County Approved Biologist
Elizabeth M Kellogg	M.S. International Agricultural Development with specialization in Range Management. UC Davis, 1981 B.S, Agricultural Science and Management, UC Davis, 1978 Certified Wetland Delineation USACE 1987 Manual, Certified Wetland Delineation Refresher Course, Arid West Supplement 2011
Joseph Kean	B.S., Biology, CSU Chico 2008

8.0 REFERENCES

AECOM. 2019. Biological Technical Report for the Maple Canyon Storm Drain Project. City of San Diego, California.

Brady, Roland H. III, and Kris Vyverberg. 2013. Methods to Describe and Delineate Episodic Stream Processes on Arid Landscapes for Permitting Utility-Scale Solar Power Plants. California Energy Commission. Publication Number. CEC-500-2014-013.

California Department of Fish and Wildlife (CDFW). 2010. A Review of Stream Processes and Forms in Dryland Watersheds. Prepared by Kris Vyverberg, Conservation Engineering. 32 p.

City of San Diego (City). 2012. Land Development Code, Biology Guidelines, June.
- Significance Determination Thresholds under CEQA
- Guidelines for Conducting Biological Surveys

Cowardin, L. M., V. Carter, F. C. Golet, and E. T. LaRoe. 1979. Classification of wetlands and deepwater habitats of the United States. U.S. Fish and Wildlife Service. FWS/OBS-79/31. Washington, DC.

Historic Aerials. 2019. www.historicaerials.com. Accessed April 2019.

Holland, Robert F. 1986. Preliminary Descriptions of the Terrestrial Natural Communities of California. State of California, The Resources Agency, Department of Fish and Game (October).

Lichvar, R.W., M. Butterwick, N.C. Melvin, and W.N. Kirchner. 2014. The National Wetland Plant List: 2014 Update of Wetland Ratings. Phytoneuron 2014, Vol. 41: 1-42.

Munsell. 1994. Munsell Soil Color Charts. Kallmorgen Instruments Corporation. New Windsor, NY.

Oberbauer, Thomas, Meghan Kelly, and Jeremy Buegge. March 2008. Draft Vegetation Communities of San Diego County. Based on “Preliminary Descriptions of the Terrestrial Natural Communities of California”, Robert F. Holland, Ph.D., October 1986.

State Water Resources Control Board. 1995. http://www.waterboards.ca.gov/sandiego/water_issues/programs/basin_plan/docs/sdrwqcb_basinplanmap.pdf.

U.S. Army Corps of Engineers (USACE). 1987. Wetlands Delineation Manual, Technical Report Y-8. U.S. Army Engineer Waterways Experiment Station, Vicksburg, Mississippi. 100 pp. + Appendices.

U.S. Army Corps of Engineers (USACE). 2008a. A Field Guide to the Identification of the Ordinary High Water Mark (OHWM) in the Arid West Region of the Western United States. A Delineation Manual. Lichvar and McColley. August.

U.S. Army Corps of Engineers (USACE). 2008b. Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region. September.

U.S. Army Corps of Engineers (USACE). 2010. Updated Datasheet for the Identification the Ordinary High Water Mark in the Arid West Region of the United States.

U.S. Climate Data. 2017. http://www.usclimatedata.com/climate/san-diego/california/united-states/usca0982. Accessed March 2019.

U.S. Department of Agriculture (USDA). 2017a. Science is Your Watershed. https://water.usgs.gov/wsc/acc/180703.html. Accessed March 2019.

U.S. Department of Agriculture (USDA). 2017b. List of Hydric Soils. Available Online: https://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/use/hydric/

U.S. Department of Agriculture (USDA). 2018. https://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx. Accessed March 2019.

U.S. Department of Homeland Security, Federal Emergency Management Agency (FEMA). 2019. National Flood Insurance Program, Flood Insurance Rate Nos. 06073C1636G and 06073C1636H. https://msc.fema.gov/portal. Accessed March 2019.

U.S. Fish and Wildlife Service 2018. National Wetlands Inventory. https://fwsprimary.wim.usgs.gov/wetlands/apps/wetlands-mapper/ accessed March 2019

This Page Intentionally Blank

APPENDIX A. JURISDICTIONAL DELINEATION MAPS

This Page Intentionally Blank

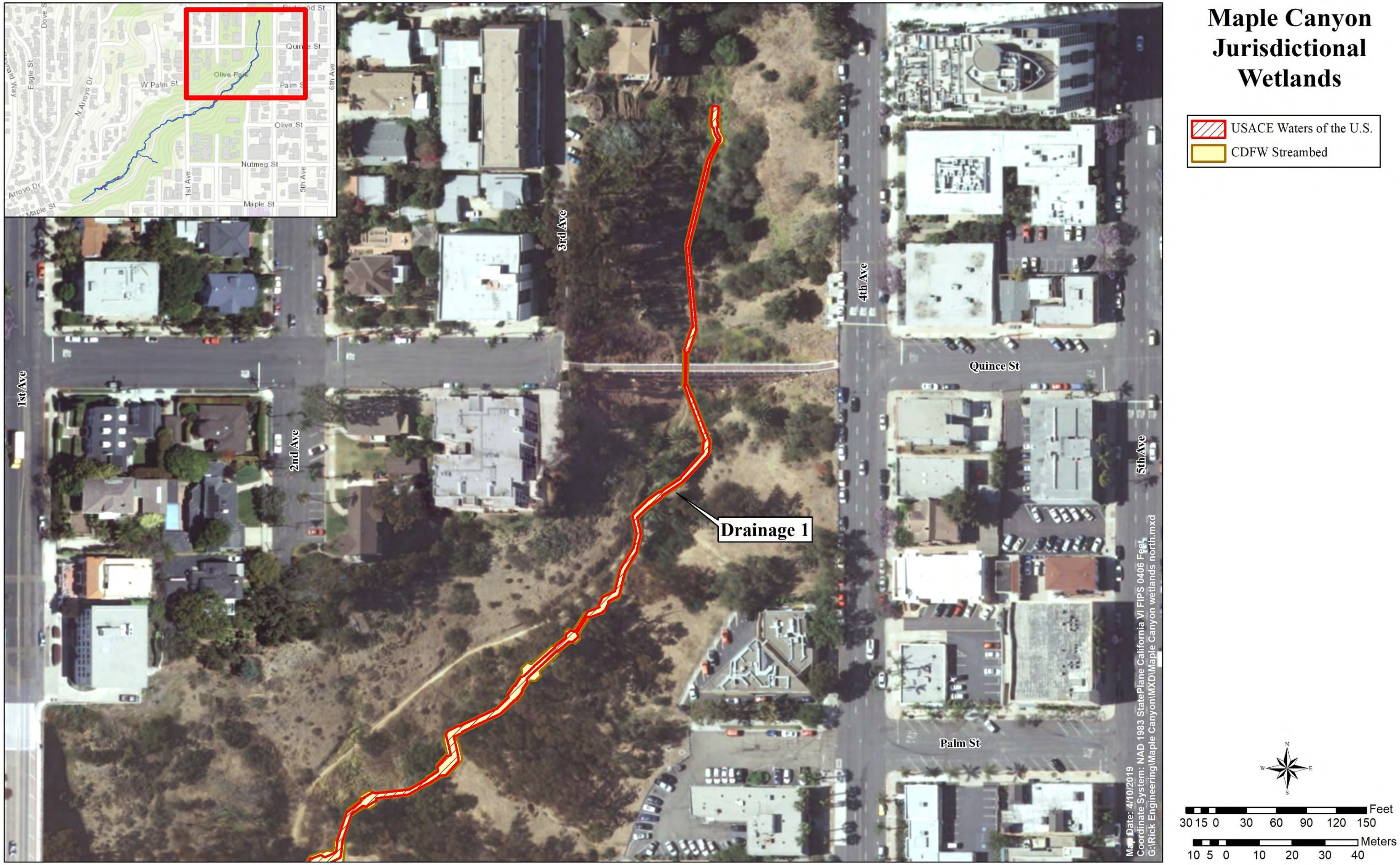


Figure 5. Drainage 1 (Northern Portion).

Figure 6. Drainage 1 (Central Portion) and Drainage 2.

Figure 7. Drainage 1 (Southern Portion) and Drainages 2 and 3.

APPENDIX B. PHOTOS

Drainage 1

Photo 1.1: The head of the canyon looking north with no evidence of a channel, hydrology, or features that would be an OHWM.

Photo 1.2. The existing SD pipe from Fourth Ave comes down this slope and turns right in the middle of the photo. The pipes are mostly covered in concrete that has been applied to prevent erosion.

Photo 1.3: The broken corrugated plastic SD pipe opening is visible at the base of the tree trunks (upper middle of photo). Water has carved a large hole in the canyon floor.

Photo 1.4: The erosional hole that has been carved by the broken pipe. Debris including pieces of broken pipe were visible.

Photo 1.5: Chaotic flow and storm drain debris below the broken pipe.

Photo 1.6: The first location where signs of an OHWM were present: flow stabilized, a defined bed and bank occurred, vegetation was bent, and some sorting of material was occurring.

Photo 1.7: Looking from south towards upper end of the canyon. Drainage is confined within a bed and bank though some concrete and asphalt debris is present.

Photo 1.8: Looking south from below Quince Street Bridge. Drainage passes between Canary Island palms.

Photo 1.9: Looking north up canyon past the Canary Island palms in Photo 1.8, with the Quince Street Pedestrian Bridge in the background. The drainage is undermining the soil beside the trail and will soon cause the collapse of the trail in this section.

Photo 1.10: Looking south downstream as Drainage 1 carves its way down the canyon. A recently installed outfall occurs just beyond the trunk lying across the creek

Photo 1.11: Existing outfall that will be replaced.

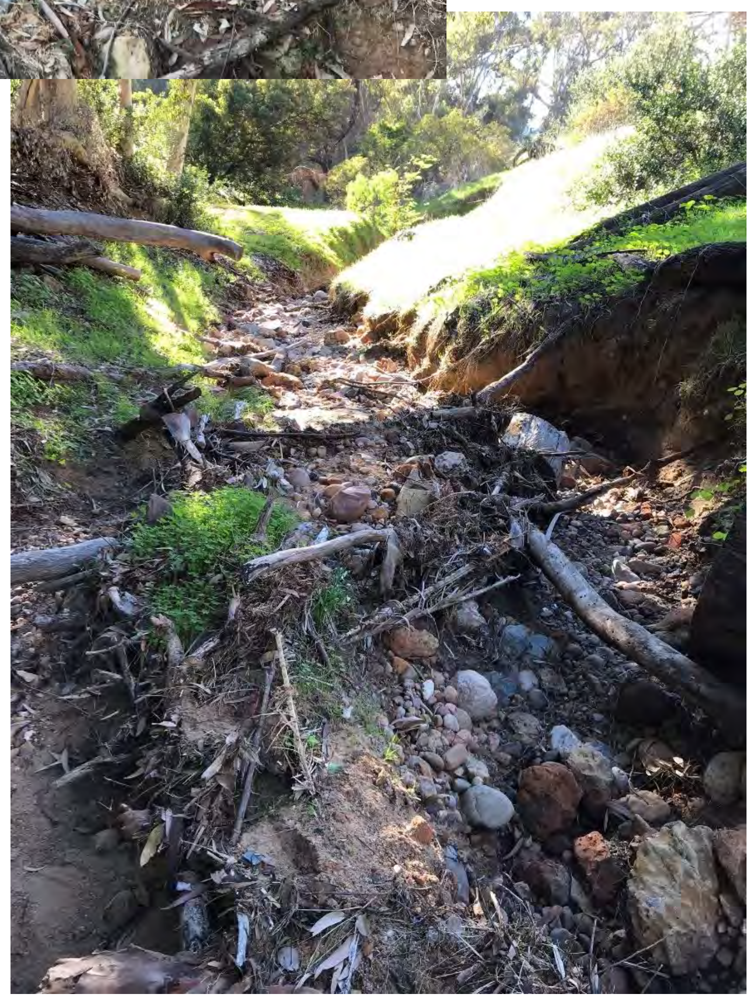


Photo 1.12: looking downstream from the outfall area in Photo 1.11 with the widening creek and evidence of recent bank erosion and collapse.

Photo 1.13: Looking upstream south of Photo 1.12 at eroded face of bank which has formed from water undermining bank at the base and the soil above collapsing into the creek which carries the material away.

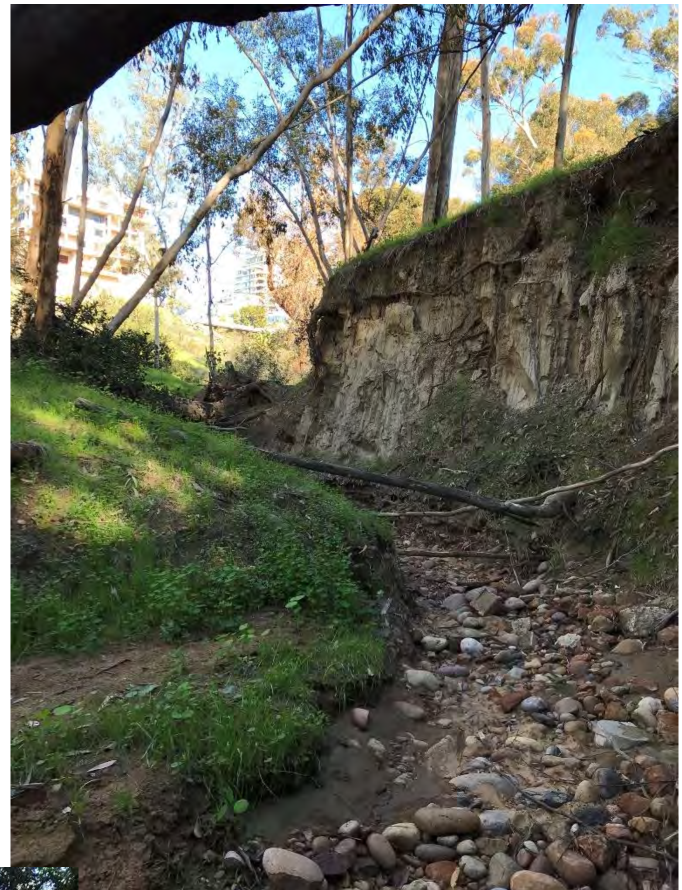


Photo 1.14: Looking south from 1.13 at location where creek has eroded soil that supported this sewer line.

Photo 1.15: the creek's gradient decreases and the flow stabilizes south of the erosive section in Photos 1.11 through 1.14. The trail crosses Drainage 1 is in the distance.

Photo 1.16: Drainage 1 spills across the trail which is likely maintained to allow vehicle crossing.

Photo 1.17: Looking south where Drainage 1 crosses the trail. The ends of two CMPs are visible but where they start is unknown. The drainage quickly reforms a bed and bank after crossing the trail.

Photo 1.18: A CMP, presumably from an SD placed to put water into the creek downstream of the trail crossing. The CMP is titled up so that water does not flow freely.

Photo 1.19: Drainage 2 (foreground) enters Drainage 1 (Photo taken 11/16/18).

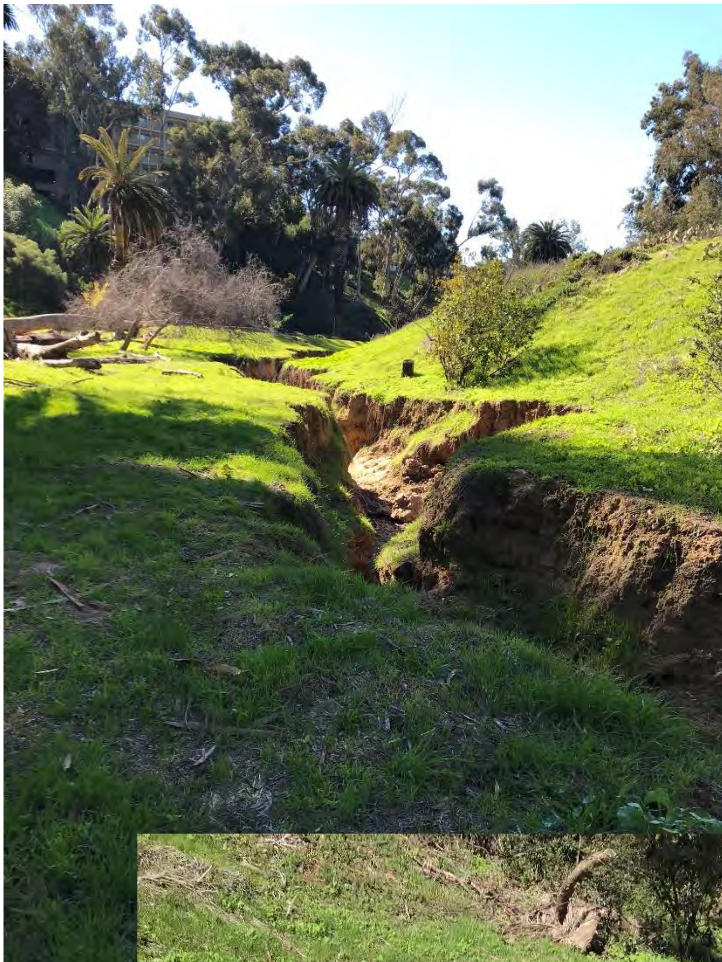


Photo 1.20: After Drainage 2 joins with Drainage 1, the creek enters into highly erosive soil with evidence of extensive erosion.

Photo 1.21: Collapsing banks in this section of the creek.

Photo 1.22: A “slot” canyon forms south of Photo 1.21.

Photo 1.23: looking north and upstream, towards the “slot canyon.”

Photo 1.24: looking south into the canyon as the channel widens.

Photo 1.25: looking south downstream at the widest portion of the canyon.

Photo 1.26: At the end of the wider section, the creek passes where Drainage 3 enters (bottom left) and passes through curves before reaching the final reach and the terminus at the canyon bottom.

Photo 1.27: A laurel sumac has fallen over into the channel in where the bank has been eroded at the start of the final reach.

Photo 1.28: Drainage 1 enters the filled detention basin with banks of less than 1 foot.

Photo 1.29: looking north across Drainage 1 as it passes through the filled detention basin.

Photo 1.30: at the western end of the detention basin the water has overtopped and undermined the riprap.

Photo 1.31: looking east towards the riprap holding back the sediment-filled detention basin. Water has undermined the asphalt of the controlled access at the western end of the canyon.

Photo 1.32: Soil Pit 1 in the detention basin showing deposition layers of sand and sandy loam.

Drainage 2

Photo 2.1: Slumped area above the start of OHWM in Drainage 2.

Photo 2.2: Start of organized flow at confluence of erosional channel on left and slumped area shown in Photo 2.6 below.

Photo 2.3: Clear bad and bank of Drainage 2 downslope of Photo 2.2.

Photo 2.4: just upstream from the trail crossing.

Photo 2.5: Looking south to where Drainage 2 merges with Drainage 1

Photo 2.6: Looking south up Drainage 2 from the confluence with Drainage 1. The tributary crosses the trail between the two trees. Th drainage is in a pipe under the trail.

Drainage 3

Photo 3.1: Close up of outfall of a CMP that is likely from street SD inlet above. Note erosion below where pipe emerges from bank indicting it is broken. As a result, most of the water bypasses the end of the pipe and the concrete that has been poured to carry the water. Cut-off walls have kept the pipe in place, but the pipe is compromised.

Photo 3.2: Black plastic pipes carry water from the building to the right down to the concrete.

Photo 3.3: The end of the concrete which obviously does not carry the majority of the water from above. Water descends down in a chaotic manner beside it.

Photo 3.4: End of concrete is on left, and the feature shows no organization as water tumbles down the hillside.

Photo 3.5: What water the water passes across it in a small grove to the other side. A second groove is visible on the right.

Photo 3.6: What appears to be the start of jurisdiction with increasing cut and erosion of a channel and direct connection to Drainage 1.

APPENDIX C. WETLAND DETERMINATION AND OHWM FORMS

This Page Intentionally Blank

Figure 8. Key Map for Jurisdictional Determination and OHWM Forms

This Page Intentionally Blank

WETLAND DETERMINATION DATA FORM - Arid West Region

Project/Site: Maple Canyon Restoration - Phase 1 City/County: San Diego/San Diego Sampling Date: 1/16/119

Applicant/Owner: City of San Diego State: CA Sampling Point: 1

Investigator(s): Derek Langsford/Ben Van Allen Section, Township, Range: Unsectioned

Landform (hillslope, terrace, etc.): Filled Detention Basin Local relief (concave, convex, none): None Slope (%): < 1

Subregion (LRR): C - Mediterranean California Lat: 32.732533 Long: -117.167178 Datum: WGS84

Soil Map Unit Name: Terrace Escarpments NWI classification:

Are climatic / hydrologic conditions on the site typical for this time of year? Yes (●) No ( ) (If no, explain in Remarks.)

Are Vegetation ☐ Soil ☐ or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes (●) No ( )

Are Vegetation ☐ Soil ☐ or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ( )	No (●)
Hydric Soil Present?	Yes ( )	No (●)
Wetland Hydrology Present?	Yes ( )	No (●)

Is the Sampled Area within a Wetland? **Yes** ( ) **No** (●)

Remarks: The 2018/2019 wet season provided greater than average rainfall from October through January 15 with 11 events of > 0.10 inches and 6 events >0.50 inches. So after several years of drought, precipitation was suitable for wetland plant growth. No hydrophytic species were establishing indicating it would not support wetland vegetation.

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Total Cover:	%		

	Absolute % Cover	Dominant Species?	Indicator Status
1. *NA*			
2.			
3.			
4.			
5.			
Total Cover:	%		

Herb Stratum	Absolute % Cover	Dominant Species?	Indicator Status
1. *Bromus diandrus*	4	Yes	UPL
2. *Malva parvaflora*	1	No	Not Listed
3. *Glebionis coronarium*	1	No	UPL
4. *Hirschfeldia incana*	1	No	Not Listed
5. *Metricaria discoidea*	1	No	FACU
6. *Sonchus asper*	1	No	FAC
7. *Lupinus sp.*	1	No	Not Listed
8.			
Total Cover:	10 %		

Woody Vine Stratum	Absolute % Cover	Dominant Species?	Indicator Status
1. *NA*			
2.			
Total Cover:	%		

% Bare Ground in Herb Stratum 90 % % Cover of Biotic Crust 0 %

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC:	0	(A)
Total Number of Dominant Species Across All Strata:	1	(B)
Percent of Dominant Species That Are OBL, FACW, or FAC:	0.0 %	(A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	0
FACW species		x 2 =	0
FAC species	1	x 3 =	3
FACU species	1	x 4 =	4
UPL species	8	x 5 =	40
Column Totals:	10 (A)		47 (B)

Prevalence Index = B/A = 4.70

Hydrophytic Vegetation Indicators:

- ( ) Dominance Test is >50%
- ( ) Prevalence Index is ≤3.0[1]
- ☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? **Yes** ( ) **No** (●)

Remarks: The detention basin was constructed in 2007/2008 and in recent years has been filled with sediment. Currently, during rain events, water flows through the sediment in a channel and exits through riprap. The water does not collect in the detention basin and as a result the sediment is not wet enough for long enough to support hydrophytic vegetation.

SOIL

Sampling Point: 1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture[3]	Remarks
0-2	7.5YR 4/4	100	none				Sand	
2-4	10YR 4/4	100	none				Sandy Loam	
4-12	7.5YR 4/4	100	none				Sand	
12+	10YR 4/4	100	none				Sandy Loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.
[3]Soil Textures: Clay, Silty Clay, Sandy Clay, Loam, Sandy Clay Loam, Sandy Loam, Clay Loam, Silty Clay Loam, Silt Loam, Silt, Loamy Sand, Sand.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5) (**LRR C**)
- ☐ 1 cm Muck (A9) (**LRR D**)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[4]:

- ☐ 1 cm Muck (A9) (**LRR C**)
- ☐ 2 cm Muck (A10) (**LRR B**)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[4]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: None

Depth (inches):

Hydric Soil Present? Yes ○ **No** ◉

Remarks: Layers created in detention basin by storm events depositing material eroding from canyon over the last 11 to 12 years. Plant material was detected in the layers in various states of decomposition presumably a result of the status when washed down the creek and how long it has been in the profile but did not form a layer to trigger A5.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1) (**Nonriverine**)
- ☐ Sediment Deposits (B2) (**Nonriverine**)
- ☐ Drift Deposits (B3) (**Nonriverine**)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Plowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1) (**Riverine**)
- ☐ Sediment Deposits (B2) (**Riverine**)
- ☐ Drift Deposits (B3) (**Riverine**)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ○ No ◉ Depth (inches):

Water Table Present? Yes ○ No ◉ Depth (inches):

Saturation Present? (includes capillary fringe) Yes ○ No ◉ Depth (inches):

Wetland Hydrology Present? Yes ○ **No** ◉

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: While inundation occurred from between construction and filling of the detention basin, inundation is no longer possible because of the filling and the water being able to escape through the riprap at the western end of the basin.

Arid West Ephemeral and Intermittent Streams OHWM Datasheet

Project: Maple Canyon Rest. Phase 1 **Project Number:** T1805-02 **Stream:** Drainage 1 **Investigator(s):** DL BVA	**Date:** 1/4/19 **Time:** 10:00 - 15:00 **Town:** San Diego **State:** CA **Photo begin file#:** **Photo end file#:**
Y ☒ / N ☐ Do normal circumstances exist on the site?	**Location Details:** Upper Maple Cyn.
Y ☐ / N ☐ Is the site significantly disturbed?	**Projection:** **Datum:** **Coordinates:**

Potential anthropogenic influences on the channel system:
Drainage from surrounding streets has increased flows and erosion in canyon

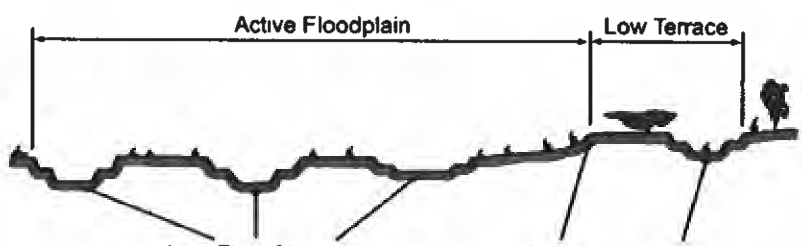
Brief site description: Isolated canyon within Banker's Hill community into which storm drains from surrounding neighborhood drain. Slopes mainly NNG, Eucalyptus, and exotics

Checklist of resources (if available):

- ☒ Aerial photography
  Dates:
- ☒ Topographic maps
- ☒ Geologic maps
- ☒ Vegetation maps
- ☒ Soils maps
- ☐ Rainfall/precipitation maps
- ☒ Existing delineation(s) for site
- ☒ Global positioning system (GPS)
- ☐ Other studies

- ☐ Stream gage data
  Gage number:
  Period of record:
  - ☐ History of recent effective discharges
  - ☐ Results of flood frequency analysis
  - ☐ Most recent shift-adjusted rating
  - ☐ Gage heights for 2-, 5-, 10-, and 25-year events and the most recent event exceeding a 5-year event

Hydrogeomorphic Floodplain Units

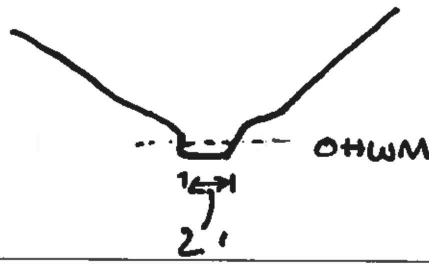


Procedure for identifying and characterizing the floodplain units to assist in identifying the OHWM:

1. Walk the channel and floodplain within the study area to get an impression of the geomorphology and vegetation present at the site.
2. Select a representative cross section across the channel. Draw the cross section and label the floodplain units.
3. Determine a point on the cross section that is characteristic of one of the hydrogeomorphic floodplain units.
   a) Record the floodplain unit and GPS position.
   b) Describe the sediment texture (using the Wentworth class size) and the vegetation characteristics of the floodplain unit.
   c) Identify any indicators present at the location.
4. Repeat for other points in different hydrogeomorphic floodplain units across the cross section.
5. Identify the OHWM and record the indicators. Record the OHWM position via:
   - ☐ Mapping on aerial photograph
   - ☐ Digitized on computer
   - ☐ GPS
   - ☐ Other:

Project ID: T1805-02 **Cross section ID:** #1 **Date:** 1/4/19. **Time:** 14:50.

Cross section drawing:



OHWM

GPS point: ____________________

Indicators:

- [ ] Change in average sediment texture
- [ ] Change in vegetation species
- [ ] Change in vegetation cover
- [x] Break in bank slope
- [ ] Other: ____________
- [ ] Other: ____________

Comments: upper portion of drainage draining upper canyon with one storm drain input. Channel 2-3' wide w/ minimal erosion of banks. Some sorting of material. OHWM just above bed of channel.

Floodplain unit: [x] Low-Flow Channel [ ] Active Floodplain [ ] Low Terrace

GPS point: ____________________

Characteristics of the floodplain unit:

Average sediment texture: Pebble

Total veg cover: 0 % Tree: ____ % Shrub: ____ % Herb: ____ %

Community successional stage:

- [x] NA
- [ ] Early (herbaceous & seedlings)
- [ ] Mid (herbaceous, shrubs, saplings)
- [ ] Late (herbaceous, shrubs, mature trees)

Indicators:

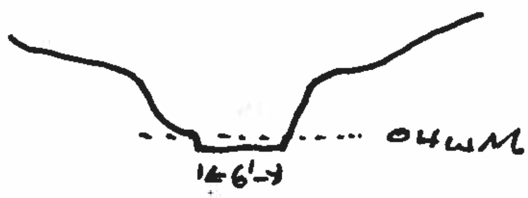
- [ ] Mudcracks
- [ ] Ripples
- [x] Drift and/or debris
- [x] Presence of bed and bank
- [ ] Benches
- [ ] Soil development
- [ ] Surface relief
- [ ] Other: ____________
- [ ] Other: ____________
- [ ] Other: ____________

Comments:

Material in channel a mixture of cobble, pebble, granule, sand.

Project ID: T1805-02 **Cross section ID:** 2 **Date:** 1/4/19 **Time:** 14.00

Cross section drawing:



OHWM

GPS point: ____________________

Indicators:

- ☐ Change in average sediment texture
- ☐ Change in vegetation species
- ☐ Change in vegetation cover
- ☒ Break in bank slope
- ☐ Other: ____________
- ☐ Other: ____________

Comments: 6' wide WoUS with bank erosion as more water carried by channel. OHWM marked by break in bank on inner side of curves.

Floodplain unit: ☒ Low-Flow Channel ☐ Active Floodplain ☐ Low Terrace

GPS point: ____________________

Characteristics of the floodplain unit:

Average sediment texture: pebble

Total veg cover: 0 % Tree: ___ % Shrub: ___ % Herb: ___ %

Community successional stage:

- ☒ NA
- ☐ Early (herbaceous & seedlings)
- ☐ Mid (herbaceous, shrubs, saplings)
- ☐ Late (herbaceous, shrubs, mature trees)

Indicators:

- ☐ Mudcracks
- ☐ Ripples
- ☐ Drift and/or debris
- ☒ Presence of bed and bank
- ☐ Benches
- ☐ Soil development
- ☐ Surface relief
- ☐ Other: ____________
- ☐ Other: ____________
- ☐ Other: ____________

Comments:

Branches and twigs deposited in channel from recent storms.

Project ID: **Cross section ID:** 3 **Date:** 1/4/19 **Time:** 12:15 ~~[illegible]~~

Cross section drawing:

OHWM

GPS point: ____________

Indicators:

- ☐ Change in average sediment texture
- ☐ Change in vegetation species
- ☐ Change in vegetation cover
- ☒ Break in bank slope
- ☐ Other: ____________
- ☐ Other: ____________

Comments:

OHWM was identified by marks in wall of bank.

Floodplain unit: ☒ Low-Flow Channel ☐ Active Floodplain ☐ Low Terrace

GPS point: ____________

Characteristics of the floodplain unit:

Average sediment texture: pebble

Total veg cover: 0 % Tree: ___ % Shrub: ___ % Herb: ___ %

Community successional stage:

- ☒ NA
- ☐ Early (herbaceous & seedlings)
- ☐ Mid (herbaceous, shrubs, saplings)
- ☐ Late (herbaceous, shrubs, mature trees)

Indicators:

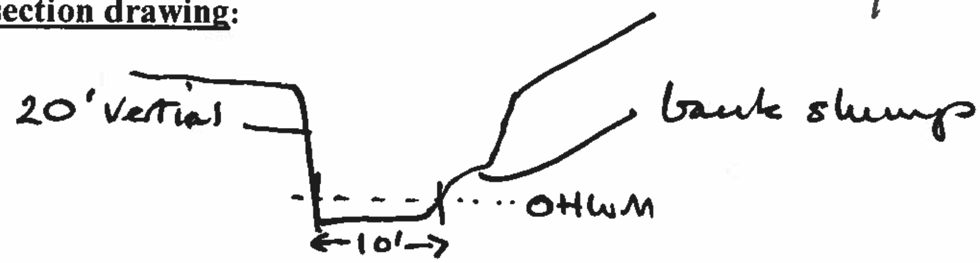
- ☐ Mudcracks
- ☐ Ripples
- ☐ Drift and/or debris
- ☒ Presence of bed and bank
- ☐ Benches
- ☐ Soil development
- ☐ Surface relief
- ☐ Other: ____________
- ☐ Other: ____________
- ☐ Other: ____________

Comments:

Channel precisely defined and constrained within vertical banks.

Project ID: T1805-02 **Cross section ID:** 4 **Date:** 1/4/19 **Time:** 11:20

Cross section drawing:



OHWM

GPS point: ____________________

Indicators:

- [ ] Change in average sediment texture
- [ ] Change in vegetation species
- [ ] Change in vegetation cover
- [x] Break in bank slope
- [ ] Other: ____________
- [ ] Other: ____________

Comments:

OHWM is only 6"-12" above bed but has eroded significant depth into highly erosive soils

Floodplain unit: [x] Low-Flow Channel [ ] Active Floodplain [ ] Low Terrace

GPS point: ____________________

Characteristics of the floodplain unit:

Average sediment texture: pebble

Total veg cover: 0 % Tree: ____ % Shrub: ____ % Herb: ____ %

Community successional stage:

- [x] NA
- [ ] Early (herbaceous & seedlings)
- [ ] Mid (herbaceous, shrubs, saplings)
- [ ] Late (herbaceous, shrubs, mature trees)

Indicators:

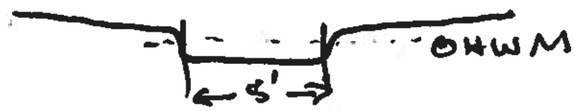
- [ ] Mudcracks
- [ ] Ripples
- [ ] Drift and/or debris
- [x] Presence of bed and bank
- [ ] Benches
- [ ] Soil development
- [ ] Surface relief
- [ ] Other: ____________
- [ ] Other: ____________
- [ ] Other: ____________

Comments:

channel has eroded deep into soil creating a chasm on canyon floor with vertical banks that slump with each rain event.

Project ID: T1805-02 **Cross section ID:** 5 **Date:** 1/4/19 **Time:** 10:00

Cross section drawing:



OHWM

GPS point: ____________________

Indicators:

- [ ] Change in average sediment texture
- [X] Change in vegetation species
- [ ] Change in vegetation cover
- [X] Break in bank slope
- [ ] Other: ____________
- [ ] Other: ____________

Comments:

OHWM ID by extent of bed and presence of grass on bank

Floodplain unit: [X] Low-Flow Channel [ ] Active Floodplain [ ] Low Terrace

GPS point: ____________________

Characteristics of the floodplain unit:

Average sediment texture: Granule
Total veg cover: 0 % Tree: ____ % Shrub: ____ % Herb: ____ %
Community successional stage:

- [X] NA
- [ ] Early (herbaceous & seedlings)
- [ ] Mid (herbaceous, shrubs, saplings)
- [ ] Late (herbaceous, shrubs, mature trees)

Indicators:

- [ ] Mudcracks
- [ ] Ripples
- [ ] Drift and/or debris
- [X] Presence of bed and bank
- [ ] Benches
- [ ] Soil development
- [ ] Surface relief
- [ ] Other: ____________
- [ ] Other: ____________
- [ ] Other: ____________

Comments:

As channel approaches detention basin flow has deposited fine material