FINAL EL CUERVO DEL SUR WETLAND HABITAT MITIGATION AND MONITORING PLAN

Prepared for

City of San Diego
Transportation & Storm Water Department
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URS Project No. 27679051

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Cal-IPC	California Invasive Plant Council
CCC	California Coastal Commission
CDFW	California Department of Fish and Wildlife
CDP	Coastal Development Permit
CEQA	California Environmental Quality Act
City	City of San Diego Transportation & Storm Water Department
CRPR	California Rare Plant Rank
EIR	Environmental Impact Report
ESA	Environmentally Sensitive Area
GPS	Global positioning system
HU	Hydrologic Unit
MHPA	Multi-Habitat Planning Area
MMP	Master Storm Water System Maintenance Program
MSCP	Multiple Species Conservation Program
Plan	Habitat Mitigation and Monitoring Plan
PLS	pure live seed
Preserve	Los Peñasquitos Canyon Preserve
RWQCB	Regional Water Quality Control Board
Site	El Cuervo del Sur Mitigation Site
USACE	United States Army Corps of Engineers

SECTION 1 INTRODUCTION

This Habitat Mitigation and Monitoring Plan (Plan) provides direction for implementing a program to restore native habitats to offset impacts resulting from channel maintenance activities associated with the City of San Diego Transportation & Storm Water Department's (City) Master Storm Water System Maintenance Program (Master Maintenance Program or MMP [Helix 2012]). The MMP outlines maintenance procedures that periodically clear out City storm water facilities to allow them to effectively convey storm water. During this maintenance process, sediment and vegetation is removed, including wetland vegetation. The removal of wetland vegetation requires mitigation for impacts to United States Army Corps of Engineers (USACE) jurisdictional wetlands under Section 404 of the federal Clean Water Act, California Department of Fish and Wildlife (CDFW) riparian habitat under Section 1605 of the California Fish and Wildlife Code, and areas considered wetlands by the Regional Water Quality Control Board (RWQCB), City (Helix 2011), and California Coastal Commission (CCC) through the Local Coastal Program and Coastal Development Permit (CDP).

This Plan includes (1) a description of maintenance impacts, (2) a description of the El Cuervo del Sur mitigation site (Site), (3) a plan to create herbaceous wetland, riparian scrub, and riparian transitional habitat within the Site at a 1:1 mitigation ratio relative to impacts to achieve "no net loss" of wetland function, and (4) a description of the 5-year maintenance and monitoring period. The mitigation concept involves grading the Site to varying depths to create conditions suitable for the establishment of the target habitat community. A comprehensive maintenance and monitoring plan is also included within this plan in addition to performance standards by which the success of the restoration effort will be assessed. This plan has been developed to be consistent with the Conceptual Mitigation Plan contained in the Master Maintenance Program Final Environmental Impact Report (EIR, City of San Diego 2011). Vegetation communities throughout the plan are classified according to Holland (1986).

1.1 PROJECT LOCATIONS AND SERVICE AREA

This Plan specifically addresses mitigation for impacts proposed within the Peñasquitos Hydrologic Unit (HU); this is the service area proposed for the mitigation site. Specific impacts proposed for mitigation within this site include those resulting from maintenance within the Soledad Creek, Sorrento Creek, Los Peñasquitos Creek, Flintkote channels, Tripp and Industrial channels, and the Mission Bay High School (and Pacific Beach Drive/Olney Street) Channels (Figure 1). All required mitigation for these maintenance impacts will occur within the coastal zone in Los Peñasquitos Canyon Preserve (Preserve) as these impacts occur within the coastal zone. This plan presents the conceptual design for wetland establishment (creation), one component of the anticipated required mitigation. A separate enhancement plan has been prepared (URS 2015) addressing remaining anticipated mitigation requirements.

More details regarding the site and service area selection as well as the watershed approach are described in Section 2.2 of this plan.

1.1.1 Sorrento Valley Area Channel Maintenance

Emergency maintenance was performed in 2010/2011 in the Sorrento Valley Area (Figure 2A). Maintenance is proposed to occur in the same geographic footprint in winter of 2015. Mitigation

associated with the creation of the majority of the facility was implemented several years ago. The emergency flood control channel maintenance work as well as the proposed work in Sorrento Valley extends past this previously mitigated work area in two locations: the concrete-lined portion of Soledad Creek and the concrete-lined Flintkote channel. The vegetated portion of these channels consists of sparse, low-growing freshwater marsh species, which have established on accumulated sediment.

1.1.2 Mission Bay High School Channel Maintenance

The currently proposed flood control channel maintenance work at Mission Bay High School includes a concrete-lined portion of a channel adjacent to Mission Bay High School as well as a portion of the channel at Pacific Beach Drive and Olney Street, consisting of concrete-lined and earthen bottom portions (Figure 2B).

1.1.3 Tripp and Industrial Channel Maintenance

Emergency channel maintenance was performed on channels adjacent to Tripp and Industrial Courts in 2010 (Figure 2C). The maintenance work at both channels involved the removal of trash/debris, vegetation, and sediment within the concrete-lined channels. The Tripp Court channel runs upstream from several outfalls from Interstate-5 towards two 57-inch diameter culverts that run under Sorrento Valley Road (City 2010b). The Industrial Court channel runs upstream from an outfall from Interstate-5 toward a double-box culvert under Sorrento Valley Road (City 2010a).

1.2 MAINTENANCE IMPACTS AND PROPOSED MITIGATION

1.2.1 Sorrento Valley Area Channel Maintenance

Dredging of channels in Sorrento Valley occurred as part of Emergency work conducted in 2010/2011 and is currently anticipated to occur within Flintkote and the concrete-lined portions of Soledad Creek in the winter of 2015. Portions of the 2010/2011 emergency maintenance impacts were within the same geographic footprint as permitted in the past, specifically the earthen portions of Soledad Creek. Mitigation for these impacts was implemented successfully as required in the original permits. No new mitigation is proposed. The City implemented 12.07 acres of compensatory habitat mitigation in conformance with regulatory permits for flood control maintenance of Sorrento Creek, Los Peñasquitos Creek, and Soledad Creek and minor wetland impacts from implementation of the El Cuervo Wetland Revegetation Mitigation Project and the Famosa Slough Off-Site Salt Marsh Mitigation Area.

Impacts to the Flintkote channel and the concrete-lined portions of Soledad Creek will be mitigated using the 2010/2011 impacts as a mitigation baseline. Mitigation for the areas not previously permitted and mitigated is proposed pursuant to the CDP and Master Maintenance Program EIR (City of San Diego 2011) at the ratios shown in Table 1. Proposed mitigation includes a 1:1 wetland creation component. For the emergency channel maintenance that occurred in 2011 (and the repeat impact proposed for 2013 in the same geographic footprint), a total of 1.91 acre of wetland creation and 5.53 acres of wetland enhancement is proposed. There are no impacts to upland habitat that would require mitigation. Table 1 summarizes the mitigation requirements for the Sorrento Valley area channel maintenance work.

Table 1
Proposed Mitigation for Sorrento Valley Maintenance Area (Reaches 3 and 7) Impacts [1]

Habitat (Ratio)	2011 Impact Acreage	2013 Impact Acreage	2013 Impact Linear Feet	Impact Acreage Used to Calculate Mitigation	Mitigation Ratio/Type [2, 3]	Mitigation Required
Freshwater Marsh (4:1)	1.21	0.81	**900**	1.21[4]	1:1 Creation	1.21
					3:1 Enhancement	3.63
Disturbed Wetland (4:1)	0.50	-		0.50	1:1 Creation	0.50
					3:1 Enhancement	1.50
Southern Willow Scrub (3:1)	0.04	-		0.04	1:1 Creation	0.04
					2:1 Enhancement	0.08
Riparian Scrub (3:1)	0.16	-		0.16	1:1 Creation	0.16
					2:1 Enhancement	0.32
Total	1.91	0.81	900	1.91	Creation	1.91
					Enhancement	5.53

[1] Total mitigation acreage is based on the impacts of the first maintenance activity (i.e., the 2010/2011 Emergency Maintenance Impacts). Subsequent maintenance impacts do not require additional mitigation if conducted within the same reach and footprint as the original impacts regardless of any changes in vegetation distributions assuming no new sensitive species have been detected. Mitigation will only be done once for a given geographic area. Therefore, the 2013 impacts are covered by the mitigation being done for the 2011 impacts.
[2] Creation acreage will be fulfilled at the mitigation site outlined in this plan.
[3] Enhancement acreage will be mitigated in accordance with the *Los Peñasquitos Canyon Preserve Conceptual Wetland Enhancement Plan* (URS 2015).
[4] Impact acreage encompasses the 0.69 acre of freshwater marsh impacts that required mitigation by RWQCB (Dudek 2013)

1.2.2 Mission Bay High School Channel Maintenance

Maintenance of the Mission Bay High School and Pacific Beach Drive/Olney Street channels has not been previously mitigated and will require compensatory mitigation (Table 2). The earthen portion of Pacific Beach Drive/Olney Street channel supports freshwater marsh vegetation and these portions would be classified as freshwater marsh pursuant to the City's Land Development Code. Impacts are proposed to be mitigated at 4:1 within the Coastal Zone pursuant to the Master Maintenance Program EIR (City of San Diego 2011), including a minimum 1:1 creation of freshwater marsh within the coastal zone. The unvegetated, earthen portions of the channel would be classified as a streambed/natural flood channel pursuant to the City's Land Development Code and mitigation for these impacts would be required at a 2:1 ratio.

Based on this analysis, a total of 0.34 acre of wetland creation will occur at the El Cuervo del Sur site and 0.96 acre of wetlands creation will occur at the Los Peñasquitos Canyon wetland enhancement site (1.30 acres total). Table 2 shows the impacts and mitigation associated with the Mission Bay High School channel maintenance.

Table 2
Anticipated Compensatory Wetland Mitigation Requirements and Allocation
For Mission Bay High School Area Channel Maintenance

Habitat (Ratio)	Projected Impacts (acres)	Mitigation Ratio/Type [1, 2]	Required Mitigation (acres)
Freshwater marsh (concrete-lined) (4:1)	0.13	1:1 Creation	0.13
		3:1 Enhancement	0.39
Freshwater marsh (earthen-bottom) (4:1)	0.18	1:1 Creation	0.18
		3:1 Enhancement	0.54[3]
Unvegetated Streambed/Natural Flood Channel (2:1)	0.03	1:1 Creation	0.03
		1:1 Enhancement	0.03
Total	0.34[1]	Creation	0.34
		Enhancement	0.96

[1] Creation acreage will be fulfilled at the mitigation site outlined in this plan.
[2] Enhancement acreage will be mitigated in accordance with the *Los Peñasquitos Canyon Preserve Conceptual Wetland Enhancement Plan* (URS 2013).
[3] USACE requires 0.18 acre establishment at the El Cuervo del Sur site and 0.18 acre enhancement at the Los Peñasquitos Canyon Preserve site

1.2.3 Tripp and Industrial Channel Maintenance

Emergency maintenance of the Tripp and Industrial Court channels has not been previously mitigated and impacts to this channel will require compensatory mitigation (Table 3). Emergency maintenance was conducted in 2010. Maintenance activities at the Industrial Court channel consisted of work on approximately 300 feet of a 690-foot long facility. Approximately 20 percent of the maintenance work (50 feet) involved the removal of freshwater marsh vegetation which had established on accumulated sediment on top of the concrete-lined drainage facility. The remainder of the maintenance involved the removal of trash and sediment (City 2010a). Maintenance activities at the Tripp Court channel consisted of work on approximately 900 feet of an 1800-foot long facility. Approximately 20 percent of the maintenance work (400 feet) involved the removal of freshwater marsh vegetation which had established on accumulated sediment on top of the concrete-lined drainage facility. The remainder of the maintenance involved the removal of trash and sediment (2010b).

Mitigation is proposed pursuant to the Master Maintenance Program EIR at a 4:1 ratio for areas of freshwater marsh vegetation, with one component included as 1:1 wetland creation. Based on this analysis, a total of 0.05 acre of wetland creation and 0.15 acre of wetlands creation, restoration, or enhancement is proposed (0.20 acre total). Table 3 summarizes the mitigation requirements for the Tripp and Industrial area channel maintenance work.

Table 3
Anticipated Compensatory Wetland Mitigation Requirements and Allocation for Tripp and Industrial Area Channel Maintenance Impacts

Habitat (Ratio)	Impacts (acres)	Mitigation Ratio/Type [2, 3]	Required Mitigation (acres)
Freshwater marsh (concrete-lined) (4:1)	0.05 [1]	1:1 Creation	0.05
		3:1 Enhancement	0.15
Total	0.05	Creation	0.05
		Enhancement	0.15

[1] Impact numbers for Tripp and Industrial channels were combined. The impact numbers are from the Maintenance Activity Reports for each area dated November 2010 (City 2010a and 2010b). The linear feet of vegetated impacts is estimated at 450 linear feet.

[2] Creation/ acreage will be fulfilled at the mitigation site outlined in this plan.

[3] Enhancement acreage will be mitigated in accordance with the *Los Peñasquitos Canyon Preserve Conceptual Wetland Enhancement Plan* (URS 2015).

1.3 FUNCTIONS AND SERVICES OF AFFECTED AREAS

1.3.1 Sorrento Valley Area Channel Maintenance

Flintkote and Soledad Creeks are mainly unvegetated, but the vegetated portion consists of patches of freshwater marsh of varying quality that has established on accumulated sediment averaging four to six inches in depth and is subject to scour from storm flows on an annual basis (Dudek 2013). This vegetation, especially given its location within an urbanized channel and the temporal nature of its existence, provides low to moderate function and services. The vegetation ranges from poor to good quality (Dudek 2013) and may support nesting and foraging uses for wildlife and provide nutrient transformation. The habitat does not provide flood attenuation or groundwater recharge due to its location within a concrete-lined channel. There is a lack of potential for hydric soil development and the small size and temporal and immature (one to two year old) nature of the vegetated area, substantially limits its function as habitat or as a native vegetation community (Dudek 2012). Despite the low to moderate functions and services of these impacts, they will be mitigated in accordance with the conditions outlined in the CCC's CDP issued for the Master Maintenance Program (CCC 2012) at the ratios described in Section 1.2.1 above.

1.3.2 Mission Bay High School Channel Maintenance

The flood control channels that comprise the Mission Bay High School channel maintenance project have been found to support freshwater marsh and non-native grass species in the past. The small overall area of these channels, combined with their linear configuration and urbanized location limits the function and services of any vegetation that grows here, such that these areas would not qualify as wetlands or non-native grassland, pursuant to the City of San Diego's Land Development Code, Biology Guidelines (Dudek 2012). These channels do not support typical functions and services because the plants here grow on accumulated sediment approximately four to six inches in depth. The vegetation is not large enough in

overall extent (up to only two feet wide in most areas) nor located in an area that can support nesting or foraging by wildlife, nor does it provide opportunity for flood attenuation or groundwater discharge due to its location within a concrete-lined channel.

The Pacific Beach Drive/Olney Street flood control channel supports freshwater marsh and non-native grass species. Freshwater marsh with the earthen bottom section of this channel, although limited in function and services provided, does have the potential to be classified as freshwater marsh pursuant to the City of San Diego's Land Development Code (Dudek 2012) and provides habitat for wildlife, including potential nesting and foraging songbirds and small mammals. Despite the limited functions and services of this channel, impacts will be mitigated in accordance with the conditions outlined in the CDP issued for the Master Maintenance Program (CCC 2012) at the ratios described in Section 1.2.2 above.

1.3.3 Tripp and Industrial Channel Maintenance

The Tripp and Industrial channels are concrete-lined flood control drainages that only support marginal freshwater marsh plant species as sediment accumulates during storm events. The channels are also located within urbanized areas consisting of commercial office complexes, which coupled with the low quality of native vegetation, provide little to no cover for use as a migratory corridor. The sparse and immature vegetation is unable to support nesting or foraging uses for wildlife, provides very limited potential for nutrient transformation, and provides no opportunity for flood attenuation or groundwater recharge due to its location within a concrete-lined channel.

1.4 COMPENSATORY MITIGATION DEFINITIONS

There are agency definitions of restoration and enhancement that are relevant to the discussion of mitigation options. Mitigation is described in this plan using terms and definitions that are contained in the USACE Compensatory Mitigation Rule (2008). The distinctions of mitigation type are important during the assessment phase to better inform the permitting phase of mitigation available to compensate for program impacts to federal jurisdictional waters and wetlands. Each mitigation type has a unique, acknowledged compensatory value for temporary and permanent impacts. However, mitigation projects do not always clearly fit into one category. It becomes incumbent for the consultant and City to highlight those project elements that support the mitigation type that is desired for the project.

No-net loss credit for the establishment (creation) of wetland/riparian habitat is proposed as part of the mitigation plan outlined in this document. The El Cuervo del Sur wetland mitigation area would be considered creation as defined below by the City and establishment as defined by USACE and RWQCB.

1.4.1 City of San Diego

The following list provides the City of San Diego operational definitions of the four types of activities that constitute wetland mitigation under "Environmentally Sensitive Lands" in the *Land Development Manual- Biology Guidelines* dated June 2012:

1. **Wetland creation** is an activity that results in the formation of new wetlands in an upland area. An example is excavation of uplands adjacent to existing wetlands and the establishment of native wetland vegetation.

2. **Wetland restoration** is an activity that re-establishes the habitat functions of a former wetland. An example is the excavation of agricultural fill from historic wetlands and the re-establishment of native wetland vegetation.

3. **Wetland enhancement** is an activity that improves the self-sustaining habitat functions of an existing wetland. An example is removal of exotic species from existing riparian habitat.

4. **Wetland acquisition** may be considered in combination with any of the three mitigation activities above.

The Biology Guidelines further state that:

> *Wetland enhancement and wetland acquisition focus on the preservation or the improvement of existing wetland habitat and function, and do not result in an increase in wetland area; therefore, a net loss of wetland may result. As such, acquisition and/or enhancement of existing wetlands may be considered as partial mitigation only, for any balance of the remaining mitigation requirement after restoration or creation if wetland acreage is provided at a minimum of a 1:1 ratio.*

However, the Biology Guidelines acknowledge that:

> *Wetland mitigation required as part of any federal (404) or state (1601/1603) wetland permit will supersede and will not be in addition to any mitigation identified in the California Environmental Quality Act (CEQA) document for those wetland areas covered under any federal or state wetland permit.*

1.4.2 California Department of Fish and Wildlife

CDFW does not have official definitions of wetland mitigation but has typically followed traditional definitions like those in the City's Biology Guidelines. CDFW has discretion in evaluating the appropriateness of mitigation proposals in light of the project impacts and available mitigation options. CDFW works closely with the USACE when evaluating mitigation options.

1.4.3 U.S. Army Corps of Engineers

The following list provides the USACE operational definitions of the three types of activities that constitute wetland mitigation from *Compensatory Mitigation for Losses of Aquatic Resources* (2008):

1. **Establishment (creation)** - the manipulation of the physical, chemical, or biological characteristics present to develop an aquatic resource that did not previously exist at an upland site. Establishment results in a gain in aquatic resource area and functions.

2. **Restoration** - the manipulation of the physical, chemical, or biological characteristics of a site with the goal of returning natural/historic functions to a former or degraded aquatic resource. For the purpose of tracking net gains in aquatic resource area, restoration is divided into two categories: re-establishment and rehabilitation.

a. **Re-establishment -** the manipulation of the physical, chemical, or biological characteristics of a site with the goal of returning natural/ historic functions to a former aquatic resource. Re-establishment results in rebuilding a former aquatic resource and results in a gain in aquatic resource area and functions.

b. **Rehabilitation -** the manipulation of the physical, chemical, or biological characteristics of a site with the goal of repairing natural/ historic functions to a degraded aquatic resource. Rehabilitation results in a gain in aquatic resource function, but does not result in a gain in aquatic resource area.

3. **Enhancement -** the manipulation of the physical, chemical, or biological characteristics of an aquatic resource to heighten, intensify, or improve a specific aquatic resource function(s). Enhancement results in the gain of selected aquatic resource function(s), but may also lead to a decline in other aquatic resource function(s). Enhancement does not result in a gain in aquatic resource area.

1.4.4 Regional Water Quality Control Board

The following list provides the RWQCB operational definitions of the three types of activities that constitute wetland mitigation:

1. **Re-establishment** - the return of natural/historic functions to a site where vegetated or unvegetated waters of the U.S. and/or State previously existed (e.g., removal of fill material to restore a drainage).
2. **Rehabilitation** - the improvement of the general suite of functions of degraded vegetated or unvegetated waters of the U.S. and/or State (e.g., removal of a heavy infestation or monoculture of exotic plant species from jurisdictional areas and replacing with native species).
3. **Enhancement** - the improvement to one or two functions of existing vegetated or unvegetated waters of the U.S. and/or State (e.g., removal of small patches of exotic plant species from an area containing predominantly natural plant species).

The USACE and RWQCB definitions of rehabilitation and enhancement explicitly distinguish between (1) the removal of a heavy infestation or monoculture of exotic plant species from jurisdictional areas followed by establishing native species and (2) the removal of small patches of exotic plant species from an area containing predominantly natural plant species.

1.5 CURRENT MITIGATION REQUIREMENTS

The proposed mitigation for Mission Bay High School, Tripp and Industrial, and the Sorrento Valley area channel maintenance activities, including the creation of this Plan, follow the conditions of the CDP issued for the MMP (CCC 2012). The total amount of wetland mitigation required as compensation for the Mission Bay High School, Tripp and Industrial, and Sorrento Valley area channel maintenance is 8.94 acres, consisting of 2.30 acres of wetland creation proposed at the El Cuervo del Sur mitigation site addressed by the Plan and 6.64 acres of wetland enhancement proposed at the Los Peñasquitos Canyon mitigation site (URS 2015) (Table 4). It is anticipated that this amount of mitigation will fulfill all compensatory wetland mitigation requirements of federal, state, and local regulatory agencies for impact areas not previously mitigated at the El Cuervo and Famosa Slough Mitigation Sites.

Table 4
Wetland Creation And Enhancement Required For Proposed Impacts Within The Peñasquitos Hydrologic Unit

Location	1:1 Wetland Creation Component (acres) [1]	Wetland Enhancement (acres) [2]	Total Acres
Sorrento Valley Area	1.91	5.53	7.44
Mission Bay High School Area	0.34	0.96	1.30
Tripp and Industrial Area	0.05	0.15	0.20
Total	2.30	6.64	8.94

[1] Creation acreage will be fulfilled at the mitigation site outlined in this plan.

[2] Enhancement acreage will be mitigated in accordance with the *Los Peñasquitos Canyon Preserve Conceptual Wetland Enhancement Plan* (URS 2015).

1.6 ESTIMATED FUTURE IMPACTS AND MITIGATION REQUIREMENTS

As part of the City's Storm Water Programs, it is anticipated that future projects located in environmentally sensitive areas and wetlands would require compensatory mitigation including other channel maintenance activities under the MMP. The mitigation site outlined in this plan is intended to mitigate for all City Storm Water impacts in the watershed until all available credit from the site is exhausted. Phase II of El Cuervo del Sur has been identified as an opportunity to offset future impacts from channel maintenance activities and a separate wetland mitigation plan will be prepared for review and approval.

1.7 RESTORATION GOALS AND OBJECTIVES

The purpose of the project is to provide wetland mitigation for impacts resulting from implementation of the MMP and other City projects. The current Sorrento Valley and Mission Bay High School locations covered by Coastal Development Permit A-6-NOC-11-086 require 2.25 acres of wetland creation. The Tripp and Industrial maintenance is anticipated to be permitted in the near future and is also included in the estimate of mitigation requirements (Table 5). Phase I of El Cuervo del Sur would cover all the current mitigation needs as shown in Table 5. Implementation of Phase II is not a part of this mitigation plan. The goal of the El Cuervo del Sur 2.30-acre wetland creation is to provide 0.18 acre of wetland establishment for the USACE and 2.30 acres of wetland creation for both the CCC and City. The mitigation being provided as part of this plan will also meet the habitat creation/establishment requirements from CDFW and RWQCB for the channel maintenance projects listed above. Wetland creation/establishment provided by this Plan will be obtained through the creation of 1.00 acre of herbaceous wetlands, 0.94 acre of riparian scrub, and 0.36 acre of riparian transitional habitat in Phase 1 of the El Cuervo del Sur wetland mitigation site.

Table 5
Wetland Creation Accounting and Project Use

Location	Acreage
El Cuervo del Sur Mitigation Site Phase I (creation acreage available)	2.30
El Cuervo del Sur Mitigation Site Phase II (creation acreage available)	1.42[1]
Total Creation Acreage Available	3.72
Sorrento Valley Area (creation acreage required)	1.91
Mission Bay High School Area (creation acreage required)	0.34
Trip and Industrial Area (creation acreage required)	0.05
Total Creation Mitigation Used	2.30

[1]Phase II will be implemented at a later date under a subsequent HMMP.

SECTION 2 DESCRIPTION OF PROPOSED MITIGATION SITE

2.1 MITIGATION LOCATION

The Site is located at the western edge of the Preserve, north of Sorrento Valley Boulevard and east of Vista Sorrento Parkway and Interstate 5 (Figure 1). The Site (consisting of two phases – Phase I and Phase II)_is approximately 3.72 acres and is specifically located south of Los Peñasquitos Creek, just east of the confluence of Lopez and Los Peñasquitos Creeks (Figures 3 and 4). The El Cuervo Wetland Revegetation Mitigation site is located immediately adjacent to the northern boundary of the Site. This Plan does not include implementation of Phase II.

2.2 MITIGATION SITE SELECTION AND SUITABILITY

Mitigation site selection considered a watershed approach. The main constraints for the mitigation site selection included ensuring that the mitigation site be located within the coastal zone and within the Peñasquitos HU. URS conducted an initial site search on July 18, 2012 to identify potential wetland mitigation sites within the coastal zone portions of the Peñasquitos HU. The analysis showed that the best mitigation options were located within the Los Peñasquitos Canyon Preserve. The initial effort focused on identifying suitable areas to implement wetland creation on City-owned land within the Preserve (URS 2012b). Subsequent field visits were conducted by URS on August 28 and 29, 2012 to evaluate the constraints and opportunities of the initially identified areas (URS 2012a). Several technical studies were also conducted on the Site in March/April of 2013 to evaluate suitability, constraints, and design. The results of these studies will be briefly summarized in Section 2.4 below. These studies considered factors relevant to the watershed approach such as the identification of degraded aquatic resources, the importance of landscape position and resource type, locational factors (e.g., hydrology, surrounding land use), and the sustainability of aquatic resource functions.

Several factors were analyzed to determine suitability of the Site. These factors include the likelihood that the Site could be successfully restored, ownership, inclusion of the Site within the San Diego Multi-Habitat Planning Area (MHPA), presence of utilities/easements, presence of sensitive habitats or species, depth to groundwater, channel cross-sections, hydrology, potential for cultural resources, potential for hazardous materials, construction access, and amount of grading required. Access to this Site may be gained via the main preserve trail south of the creek. The Site would require minimal grading as it is only one and half feet higher in elevation than the adjacent riparian vegetation in the original El Cuervo Wetland Revegetation Mitigation site. This Site was chosen based on preliminary analysis of the above factors (URS 2012a).

2.3 OWNERSHIP STATUS/WATER RIGHTS

The Site is owned by the City and is also located within the MHPA. To the City's knowledge, no other parties have water rights along these segments of Los Peñasquitos and Lopez Creeks or on the subject property.

2.4 EXISTING CONDITIONS

The Site is bordered by the confluence of Lopez and Los Peñasquitos Creeks to the west, the existing El Cuervo Wetland Revegetation Mitigation site to the north, and non-native grassland to the east and south (Figure 5). Representative photographs are included in Appendix A.

2.4.1 Vegetation

The Site is dominated by non-native grasses and herbs such as annual beard grass (*Polypogon monspeliensis*), bristly ox-tongue (*Helminthotheca echioides*), Bermuda grass (*Cynodon dactylon*), mustard (*Brassica/Hirschfeldia* sp.), and wild teasel (*Dipsacus fullonum*), with native grasses and herbs such as beardless wild rye (*Elymus triticoides*) and western ragweed (*Ambrosia psilostachya*), and some native shrubs such as mulefat (*Baccharis salicifolia*), willows (*Salix* sp.), and coast goldenbush (*Isocoma menziesii*) (Figure 5). More hydrophytic species such as cattail (*Typha* sp.) and rushes (*Juncus* spp.) occur along the border of the adjacent El Cuervo Wetland Revegetation Mitigation site.

2.4.2 Sensitive Habitat and Species

No sensitive wildlife species or suitable habitat was observed onsite and no suitable habitat will be impacted in the implementation of this Plan. Mitigation installation in this location would incorporate measures to avoid impacts to Light-footed Clapper Rail (*Rallus longirostris levipes*) and Least Bell's Vireo (*Vireo bellii pusillus*) which have both been documented in the general vicinity of the Site (Figure 6). A Least Bell's Vireo survey was completed with no observations within the Project Site (Attachment F). No sensitive habitat or plant species were noted within or adjacent to this site; however the presence of San Diego marsh elder (*Iva hayesiana*), a California Rare Plant Rank (CRPR) 2 species, and southwestern spiny rush (*Juncus acutus ssp. leopoldii*), a CRPR 4 species, within Los Peñasquitos Creek suggests that this could be a good location for additional plantings of these sensitive species.

2.4.3 Jurisdictional Delineation

A jurisdictional delineation was performed to determine whether any portion of the proposed mitigation site could be considered a wetland or where existing wetlands were located so that this plan could avoid impacts to jurisdictional resources (URS 2013). Soil pits were dug throughout the Site and each location was assessed for hydric soils, hydrophytic vegetation, and hydrology to determine the presence of jurisdictional features. Jurisdictional wetlands are adjacent to the Site and the design considers wetland avoidance (Figure 5, Appendix B). Small temporary impacts to the margins of adjacent wetlands are anticipated during installation. These minor impacts will be restored in-place onsite.

2.4.4 Hydrology and Soils

Three channel and floodplain cross-sections were taken perpendicular to Los Peñasquitos Creek (Appendix C). A representative cross-section location is shown on Figure 5. The channel cross-sections were tied into the existing topography of the Site. The elevation of water within the existing creek was recorded during the cross-section surveys.

HEC-RAS floodplain modeling was conducted and the resulting estimates of the 2-, 5-, 10- and 25-year storm water flood event were used to determine what level of flood event would inundate the Site before and after installation (Appendix C). The results of the channel cross-section surveys and HEC-RAS analysis are shown for a representative cross-section in Figure 7. Based on the modeling results, the 2-, 5-, and 10-year flood events are presently contained within Los Peñasquitos Creek and the existing riparian zone. The Site is estimated to be inundated with overflow from Los Peñasquitos Creek between the 10-year to 25-year or greater storm events. The grading associated with the proposed mitigation site will not increase water surfaces as the Plan calls for fairly balanced site grading. This should not create any significant changes to the effects of 10-year to 25-year or greater storm events downstream of the mitigation site. The proposed mitigation site is south of the existing original El Cuervo Wetland Revegetation Mitigation site and is not directly adjacent to the existing creek. The location of the mitigation site therefore does not allow a direct manipulation of intervening landforms to create a direct connection to the bankfull channel. Implementation of mitigation will not alter the flood frequencies within the proposed site from the pre-project condition. The capacity of the Site to retain flood waters will be increased in comparison to the current site condition and depth-to-groundwater will be greatly reduced.

Soil series maps are displayed on Figure 5 and show Tujunga sand and Altamont clay in this area (Bowman 1973). The presence of perennial pepperweed (*Lepidium latifolium*), alkali-mallow, annual beard grass, and alkali health (*Frankenia salina*) onsite and along the boundary of the original El Cuervo Wetland mitigation site suggests that soils onsite may be slightly saline or alkaline in places. Soil borings were taken at three locations within the Site (Figure 5). Soil boring location B02 was tied into the channel cross-section and the measured depth to ground water, which represents the winter ground water table, is shown on Figure 7. This information was used to estimate a baseline grade that would create post-mitigation depth to ground water conditions suitable for the establishment of wetland and riparian habitat. The proposed grading will reduce the depth to ground water from approximately 2 to 3 feet currently to just below the estimated winter high water table. Grading to this depth would create seasonal ponding during the winter season that would not persist year-round. Soil boring logs are included in Appendix D.

2.4.5 Cultural

A cultural survey was conducted for the Site and soil disposal areas. No cultural resources were found within the Site; however, environmentally sensitive areas (ESA) were designated adjacent to the Site. The ESAs may be driven through, but not impacted in any other way without the presence and permission of an archeological and Native American monitor. The monitor will also be required during any ground breaking activities onsite. The results of the survey are included in Appendix E.

2.5 EXISTING FUNCTIONS AND SERVICES

Smith et al. (1995) defined wetland functions as "the normal or characteristic activities that take place in wetland ecosystems or simply the things wetlands do". Alternately, functions are the physical, chemical, and biological processes naturally performed by a self-sustaining wetland. The mitigation area is currently considered uplands, therefore, wetland functions (hydrologic, biogeochemical, and biological) for this site are nonexistent.

A variety of elements were considered in determining the existing non-wetland habitat functions of the Site. Key elements considered in this brief qualitative evaluation include structural and species diversity, the dominance of native versus non-native plants, potential wildlife use, plant density, extent of vegetation (e.g., patch sizes), and adjacent land use.

The Site is dominated by non-native vegetation. The few native shrubs and palm trees present provide some habitat for native wildlife, and the open areas may provide foraging habitat for raptors. The overall function of disturbed, non-native grassland is limited by past disturbances, which has resulted in a dominance of non-native plant species, sparse vegetation cover, small vegetation patch size, and little physiognomic structure (structural diversity). The near-complete dominance of non-native vegetation increases the potential benefit of converting this area to native wetland habitat.

The western portions of the Site adjacent to the confluence of Lopez and Los Peñasquitos Creeks is likely to receive some overbank flooding, but no wetlands currently exist on the Site and hydrologic and biogeochemical functions normally associated with wetland and riparian areas are limited to non-existent.

2.6 MITIGATION CONCEPT

The goal of the mitigation conceptual design for this Site is to establish wetlands on a currently non-wetland area. The Site has been broken down into two phases (Figure 8). Phase I will completely cover the current mitigation needs (Table 5) and is addressed in this mitigation plan. Phase II is not proposed at this time but could be implemented later under a subsequent HMMP to cover future mitigation needs. The requirements, specifications, and provisions of this plan apply only to Phase I.

A restoration baseline grade was estimated in the conceptual grading cross-section as shown in Figure 7. Elevations within the proposed mitigation site will vary around this baseline grade to reflect the incorporation of secondary channels, pits, ponds, and hummocks. The design incorporates a mix of herbaceous wetland, riparian scrub, and a riparian transition habitat along hydraulic and hydrologic gradients that would extend away from the central depressional areas up to the Site's boundary with the original El Cuervo mitigation site to the north and south edge of the Site (Figure 8). The overall design (including both Phase I and Phase II) establishes two within-floodplain depressional wetland areas with surrounding riparian habitat (Figure 9). These areas are expected to pond seasonally but ponding would not persist throughout the year. Soils would be inundated or saturated to the surface for most of the year. Within the general gradient of the larger design, the Site would include micro- and macro-topographic features including pits, ponds, and hummocks (Figures 8 and 10). These features will be planted with the appropriate plant palette and are expected to increase habitat interspersion functions. While the plantings may follow the zones shown on Figure 8, natural recruitment and sorting along hydrologic gradients is

expected to result in an element of self-design. For example, the herbaceous wetland would be expected to develop some riparian scrub patches/components and vice versa. Transitions between the wetland, riparian scrub, and riparian transition vegetation will vary from 2:1 to 6:1 side slopes. Excavated material will be spread over proposed soil disposal areas (Figure 8). Soil disposal areas will be planted with upland species. Any excess excavated material may be used by the Park staff for road and other improvements. To prevent the spread of non-native species along roads, soil used for road improvements will be taken from 12 to 18 inches below grade. This soil is deep enough to not contain non-native seed. The top 12 to 18 inches of soil will be placed in soil disposal areas which are already weedy and will be weeded during the maintenance and monitoring period.

The Site will be planted and seeded with a compositionally and structurally diverse native plant palette. Maintenance requirements (Section 5) and monitoring of performance standards (Section 6) will ensure that the Site has a dominance of native vegetation and low non-native species cover. The overall site is expected to have the required cover of native vegetation in Year 5. Final cover and densities will be attained through container plantings, seeding, and natural recruitment. As described above and shown in Figure 9, the Site will be graded to provide conditions favorable for the three habitat types planned for the Site.

2.7 TARGET FUNCTIONS AND SERVICES

The primary objective of the proposed wetland establishment (creation) is to convert disturbed, non-wetland, non-native habitat (e.g., dominated by non-native species) adjacent to the confluence of Lopez and Los Peñasquitos Creeks to highly functional native wetland and riparian habitat in the amount of 2.30 acres in Phase I (and 1.42 acres in Phase II under a separate plan). A wetland delineation will be required for all areas or subareas designated as compensatory mitigation for Corps-permitted impacts. The target hydrologic regime of the wetland creation site is a depressional wetland area that ponds seasonally but has an inundated or saturated soil surface most of the year, fed both by groundwater and overland flow. The target functions of the wetland creation site include the increase and maintenance of hydrologic (e.g., dynamic water storage and energy dissipation), biogeochemical (e.g., nutrient cycling, detention of imported elements and compounds, organic carbon export), and habitat (e.g., characteristic plant community, spatial structure, interspersion and connectivity) functions. The created wetland and riparian habitats are expected to provide water quality and wildlife habitat functions as well. Recreational values will be limited to aesthetics only as the Site will not be accessible by the public, but will be visible from existing public trails.

The topographic complexity incorporated by design into the Site will increase the duration of ponding, improving long-term surface water storage and nutrient removal functions. This topographic variation will facilitate the development of diverse zones of wetland/riparian vegetation contributing to increased habitat interspersion functions. Increased flooding and ponding are expected to contribute to, and increase, biogeochemical (i.e., water quality) functions. Water quality functions and values will include groundwater recharge, nutrient removal and transformation, flood flow retention, and sediment stabilization. In addition to recharging the groundwater table, reduced flow rates will retain water and increase flood storage capacity, facilitate removal of excess sediment loads, and result in increased duration of flooding, which allows aerobic and anaerobic processes in the root zone to remove and/or transform nutrients, reducing nutrient loading to adjacent/downstream waters.

The successful creation of habitat will also increase the amount of wetland vegetation communities in the watershed (i.e., landscape diversity will be increased). The Site will be designed to provide a structurally and compositionally diverse habitat that would support various native plant and animal species, include multi-canopy habitat (all areas combined), and a naturally reproducing riparian ecosystem. New habitat will consist of herbaceous wetland, riparian scrub, and riparian transitional habitat. The riparian plantings are expected to eventually mature to riparian woodland contiguous with that which currently exists in Los Peñasquitos Canyon.

The Site will contribute to an overall increase in the extent of wetland and riparian vegetation along this reach of Los Peñasquitos Creek. This will increase foraging habitat and cover for numerous wildlife species by increasing both the extent of riparian vegetation on the Site (cover) and its connectivity with the mature riparian vegetation adjacent to the Site. Two sensitive species observed in the immediate vicinity of the Site, Light-footed Clapper Rail and Least Bell's Vireo, would directly benefit from the creation of a more continuous riparian corridor and increased wetland vegetation that would provide nesting, foraging, and perching habitat for these species as well as other breeding riparian birds. The Site will also increase habitat for riparian-associated butterflies such as Lorquin's admiral (*Basilarchia lorquini*) and western tiger swallowtail (*Papilio rutulus rutulus*), among others.

To summarize, site-specific goals include:

- Establishment of 2.30 acres of native wetland and riparian habitat in Phase I (and 1.42 acres in Phase II at a later date). Phase I will provide establishment of 1.00 acre of herbaceous wetlands, 0.94 acre of riparian scrub, and 0.36 acre of riparian transitional habitat.
- Establishment of 0.18 acre of Corps-wetlands in Phase I as required based on compensatory mitigation requirements for Corps-permitted impacts
- Wetland and riparian habitat will provide increased hydrologic, biogeochemical, and habitat functions as well as recreational values.

These goals will be achieved by implementation of the following objectives:

- Vegetation types to be established are expected to include herbaceous wetlands, riparian scrub, and riparian transitional habitats maturing to riparian woodland contiguous with current adjacent riparian habitats
- Site grading will allow for increased flooding and ponding within the site, which will contribute to increase hydrologic and water quality functions
- Maintenance of the site will keep it free of invasive exotic species and allow for the establishment of native plant communities that will provide habitat for wildlife.

2.8 MSCP LAND USE CONSISTENCY

The implementation of the mitigation project and subsequent maintenance thereof will be consistent with the San Diego Multiple Species Conservation Program (MSCP) (refer to Table 13 of the Biological Technical Report [Helix 2010]). The project specifically conforms to the MSCP because the Site will be converted from its current disturbed, low habitat quality state, into native habitat that will provide increased and improved hydrologic, biogeochemical, and habitat functions and services as noted in Section 2.7 of this Plan. Specifically, drainage functions will be improved, invasive species will be removed, dry non-native brush will be removed and replaced with native vegetation, and habitat for native flora and fauna will be created. As these improvements are being made to lands within the MHPA, the functions and services created will be in line with associated MSCP land use guidelines, subarea plans, and directives.

SECTION 3 RESPONSIBILITIES

3.1 FINANCIAL RESPONSIBILITY/ASSURANCES

The Responsible Party for implementation of this Plan is the Transportation & Storm Water Department of the City of San Diego. The City will be financially responsible for implementing all mitigation requirements. This mitigation plan, each of the permits acquired for City channel maintenance projects, as well as the public record for the channel maintenance activities all constitute a commitment that the City of San Diego will implement any and all required mitigation.

3.2 PROJECT TEAM

3.2.1 Project Proponent

The City will be responsible for retaining a qualified restoration specialist with over 5 years of experience monitoring wetland/riparian mitigation and native habitat revegetation programs to oversee the entire installation and monitoring portions of the mitigation program in coordination with City staff. The City will be responsible for retaining qualified installation and maintenance contractors with documented successful experience installing and maintaining native habitat revegetation programs.

3.2.2 Restoration Specialist

The City will retain a qualified restoration specialist with over 5 years of experience successfully monitoring the installation of wetland/riparian creation projects. The restoration specialist will have overall responsibility for implementation of this restoration project, and will oversee the work of the installation and maintenance contractors in coordination with City staff. The restoration specialist will also be responsible for qualitative and quantitative monitoring and reporting.

The restoration specialist will oversee site preparation, implementation of erosion control measures, and/or any additional best management practices (e.g., silt fencing) required by the plan specifications and regulatory permit conditions. The restoration specialist will inspect all container plants and reject plants that are dead, rootbound, stunted, pest-infested, diseased, or unacceptable for other reasons. The restoration specialist must approve any seed or plant substitutions prior to application/installation.

Once the installation phase of the mitigation plan is complete, overall coordination with the maintenance contractor will also be the responsibility of the restoration specialist. The restoration specialist will meet with the landscape maintenance contractor prior to the start of work to ensure that the contractor understands the maintenance provisions of the restoration plan, as well as the recommendations for current maintenance procedures. In addition to coordinating with the maintenance contractor, the restoration specialist will make regular qualitative and quantitative monitoring visits to monitor the progress of the Site towards meeting final performance standards and to offer adaptive management solutions as needed. The restoration specialist will use horticultural and botanical monitoring techniques to measure progress and to determine if remedial planting or seeding is necessary. The restoration specialist will outline the progress of the Site and any recommendations for remedial measures in progress memos and an annual monitoring report. The restoration specialist will also coordinate closely

with the landscape maintenance contractor and provide a written checklist of tasks to be performed after each monitoring visit. The restoration specialist will approve the species, number, and layout of the replacement plants before the maintenance contractor installs them.

The restoration specialist will have the authority to redirect construction and maintenance crews in keeping with the goals, objectives, and performance standards of the Plan. The restoration specialist can be an individual or a group of qualified professionals with the following minimum qualifications:

1. A minimum of a Bachelor's degree in biology, ecology, botany, horticulture, or landscape architecture.

2. Five (5) years of experience with restoration projects in southern California.

3. Knowledge of the vegetation associations proposed for the revegetation effort, including species identification, general composition, overstory, understory, and species ecological positions.

4. Practical experience or equivalent study, including plant installation, fertilization, weeding, pruning, irrigation, and pest control.

3.2.3 Installation/Maintenance Contractor(s)

Installation and maintenance of the Site are discreet phases of the overall project that may be done by single or separate contractors. Contractor responsibilities for each phase of the Project are outlined in this section.

3.2.3.1 Installation Contractor

The City will retain the services of a qualified installation contractor with demonstrated experience successfully installing native habitat revegetation projects. The contractor will be responsible for implementing and initially maintaining the mitigation effort. The restoration contractor will be a firm (or firms) holding a valid C-27 Landscape Contracting License from the State of California, a valid Maintenance Gardener Pest Control Business License or Pest Control Business License, and a Qualified Applicator Certificate or Qualified Applicator License, with Category B, that will allow them to perform the required work for this Project. The Contractor will have specific documented experience with the installation and maintenance of restoration projects representative of the habitats included in this Plan. The installation contractor should have examples of completed work that has resulted in successful native plant seeding establishment. All work shall be performed by a trained crew in accordance with the standards and practices related to the trade. The installation contractor shall maintain an experienced full-time supervisor on the project site when planting is in progress. The responsibility of the installation contractor is finished when the restoration specialist and the City project manager concur at the end of the 120-day establishment period that this phase of work is completed per the specifications and requirements of this Plan.

3.2.3.2 Maintenance Contractor

The maintenance contractor will provide routine maintenance of the revegetation during the 5-year maintenance and monitoring period, as directed by the restoration specialist. The 5-year maintenance and monitoring period begins after the 120-day establishment period has been deemed completed by the restoration specialist. The revegetation maintenance contractor can be the same as the installation contractor.

The maintenance contractor will be responsible for maintaining the existing materials installed during the planting/seed installation phase; maintaining the irrigation system; weed removal; plant replacement; pest and disease management; and trash removal. Eventual removal of the irrigation system will also be the responsibility of the maintenance contractor. Installing and maintaining erosion control materials in additional areas (identified by the contractor, restoration specialist, or City project manager) where the need for erosion control may develop during the 5-year maintenance program may also be required. Any problems identified by the restoration specialist in progress memos or other correspondence will be addressed by the maintenance contractor in a timely manner (i.e., within two weeks).

Maintenance of native plants is an important aspect of the overall success of the program. The maintenance contractor will care for the native plants in the Site, including container plants, cuttings, seeded species, and native volunteers. The maintenance of container plants includes maintaining weed-free planting basins until the plants are adequately established (e.g., over three feet high for shrubs), maintaining a proper mulch layer around the plants (when necessary), applying appropriate amounts of irrigation water, and addressing disease or pest problems. This level of plant care will be sufficient to help ensure the success standards are met on schedule. If the Site is not meeting native plant survival and percent cover success criteria, then the maintenance contractor will coordinate with the restoration specialist and City project manager to implement remedial measures which may include supplemental planting, seeding, and/or cutting installation.

3.3 SCHEDULE

Table 6 below includes the proposed schedule for site implementation, the 120-day plant establishment period, and maintenance and monitoring for the duration of the project.

The proposed schedule below is provided as a guideline and may change based on unforeseeable issues that may arise after the submittal of this plan. Site preparation will begin no sooner than September to avoid the avian breeding season. Once site preparation is completed, planting/seeding may begin (October/November). Once installation is complete, the 120-day plant establishment period will begin. The 5-year maintenance and monitoring period will begin when the Site meets the 120-day plant establishment period performance standards.

During the 5-year maintenance and monitoring period, the Site will be visited monthly the first year, every other month during the second year, and quarterly thereafter. Irrigation will be scheduled to be turned off after Year 2, to allow the Site to demonstrate its survival and progress for three consecutive years without supplemental irrigation. Quantitative annual monitoring will occur in April or May to capture the blooming period of a majority of the target species. Annual reports will be due in March after

the year the report is documenting in order to include observations made during the December qualitative monitoring visit.

Table 6
Proposed Project Schedule

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
2014									SP	SP, I	SP, I, S	IL, M
2015	IL, M	IL, M	E, L, M	L, M	L, M	L, M	L, M	L, M	L, M	L, M	L, M	L, M
2016	RM	L, M	R	L, M		L, M		L, M		L, M		L, M
2017	RM		L, M, R			L, M			L, M			L, M
2018	RM		L, M, R			L, M			L, M			L, M
2019	RM		L, M, R			L, M			L, M			L, M
2020			F									

Notes:

E = End of 120-day plant establishment period and start of 5 year maintenance and monitoring program.

F = Final report and scheduled completion of the mitigation and monitoring period.

I = Installation of container plants, seeding and/or cuttings.

IL = Installation contractor maintenance.

L = Landscape maintenance.

M = Biological/Horticultural Monitoring.

R = Annual report.

RM = Remedial measures (if necessary).

S = Start of 120 plant establishment period.

SP = Site preparation, grading, clearing of non-native vegetation.

SECTION 4 IMPLEMENTATION PLAN

This section addresses the design and implementation of the Plan. The primary mitigation strategy in this plan will involve the minor grading (one to three feet) of the Site to create three riparian plant zones, (Figure 8). The lowest elevations will contain herbaceous wetland species (e.g., cattails, rushes, and sedges), the middle elevations will contain riparian scrub species (e.g., willows, mulefat, cottonwoods), and the highest elevations will include a transitional riparian community of mixed wetland and upland species (e.g., mulefat, willows, coyote brush, and sycamores). Container plants, cuttings, seed mixes, and potentially pole cutting will all be utilized in the implementation of this Plan.

4.1 RATIONALE FOR EXPECTING IMPLEMENTATION SUCCESS

The Site has been disturbed by past land uses such as grazing and agriculture, which has contributed to the current lack of riparian vegetation in the Site. Once graded, the hydrologic conditions of the Site will be suitable for native wetland/riparian species as evidenced by the presence of scattered patches of native wetland/riparian habitat immediately adjacent to the Site.

The Site is expected to succeed because the Site has been designed to create the appropriate hydrological regime to support the plant species specifically chosen for this area. Hydrologic modeling will be conducted prior to grading to ensure enough material will be removed to allow for natural two, five, ten year flood events to flow into various planting zones of the Site. To prevent soil related issues from hindering plant establishment, soil will be tested and amended as needed prior to the installation of planting material. The Site is buffered from developed areas with at least 100 feet of space between the boundaries of the Site and the nearest development per the CDP requirements (Figure 5; CCC 2012). The open space contains native and non-native vegetation within the boundaries of the Preserve. Upon approval of this plan, a landscape architect holding a valid California license will prepare detailed specifications and plan sheets.

4.2 IMPLEMENTATION SCHEDULE

The anticipated installation schedule for this Plan is shown in Table 6. Site preparation is scheduled to begin in September rather than earlier to avoid the bird breeding season. Additionally, planning/seeding is scheduled to occur between October and February to take advantage of the rainy season. The implementation schedule ends with the successful completion of the 120-day plant establishment period at which point the 5-year maintenance and monitoring period will begin.

4.3 SITE PREPARATION

Site preparation will generally consist of grading the existing topography down to three levels to support the planned planting zones. As such, initial weed eradication will not be necessary.

4.3.1 Grading

Topsoil is typically removed prior to grading during the Site preparation stage of mitigation project and then replaced after grading has been completed; however, due to the nearly ubiquitous cover of non-

native grassland species that are currently present at the Site, it is not recommended that any topsoil be salvaged due to the high content of non-native species seed that is likely to be present in the existing topsoil/seed bank. It is recommended that all graded material including topsoil be placed in the onsite soil disposal area (Figure 8)or at an appropriate offsite facility (i.e., landfill).

The Site will be cleared and graded as necessary using standard earth-moving equipment. Grading will remain within the limits of work established by project surveyors and the restoration specialist in the field before grading begins. The surveyors will flag the limits of the work areas prior to grading. As necessary, adjacent native vegetation not intended to be impacted by construction and subsequent restoration activities will be flagged or fenced off during the implementation process by the restoration specialist. This flagging will be installed prior to construction and will remain in place until grading work is completed. Grading of between one and three feet will be required for the various planting zones as depicted in the Conceptual Grading Plan figure (Figure 10). The boundaries between the different planting zones and the adjacent habitat will gradually slope from one zone to another to avoid any erosion issues that may occur by terracing the various zones. Only construction equipment necessary to accomplish restoration tasks will be allowed in the restoration areas once restoration implementation begins. Workers' vehicles will be parked outside the restoration areas and all equipment will be removed from the Site as soon as its task is completed.

4.3.2 Soil Preparation

Depending on the degree of soil compaction, the soil should be lightly tilled or ripped to reduce soil compaction, increase aeration, and help facilitate healthy root growth. Except as described for container planting or if deemed appropriate by the restoration specialist, fertilization will not take place as part of this revegetation plan. Fertilization with nitrogen or phosphorous-based chemical fertilizers has been shown to favor exotic species over native plants in many sites throughout southern California (Grime and Hunt 1975; Grime 1978). Many species native to arid regions have evolved under low nutrient conditions and are adapted to non-fertilized soils.

4.3.3 Erosion Control

The loss of soil or sediment to erosion will be minimized with the use of silt fencing, fiber rolls, jute matting, straw bales, and/or other erosion control measures where necessary (*e.g.*, high velocity flow areas, steep slopes). The need for erosion control is expected to be minimal and may only be necessary on sloped areas and areas that will support water flow.

4.4 IRRIGATION PLAN

A water hook-up location is available just west of the historic adobe and the entrance to the sewer maintenance access road off of Sorrento Valley Road (Figure 3). This source was also used for two previous El Cuervo mitigation sites in the immediate vicinity of the Site. Water meters and backflow preventers were used initially with water brought to the sites via mainlines, which then tied into valves that sent the water to the different zones via smaller surface lines. A similar set up will be used for this Plan. Detailed irrigation plans will be developed as part of the landscape plans and specifications. The installation contractor will ensure that sufficient water for plant establishment is applied to the Site.

An experienced California licensed landscape architect will design an overhead irrigation system for the Site described in this plan. Soil moisture conditions will be monitored following initial irrigation of plantings and supplemental irrigation will be added if necessary. To promote deep root growth, periodic deep water applications (e.g., to a depth of 12 inches or more) are preferred to frequent light water applications, and therefore each valve will run at least weekly for a minimum of 120 minutes per irrigation application to start, but can be adjusted based on observations made in the field. Irrigation is especially important during the summer and fall months (i.e., June through October), but may also be necessary during the winter rainy season if winter rains are below average. The irrigation system will be turned off once the planted wetland/riparian habitats are considered to be self-sustaining, this should occur by the end of Year 2. The maintenance contractor will remove all above-ground irrigation materials from the Site following successful completion of the mitigation.

4.5 NON-NATIVE PLANT REMOVAL

Non-native plant (weed) removal during the implementation phase of the Project will be limited to weed removal immediately prior to planting and during the 120-day plant establishment period. Weed removal will not be necessary prior to grading because the existing vegetation onsite primarily consists of non-native species that are also likely to be contained in the existing topsoil which will be removed.

Undesirable weeds found in the Site will be eradicated prior to planting. Removing competition early in the restoration process helps to ensure more rapid growth and establishment of the target native species.

- All weeds shall be removed prior to planting within the Site. Pulled weeds shall be transported offsite immediately to prevent onsite seed dispersal.
- Weed eradication shall continue during planting and seeding and during the 120-day plant establishment period, as necessary.

4.6 PLANTING PLAN AND SPECIFICATIONS

A mixture of container plantings, cuttings, and seeding will be utilized for this mitigation plan. Plant palettes and seed mixes for herbaceous wetland (Tables 7 and 8) and riparian scrub (Tables 9 and 10) are presented in Tables 7 through 10. Drier areas and margins of the revegetation area will be planted with a riparian transitional palette containing a mixture of mesic riparian and upland species (Tables 11 and 12). Soil disposal areas will be seeded with a plant palette of coastal sage scrub species containing many of the same upland species contained in the riparian transitional seed mix (Table 13).

Native plant care includes maintaining proper soil conditions, removing competing weed species, providing sufficient supplemental water, and identifying any significant disease or pest problems. If herbivores are found to be a significant problem, the restoration specialist may request that container plants in the affected area be caged or similarly protected. Use of rodenticides is not proposed.

4.6.1 Container Plants

All container plants and seed materials should be locally propagated and collected or from coastal areas of San Diego county within 25 miles of the watershed. The restoration specialist will inspect all container

plants and reject plants that are dead, rootbound, stunted, pest-infested, diseased, or unacceptable for other reasons. Although mulefat and willow species are specified with container plants, it would be preferable to establish these species from locally collected cuttings as conditions allow. This should be considered when preparing the construction specification documents.

Container plants will be used to supplement seed mix. The restoration specialist will direct the final placement of container plants in the field. The following container plant specifications will be followed to the extent practicable.

- Container plants shall be provided by a qualified nursery and plants shall be propagated from propagules from coastal San Diego County, or the Project vicinity (within a 10-mile radius) to the extent feasible. Preferably, plants shall be propagated from materials from the immediate Project area. Plants shall be certified to be free of Argentine ants prior to delivery onsite.
- The restoration specialist will confirm all plants are delivered to the Site in a healthy and vigorous condition before they are installed. Larger container sizes are acceptable if approved by the restoration specialist. The restoration specialist will also help direct plant layout before they are installed.

Pits for container-grown plants will be dug twice as deep and twice as wide as the container, and the planting soil must be thoroughly wetted before planting. Depending on the results of soil analyses, soil amendments may be recommended for the container plant pits. After initial installation, a bermed planting basin (two to three feet wide) will be created around each plant to delineate an area to keep weed-free and aid in the retention of moisture.

Table 7
Herbaceous Wetland Container Plant Palette

Species	Common Name	Container Size	Spacing (feet on center)	Density per Acre [1]
Anemopsis californica	yerba mansa	1-gallon	15	194
Carex praegracilis	clustered field sage	1-gallon	15	194
Frankenia salina	alkali heath	1-gallon	20	109
Juncus mexicanus	Mexican rush	1-gallon	15	194
Salicornia virginica	pickleweed	1-gallon	20	109
Scirpus acutus	hardstem bulrush	1-gallon	20	109
Scirpus americanus	Olney's bulrush	1-gallon	20	109
Total				1018

[1] The 1018 plants per acre equal an approximate spacing of 6.5 feet on center.

Table 8
Herbaceous Wetland Seed Mix

Species	Common Name	Bulk Application Rate (lbs/acre)	Purity/ Germination	Pounds of Pure Live Seed (PLS) per Acre
Ambrosia psilostachya	western ragweed	2.0	20/30	0.12
Artemisia douglasiana	Douglas' mugwort	2.0	15/50	0.15
Carex praegracilis	clustered field sage	1.0	60/80	0.75
Carex spissa	San Diego sage	1.0	95/70	1.36
Cressa truxillensis	alkali weed	3.0	10/70	0.42
Eleocharis macrostachya	common spikerush	1.0	90/70	1.29
Juncus mexicanus	Mexican rush	1.0	-	1.0
Mimulus guttatus	seep monkey flower	1.0	10/60	0.06
Pluchea odorata	marsh fleabane	2.0	20/50	0.80
Scirpus acutus	viscid bulrush	1.0	98/60	1.63
Scirpus americanus	Olney's bulrush	1.0	90/60	1.50
Total		16.0		9.08

Table 9
Riparian Scrub Container Plant Palette

Species	Common Name	Container Size	Spacing (feet on center)	Density per Acre [1]
Baccharis salicifolia	mule fat	1-gallon [2]	15	194
Iva hayesiana	San Diego marsh elder	1-gallon	30	48
Juncus acutus ssp. leopoldii	southwestern spiny rush	1-gallon	30	48
Populus fremontii	Fremont cottonwood	5-gallon	40	27
Rosa californica	California rose	1-gallon	50	17
Rubus ursinus	California blackberry	1-gallon	50	17
Salix exigua	sandbar willow	1-gallon [2]	50	17
Salix gooddingii	black willow	1-gallon [2]	20	109
Salix laevigata	red willow	1-gallon [2]	30	48
Salix lasiolepis	arroyo willow	1-gallon [2]	20	109
Total				634

[1] The 634 plants per acre equal an approximate spacing of 8.3 feet on center.

[2] Cuttings should be used instead of container stock if available locally.

Table 10
Riparian Scrub Seed Mix

Species	Common Name	Bulk Application Rate (lbs/acre)	Purity/ Germination	Pounds of Pure Live Seed (PLS) per Acre
Ambrosia psilostachya	western ragweed	1.0	20/30	0.06
Artemisia douglasiana	Douglas' mugwort	2.0	15/50	0.15
Artemisia palmeri	San Diego sagewort	1.0	-	1.0
Elymus triticoides	beardless wild ryegrass	3.0	90/80	2.16
Juncus mexicanus	Mexican rush	1.0	-	1.0
Lotus scoparius	deerweed	1.0	95/80	0.76
Lupinus truncatus	collar lupine	2.0	95/85	1.62
Mimulus guttatus	seep monkey flower	1.0	10/60	0.06
Muhlenbergia rigens	deergrass	3.0	80/70	1.68
Oenothera elata hookerii	evening primrose	1.0	98/80	0.78
Total		16.0		9.27

Table 11
Riparian Transitional Container Plant Palette

Species	Common Name	Container Size	Spacing (feet on center)	Density per Acre [1]
Baccharis salicifolia	mule fat	1-gallon [2]	15	194
Heteromeles arbutifolia	toyon	1-gallon	50	17
Platanus racemosa	western sycamore	5-gallon	100	4
Populus fremontii	Fremont cottonwood	5-gallon	40	27
Quercus agrifolia	coast live oak	5-gallon	100	4
Rubus ursinus	California blackberry	1-gallon	50	17
Rosa californica	California rose	1-gallon	50	17
Salix laevigata	red willow	1-gallon [2]	30	48
Salix lasiolepis	arroyo willow	1-gallon [2]	20	109
Sambucus mexicana	blue elderberry	5-gallon	40	27
Total				464

[1] The 464 plants per acre equal an approximate spacing of 9.7 feet on center.

[2] Cuttings should be used instead of container stock if available locally.

Table 12
Riparian Transitional Seed Mix

Species	Common Name	Pounds Per Acre	Purity/ Germination	Pounds of Pure Live Seed (PLS) per Acre
Ambrosia psilostachya	western ragweed	1.0	20/30	0.06
Artemisia dracunculus	tarragon	1.5	10/60	0.09
Baccharis pilularis	coyote bush	0.5	2/40	< 0.01
Elymus condesatus	Giant wild rye	3.0	80/80	1.92
Elymus triticoides	beardless wild ryegrass	4.0	90/80	2.88
Isocoma menziesii	coastal goldenbush	0.5	40/30	0.06
Lotus scoparius	deerweed	0.5	95/80	0.38
Lupinus truncatus	collar lupine	2.0	95/85	1.62
Muhlenbergia rigens	deergrass	4.0	80/70	2.24
Total		17.0		19.26

Table 13
Upland Seed Mix

Species	Common Name	Pounds Per Acre	Purity/ Germination	Pounds of Pure Live Seed (PLS) per Acre
Ambrosia psilostachya	western ragweed	1.0	20/30	0.06
Artemisia californica	California sagebrush	4.0	15/60	0.36
Baccharis pilularis	coyote bush	2.0	2/40	0.02
Elymus condesatus	Giant wild rye	2.0	80/80	1.28
Encelia californica	Bush sunflower	4.0	40/60	0.96
Eriogonum fasciculatum	California buckwheat	6.0	50/20	0.60
Isocoma menziesii	coastal goldenbush	1.0	40/30	0.12
Lotus scoparius	deerweed	1.0	95/80	0.76
Lupinus truncatus	collar lupine	2.0	95/85	1.62
Nassella pulchra	Purple needlegrass	3.0	90/80	2.16
Total		26.0		7.94

Note: This seed mix will be used on non- roadway soil disposal areas.

4.6.2 Seeding

Seed shall be purchased from a reputable seed company that has procured seed from local plant populations from coastal San Diego County within 25 miles of the watershed. Seed will be labeled with the species, purity, germination, percent live seed, and quantity of seed in pounds. Prior to application, the restoration specialist will confirm the specified seed has been delivered to the respective sites. All seed will be evenly hand applied or applied using a seed grinder type applicator. To ensure the seed is placed in a favorable setting to promote germination, some hand raking will be performed to work it into the top one inch of soil.

The following seed specifications will be followed to the extent practicable.

14. Seed shall be collected from the Project vicinity (within the same watershed or from coastal San Diego County within 25 miles of the watershed) to the extent feasible or be provided by a qualified commercial seed supplier. Preferably, seed shall be legally collected from the immediate project area. Seed must be delivered in sealed and labeled packaging including the supplier's name, geographic location and collection date, and the tested purity and germination percentage rates. The restoration specialist will inspect the seed prior to its application onsite.
15. Seed application rates are provided in Tables 8, 10, 12, and 13. If the delivered seed differs from specified purity and germination rates, the total pounds per acre rates shall be adjusted accordingly to achieve the specified pounds of pure live seed (PLS).
16. Prior to seeding, the restoration specialist will confirm that the seed bed is properly prepared. Site preparation shall include removal of weed species and weed litter/debris and trash, sufficient decompaction and roughening (i.e., scarification) of the soil surface, and implementation of erosion control materials where necessary, as described above. Seed shall be applied after site preparation, container plant installation (in areas where container plants are proposed), and the installation of any erosion control measures (see above).
17. The specified seed mixes for the riparian areas will be applied as dry-seed mixes. Hydroseed mixes tend to float when exposed to stream flows, transporting the seeds downstream. The riparian transitional mix can be applied as a hydroseed mix and can include natural fiber mulch or bonded fiber matrix in the slurry for erosion control. The seeds will be inspected by the restoration specialist. The restoration specialist will reject any seed that contains weeds or is otherwise not as specified.
18. The Restoration Specialist will review and approve the seed mix before it is ordered. The Restoration specialist will have the discretion to make changes to the seed mix before it is ordered.

Volunteer recruitment is expected and desired in the Site. Seed transport from the high-quality upstream reach and native vegetation adjacent to the proposed planting area should result in the germination of volunteer plants. This is especially true due to the increased water availability in the area as a result of the proposed grading plan.

4.6.3 Cuttings

Willows and mule fat cuttings will be utilized to the extent practicable in lieu of container plants as cuttings are just as likely to thrive and can be sourced for free from existing plants. Source material will be mature shrubs and trees found onsite or adjacent to the Project site. Planting should take place at sites that have an appropriate amount of soil moisture or a water table close to the ground surface, preferably in the fall, or shortly after winter rains have moistened the soils.

Specific stem cutting procedures for small cuttings would include taking cuttings that are as straight as possible and at least 1½ feet long, and ½ to 1-inch in diameter. However, cuttings placed in or near the groundwater table should be sufficiently long enough to reach the water table. A few cuttings can be taken from an individual shrub or tree; however, over-pruning should be avoided. The stems would be cut so that the bottom end is at an angle, to help identify which end to put into the ground. Small cuttings will be stripped of leaves to keep the cutting from drying out, while the tops will be cut flat to allow for gentle hammering if necessary. In some cases, and at the discretion of the restoration specialist and City project manager, larger pole cuttings (8-18 feet in length) can be planted directly into the soil until they reach groundwater to establish immediate large structural elements. Cuttings will be installed so that 50-60 percent of its total length is below grade. Cuttings should be installed right away to avoid desiccation.

4.7 120-DAY PLANT ESTABLISHMENT PERIOD

The 120-day plant establishment period will start after the Site has been seeded and all container plantings/cuttings are installed. The 120-day plant establishment period is intended to provide an observation and guarantee period to ensure that the majority of the seeding/planting installed is showing signs of becoming properly established. During this period, irrigation will be adjusted to maximize the probability of germination. Additionally, many problems that could threaten the overall survivability of this site could likely be detected and fixed during this time. For example, problems with the planned irrigation system that were not apparent during the installation of the system are likely to be identified during the 120-day establishment period. As a part of this period, the contractor who performs the installation is contractually obligated to guarantee their workmanship and perform remedial measures to fix any observed problems as necessary. The restoration specialist will visit the Site at a minimum of once per month during this time frame, and develop a list of action items to be immediately addressed if necessary. The successful completion of this phase of monitoring will set the Site up with a higher probability of long-term success during the following 5-year maintenance and monitoring period and beyond.

The following criteria must be met for the 120-day plant establishment period to be considered successful:

19. All target exotics removed or killed in place
20. Areas free of debris and decompacted
21. No erosion or trash
22. 95% survivorship of container plants

4.8 AS-BUILT DOCUMENTATION

Following the completion of all grading, preparation, and 120 days after installation of the revegetation areas, an As-Built report will be completed by a qualified restoration specialist and submitted to the City, USACE, RWQCB, CCC, CDFW, and City of San Diego Park and Recreation Department Open Space Division in accordance with project permits and agency requests. This report will include photographs and a textual and graphic description of the baseline conditions for the Site including species seeded/planted and densities (CCC 2012). This report also will include GIS data in accordance with the USACE Final Map and Drawing Standards. Deviations from this mitigation plan will also be noted for future reference.

SECTION 5 MAINTENANCE PROGRAM

Maintenance activities planned during the maintenance and monitoring program revolve around the establishment of the plantings to a self-sufficient state. Maintenance activities expected to be necessary during the maintenance program include irrigation system repairs and schedule adjustments, weed removal, dead plant replacement, pest management, soil fertility management, and trash removal.

5.1 MAINTENANCE SCHEDULE

The start of the 5-year maintenance period begins when the installation has been certified as complete by the restoration specialist, after the 120-day plant establishment period. The 5-year maintenance period is intended to allow enough time for the restoration areas to become self-sustaining. The 5-year period may be reduced in areas where the 5th year success standards are achieved sooner as confirmed by resource agency sign-off. Achieving the 5th year success standards would indicate that the site is self-sustaining. The site would immediately be subject to long-term management and maintenance which would continue to protect the site for the remainder of the initial 5-year period and on an ongoing basis thereafter. Maintenance should occur quarterly at a minimum to check on the Site and perform routine maintenance; however, as a guideline, maintenance visits should occur monthly the first year, every other month the second year, and quarterly thereafter (Table 6). The restoration specialist may request additional maintenance visits to attend to any pressing issues observed during monitoring visits.

5.2 NON-NATIVE PLANT CONTROL

Non-native plant (weed) control requires constant diligence by the landscape maintenance contractor. The first two years of project establishment is the crucial period for weed control. Weed species encountered during maintenance visits will be removed immediately. Weeds reported by the restoration specialist in monitoring memos will be removed within two weeks of notification. Because of the critical nature of weed control at the beginning of the project, the landscape maintenance contractor will be required to reseed/replant if weeds are not controlled on a timely basis.

Weeds will be controlled within the Site throughout the duration of the monitoring period. Weeding will be conducted a minimum of four visits during the year, with weeding conducted two to three times in the spring and once in the summer to adequately control weeds when they are most likely to be blooming. The actual schedule should be flexible and be responsive to recruitment timing and infestation patterns. More frequent control measures will be performed as necessary or as recommended by the restoration specialist to keep weeds at manageable levels. The goals of the weed eradication program are to (1) comply with Project and permit conditions; (2) ensure early achievement of habitat creation/enhancement performance standards; and (3) reduce maintenance costs.

Weed control during the maintenance period will involve (1) eradication of resprouting weeds that were initially cut or treated during the mitigation installation phase, and (2) eradication of target weeds that establish during the maintenance and monitoring period. The primary weeds that occur or have the potential to occur onsite are identified along with the proposed methods of control in Table 14. Information on life form, growth habitat, reproduction, and removal/eradication methods are provided from *Invasive Plants of California's Wildlands* (Bossard et al. 2000), the California Invasive Plant

Council (Cal-IPC) website, and the University of California Statewide Integrated Pest Management Project. These sources were reviewed for information on physical, biological [e.g., insects and fungi], and chemical/herbicide control methods. The potential control methods are presented here to help illustrate possible methods. The final methods chosen will be based on recommendations provided by a licensed Pest Control Advisor.

Some weeds may be cut or hand-pulled (e.g., when they are small and the entire root system and/or stolons and rhizomes can be removed), but many species require herbicide application, sometimes in conjunction with cutting, to be eradicated in perpetuity. As required by law, the final recommendations for herbicide use will be made by a licensed Pest Control Advisor and applied under the supervision of a licensed Pest Control Applicator. If weed ecology information indicates herbicide application is necessary to eradicate certain species, then it is recommended that direct application (instead of foliar sprays) and selective herbicides be used. Most weeds should be eradicated before they reach 12" high or set seed. In accordance with some control recommendations, weeds such as giant reed (*Arundo donax*) and eucalyptus (*Eucalyptus* sp.), for example, may have 3' to 6' high resprouts before receiving follow-up eradication treatment. All weeds should be eradicated by hand or herbicide treatment each season before they set seed. All weed debris will be properly disposed of offsite; no parts of any treated non-native species must remain on the Site.

At a minimum, the following weed removal methods should be included in the implementation specifications.

- Weed removal shall be performed predominantly by hand, but herbicides can be utilized under certain conditions to eradicate noxious weeds. An herbicide such as Rodeo® should be acceptable in most situations and shall be applied by a licensed applicator in the appropriate concentration.
- Weed seedlings and sprouts within the creation area shall be continually removed before they attain 12 inches in height or before they produce seed, whichever is first.
- The restoration specialist shall monitor weed eradication and exotic species removal at all times throughout the year.

Weed species are divided between aggressive, invasive exotics, which can out-compete desirable native species if not controlled, and more benign weed species, which tend to fade away as native species become established. Invasive exotics (target exotic species) will be eradicated wherever they occur in or adjacent to (i.e., within 10 feet) the revegetation areas. Invasive exotics include, but are not limited to, fennel (*Foeniculum vulgare*), tamarisk (*Tamarix* spp.), giant reed, pampas grass (*Cortaderia* ssp.), star-thistle (*Centaurea* ssp.), and wild artichoke (*Cynara cardunculus*). Other weeds (non-native species) such as mustard (*Brassica* ssp.), clover (*Melilotus* ssp.), and horseweed (*Conyza* ssp.) need to be removed when they proliferate beyond acceptable levels and/or are inhibiting development of native plants. The restoration specialist will coordinate with the maintenance contractor to identify weed species that must be eradicated. A licensed Pest Control Advisor will supervise the use of herbicide (e.g., for certain target exotic species). Table 14 summarizes potential problem weeds and control methods.

5.3 PLANT REPLACEMENT

The landscape contractor will be responsible for replacing dead or diseased plant material in order to meet success criteria as specified by the restoration specialist. The landscape contractor will also be responsible for planting all replacement container plants, and re-seeding at the specified replacement rates defined by the restoration specialist. The restoration specialist may recommend species substitutions or place replacement plants in different locations from dead plants. The restoration specialist will verify and document dead plant replacement and other revegetation efforts.

5.4 PEST AND DISEASE MANAGEMENT

Young shrubs will be monitored for signs of disease, insect, and/or herbivory damage, and treated as necessary. Badly damaged plants will be pruned to prevent spreading of the disease/pestilence, or replaced in kind if removed. Excessive foraging by herbivorous animals may necessitate protective screening around plants.

An Integrated Pest Management approach will be taken towards pest control, with natural measures and prevention playing major roles in suppressing or reducing pest species populations. Insect plant pests, vertebrate pests, and plant diseases will be monitored by the restoration specialist and landscape maintenance contractor. Severely diseased plants will be removed if directed by the restoration specialist. Species substitutions may be required for plants infected with soil borne pathogens, as an identical species replacement plant is likely to become infected as well. Common chronic plant diseases like anthracnose on western sycamore will generally be ignored unless the infections are severe during the establishment phase. Active pest control measures will be implemented if a pest species poses a competitive threat to native species establishment.

5.5 TRASH REMOVAL

All trash will be removed by the landscape maintenance contractor from the project site during each maintenance visit throughout the maintenance period. Care will be taken that trash removal activities minimize or avoid impacts to plants in the mitigation. Dead limbs and tree fall will be left in place. Weed debris will be removed from the project area and disposed of at an offsite facility approved to handle such waste.

5.6 IRRIGATION SYSTEM MAINTENANCE

The landscape contractor will be responsible for the regular maintenance and repair of all aspects of the irrigation system. Poorly functioning or non-functioning parts will be replaced immediately so as not to endanger the plantings. General system checks will be conducted during each maintenance visit, except during periods when the irrigation system is not in operation as recommended by a qualified restoration specialist.

Table 14
Non-native and Target Exotic Species (Observed or Potential) and Control Methods

Species	Life Form	Growth Habitat	Reproduction	Potential Control Methods
*Arundo (Arundo donax) also known as giant reed**	perennial grass	erect to >20 feet tall (rhizomatous)	roots and rhizomes	spraying or direct treatment of glyphosate to cut stems between late spring and fall; remove all rhizomes
Bassia (Bassia hyssopifolia)	annual chenopod	erect to 1-3 feet tall (rhizomatous)	seed	hand pulled, or application of herbicide such as dicamba, 2, 4-D.
Bermudagrass (Cynodon dactylon)	perennial grass	prostrate, less than 1 foot high	seed and vegetative	Solarizing (place polyethylene plastic on top for 6 to 8 weeks in the summer to cook soil and destroy seeds and plants), or applying post-emergent herbicide to leaves and stems when they are growing vigorously from spring to late summer
Black mustard and Field mustard (Brassica nigra and B. rapa)	annual herbs	erect 1 to 4 feet tall	seed	hand pulling when feasible, or herbicide application before it flowers
Brome grasses and Wild Oats (Bromus ssp. and Avena ssp.)	annual grasses	erect 0.5 to 2 feet tall	seed	hand pulling or herbicide application (glyphosate or other approved) in spring before seed set
*Castor-bean (Ricinus communis)**	perennial shrub	erect, branching 5 to 15 feet tall	seed	hand pulling is effective if the majority of root system is removed, or cut-stump treatment with application of 25% glyphosate
Crystalline iceplant (Mesembryanthemum crystallinum)	succulent perennial	prostate, creeping	vegetative and by seed	hand pulled ensuring all live shoot segments must be removed, or application of glyphosate at concentrations of 2% or higher with surfactant
Curly dock (Rumex crispus)	perennial	erect 2 to 5 feet tall	seed	hand pulling when feasible, or herbicide application
*Eucalyptus (Eucalyptus spp.)**	perennial tree	erect to >20 feet tall	Seed	hand pulling is effective if the majority of root system is removed, or cut-stump treatment with application of 25% glyphosate
Horseweed (Conyza canadensis)	annual herb	erect 2 to 10 feet tall	seed	hand pulling when feasible, or herbicide application
*Mexican fan palm (Washingtonia robusta)**	perennial tree	erect 60 to 100 feet tall	seed	cutting main stem to remove apical meristem.
*Pampas grass (Cortaderia ssp.)**	perennial grass	erect 6 to 8 feet tall	seed (root crown resprouts)	physically remove ensuring the entire crown and top sections of roots are removed, or treatment with a post-emergent application of glyphosate at about a 2% solution with surfactant.

Table 14
Non-native and Target Exotic Species (Observed or Potential) and Control Methods

Species	Life Form	Growth Habitat	Reproduction	Potential Control Methods
Redstem filaree (Erodium cicutarium)	Winter annual or biennial herb	Spreading or erect, generally from a rosette	seed	pre-emergence application of napropamide in early fall or post-emergence applications of glyphosate, 2.4-D, or paraquat late fall through spring
*Sweet fennel (Foeniculum vulgare)**	perennial herb	erect 4 to 10 feet tall	seed or root crown	apply amine and ester formulations of triclopyr or glyphosate in spring
*Tamarisk (Tamnarix spp.)**	perennial shrub/tree	erect to >20 feet tall	seed	hand pulling is effective if the majority of root system is removed, or cut-stump treatment with application of 25% glyphosate
*Tree tobacco (Nicotiana glauca)**	perennial shrub	erect 6 to 15 feet tall	seed	hand pull if the root system can be removed, or cut and apply triclopyr or glyphosate.
*Tocalote (Centaurea melitensis)**	annual herb	erect 2 to 3 feet tall	seed	repeated mowings at 3-week intervals, or spring or fall application of herbicide
White clover and Indian clover (Melilotus albus and M. indicus)	annual herbs	erect 2 to 5 feet tall	seed	hand pulling when feasible, or herbicide application before it flowers
Wild radish (Raphanus sativus)	annual herb	erect 1 to 3 feet tall	seed	hand pulling when feasible, or herbicide application before it flowers

*Target exotic species subject to complete eradication; other non-native species to be controlled

SECTION 6 MONITORING AND PERFORMANCE STANDARDS

6.1 MONITORING AND REPORTING SCHEDULES

The restoration specialist will be responsible for monitoring the restoration site from the installation phase, through the 120-day plant establishment period, to the completion of the 5-year maintenance and monitoring period. Monitoring will be qualitative during the installation and 120-day plant establishment periods, and both qualitative and quantitative through the 5-year maintenance and monitoring period.

6.1.1 Monitoring Schedule

The monitoring year begins on January 1. Qualitative monitoring will occur monthly for the first year, every other month for the second year, and quarterly thereafter. Quarterly visits for qualitative monitoring will occur in March, June, September, and December of each monitoring year (Table 6).

Quantitative monitoring and photo-documentation will occur once annually. Quantitative monitoring will occur in August or September. Annual reports for a given monitoring year will be submitted to the agencies no later than March following the monitoring year.

The monitoring term is anticipated to be five years. A reduction in the 5-year monitoring may be permitted if final performance standards are met in less than five years, as confirmed by the resource agencies. All periods begin at the end of the establishment period for each monitoring phase. The mitigation must be off artificial irrigation for at least three growing seasons prior to sign off and release of short-term responsibilities.

6.1.2 Reporting Schedule

A progress report memo will be completed within a week of each qualitative monitoring visit which will take place monthly the first year, every other month in year two, and quarterly thereafter (Table 6). The annual report will be submitted in March following the monitoring year for which the report is being written. Progress and annual technical reports shall be made available to permitting agencies as necessary.

6.2 PERFORMANCE STANDARDS

Performance standards are provided to guide the Site towards desirable native habitat characteristics within five years. The performance standards are based on the general composition of native habitats, experience on similar projects, reasonable expectations regarding the condition of restored habitats after five years, and substantial conformance with the previously written Conceptual Wetland Restoration Plan (Helix 2011) and CDP conditions (CCC 2012). Attainment of the desired plant composition and cover is expected to result in significant improvement in habitat functions onsite. Yearly performance standards are also provided as milestones to determine whether the mitigation is on an adequate trajectory and whether planting, seeding, cutting installation, and/or other remedial measures are necessary to meet final performance standards. A combination of horticultural and botanical monitoring results will determine whether performance standards are being met and what, if any, remedial measures need to be implemented to meet the final performance standards. Performance standards and potential remedial

measures are presented in Table 15. Additional hydrologic, physical, and biogeochemical standards are described in Section 6.3.4 and Table 16. Based on monitoring results, the restoration specialist and resource agency personnel will determine when performance standards have been achieved during the milestone periods.

The Project will be considered successful at the end of the 5-year monitoring and maintenance period once the following standards have been met:

- Have no less than 75.5 percent absolute cover of native species in the site. This is the weighted average of 80 percent native cover in the herbaceous wetland area, 75 percent cover in the riparian scrub areas, and 60 percent native cover in the riparian transitional area (Helix 2011), weighted by acreage.

- Each planned vegetation community should have at least five species from its respective seeding and/or planting palette represented in the final vegetation community with each of the five species composing at least five percent of the relative vegetation cover of that community

- Have no more than 10 percent total relative cover of non-native species (Section 5.2 and Table 14 list non-native species)

- Have no high risk invasive species (target exotics, defined as being on the California Department of Food and Agriculture noxious weed list)

- Site vegetation is sustained without supplemental irrigation for at least three consecutive growing seasons.

- A wetland delineation will be required for all areas or subareas designated as compensatory mitigation for Corps-permitted impacts and will be required in years 1, 4, and 5. These areas shall meet the definition of a Corps-jurisdictional wetland. Hydrophytic vegetation and wetland hydrology criteria must be met. Hydric soils may not have developed in the 5 year monitoring period and lack of the hydric soil indicators will not prevent agency acceptance and sign-off when wetland hydrology and hydrophytic vegetation criteria are met.

Table 15
Performance Standards and Potential Remedial Measures

Milestone	Performance Standards[1]	Remedial Measures
Initial Exotics Removal and Seed and Plant Installation	• All target perennial exotics removed or killed in place; • Areas free of debris and decompacted as necessary; • No erosion potential or trash; areas designated for planting and seeding are planted and seeded.	• Control remaining perennial exotics • Remove debris and decompact soil • Repair erosion and/or remove trash
120-Day Establishment Period	• All target exotics removed or killed in place; • Areas free of debris and decompacted; • No erosion or trash; • 95% survivorship of container plants.	• Control remaining perennial exotics • Remove debris and decompact soil • Repair erosion and/or remove trash • Dead plants replaced as deemed necessary by the restoration specialist
Year 1	• Control of all target exotics and overall nonnative plant cover under 15%; • Total native cover of 15%; • No significant erosion or trash; • 90% survivorship of container plants.	• Intensify exotics and weed control • Repair erosion and/or remove trash • Dead plants replaced as deemed necessary by the restoration specialist
Year 2	• Control of all target exotics and overall nonnative plant cover under 10%; • Total native cover of 25%; • No significant erosion or trash.	• Intensify exotics and weed control • Repair erosion and/or remove trash • If deemed necessary by the restoration specialist, plant and/or apply seed to aid with the establishment of native cover • If deemed necessary by the restoration specialist, provide or improve irrigation methods;
Year 3	• Control of all target exotics and relative nonnative plant cover of under 10%; • Germination of 50% of seeded species mix where applied; • Total native cover (including volunteers) of 40%; • No significant erosion or trash.	• Turn off irrigation in Year 2 to allow for three irrigation free growing seasons • Other measures are same as above, as necessary
Year 4	• Control of all relative nonnative plant cover not to exceed 10%; • 0% high risk invasives (target exotics); • Total absolute native cover (including volunteers) of 55%; • No significant erosion or trash.	• Irrigation should have been turned off in Year 2 • Other measures are same as above, as necessary

Table 15
Performance Standards and Potential Remedial Measures

Milestone	Performance Standards[1]	Remedial Measures
Year 5	• Control of all absolute nonnative cover not to exceed 10%; • 0% high risk invasives (target exotics); • Total absolute native cover of 75.5% (weighted average of 80 percent native cover in the herbaceous wetland area, 75 percent cover in the riparian scrub areas, and 60 percent native cover in the riparian transitional area); • At least 5 species with at least 5% relative cover each represented from each vegetation community's seeding and/or planting palette; • No erosion or trash; • Site vegetation is sustained without supplemental irrigation for three consecutive growing years.	• Measures are same as above, as necessary

[1] Based on horticultural and botanical monitoring results and photographic documentation, the restoration specialist and resource agency personnel will determine when performance standards have been achieved.

6.3 MONITORING METHODS

The monitoring program will consist of qualitative horticultural monitoring and quantitative botanical monitoring, as described below.

6.3.1 Qualitative Methods

The restoration specialist will perform qualitative horticultural monitoring, which will focus on container plant health and growth, seed germination rates, presence of native and non-native plant species, identification of significant disease or pest problems, and identification of erosion problems. The goal of this type of monitoring is to proactively assess site conditions in order to address items before they become a problem. Another important feature of this monitoring effort is to coordinate with the maintenance contractor to exchange information, provide feedback, and agree on priority maintenance items and potential remedial measures during different stages of the mitigation work to ensure that the restoration project meets the final performance standards.

During the qualitative surveys the restoration specialist will (1) visually estimate composition and overall cover, (2) note (by species and strata) evidence of natural recruitment, and (3) estimate container plant and cutting mortality and survivorship. The restoration specialist will identify potential soil erosion, flood damage, vandalism, weed, and pest problems. The restoration specialist will develop a horticultural monitoring checklist to be filled out during each site inspection. The restoration specialist must retain copies of all checklists and field notes in order to compile memos and annual monitoring reports.

The results of each visit will be summarized in a memo along with plant and irrigation maintenance needs and sent to the maintenance contractor and City project manager within two days of each site visit. Any problems identified by the restoration specialist will be immediately brought to the attention of the maintenance contractor and City, with corrective measures taken within two weeks of the problem being relayed to the maintenance contractor.

6.3.2 Quantitative Methods

The goal of quantitative botanical monitoring is to track the progress of the restoration site toward meeting final success standards, and provide guidance for remedial measures as may be necessary to ensure final success. Quantitative monitoring will be conducted at approximately the same time each year during the late summer of every year, in August or September. Methods will consist of container plant survival counts (where applicable) and 50-meter point-intercept transects, which follow the California Native Plant Society's vegetation sampling protocol (Sawyer and Keeler-Wolf 1995). While the quantitative analyses described below, particularly the statistical and power analyses, are beyond the typical requirements for wetland restoration projects, the City has agreed to implement them for this project in order to meet the recommendations of the CCC.

Nine permanent 50-meter point-intercept transects will be located prior to the start of installation. The end points of each permanent transect will be recorded using global positioning system (GPS) equipment; additionally, each transect will be identified on a site map, staked in the field, and photographed, in order to locate transects should the stakes be lost. The point-intercept method will be used to collect data as follows: at each 0.5 meter, a line will be projected vertically, perpendicular to the transect, and the identity of every species that intersects the line will be recorded.

Species will be recorded in 3 height classes (herb [0-0.5m], shrub [0.5-2m], and tree [>2m]). Native cover for a transect will be calculated as the number of points on that transect at which at least 1 native species was recorded in any height class. Total native cover for the site will be calculated as the average native cover among the 9 transects. Non-native cover and cover within height classes can be calculated in an analogous fashion. Native cover within the 3 target restoration communities can be calculated by the same method, considering only the part of each transect that is within that community, and dividing the number of points at which a native species is present by the total number of points included from the transect. Species observed during the sampling that do not fall along the transect line will be recorded and included on the list of species observed onsite. At least three strata of vegetation (tree, shrub, and herb layers) will be quantified in year five for the Riparian Transitional Community. At least two strata of vegetation (herb and shrub) will be quantified for year five for the Riparian Scrub Community. At least one stratum of vegetation (herb) will be quantified in year five for the Herbaceous Wetland Community.

The purpose of the point-intercept transect sampling is to provide an estimate of native species cover in the restoration site that can be compared to a success standard. Because the estimated native species cover is drawn from a sample of the restoration site, there is error associated with the estimate. Prior to Year 5, this estimate is for the purpose of informing the maintenance process only, and is not interpreted as a formal measure of project success. Only when the project is recommended for acceptance, presumably at the end of Year 5, is strong inference drawn from the comparison of the estimated native species cover to the success standard, and thus only then is statistical rigor required in the interpretation of the result.

Statistical rigor is typically assessed by using a standard parametric test to calculate the level of confidence associated with the comparison. In this case, a one-sample Student's t-test will be used to compare the estimated native species cover to the final success standard of 75.5 percent. Because the alternative hypothesis of that test is that the sample mean (the estimated native species cover) is greater than the final success standard, a 1-tailed test is appropriate.

The native species cover estimate for the restoration site will be compared to the final success standard of 75.5 percent using a 1-tailed, one-sample Student's t-test with Type I error probability (p) compared to alpha of 0.1 (90 percent confidence level). If the estimated native species cover is larger than 75.5 percent and p is less than alpha, the null hypothesis will be rejected and strong inference drawn that native species cover in the restoration site is "significantly" higher than the final success standard. If the estimated native species cover is larger than 75.5 percent but p is larger than alpha, the null hypothesis cannot be rejected with 90 percent confidence; however, the null hypothesis might still be false. In this case, strong inference that the restoration site has achieved native species cover higher than 75.5 percent at a 90 percent confidence level will require a power of at least 0.9 to detect a difference of at least 10 percent. Because power is in part dependent on sample size, it is necessary to predict the parameters of power in order to determine the number of transects that will be required to produce the desired power for the t-test.

The average standard deviation among transects in Year 5, taken from 10 HELIX wetland restoration projects with transect data available, was 10.943 percent. That figure was used as a prediction of standard deviation among transects in Year 5 of this project in order to calculate the number of transects needed to achieve the required power of 0.9 for the t-test. Power from a one-sample, 1-tailed t-test, with sd of 10.943, alpha of 0.1, d of 10, and n of 9 is 0.9051. Thus, the 9 transects established in the restoration site should provide sufficient power to detect a difference of 10 percent at the 90 percent confidence level, should it be necessary to draw strong inference despite failing to reject the null hypothesis. The Restoration Specialist will evaluate and track the standard deviation on a year-to-year basis to determine if additional transects should be added in Year 5 in order to help to achieve the power necessary. Should the power of the t-test in Year 5 be less than 0.9, the number of additional transects needed to achieve the required power (at the observed standard deviation) will be sampled and added to the data set.

Container plant survival counts, if applicable, will be performed once per year in late spring, so any necessary replacement planting can be implemented in the fall and winter. All container plants will be inspected and a list of dead plants will be provided to the maintenance contractor. Based on a determination by the restoration specialist, dead container plants do not need replacement if native plant recruitment (within approximately 2 feet of the dead container plant) is providing equivalent biological value.

6.3.3 Photographic Documentation

Progress of the Site will also be documented with photographs. Each quantitative monitoring visit will include photo documentation of each transect. Photos will be taken from the same vantage point in the same direction at each visit to show a successional trend. All photo documentation points and directions will be mapped and included in the monitoring reports. Photographs from the same viewpoints will be taken each year at the same time of year. GPS data will be collected for the photo points as well.

High-resolution, color or infrared aerial photography could also be used to document mitigation progress. Infrared aerial photographs can help distinguish between nonnative (e.g., pampas grass and acacia) and native species. Aerial photographs can also help track canopy growth and coverage over time. If possible, aerial photographs should be taken before and after exotics removal and then again at the end of the 5-year maintenance and monitoring program.

6.3.4 Functional Assessment

A functional assessment has been developed to meet requirements of the RWQCB Water Quality Certification (WQC) No. R9-2013-0116. For the portion of the wetlands establishment that is required as compensatory mitigation under permits that specifically require a functional assessment, the following methods and performance standards will be implemented prior to mitigation site implementation and immediately prior to mitigation site-off.

For evaluating the functional condition of the wetlands mitigation sites, evaluation criteria will serve as indicators of functional capacity. Scores are assigned to various habitat types within the mitigation site based on the condition of the site relative to the expected condition of a functionally mature site. The categories that will be used to evaluate functional conditions of the wetlands mitigation include:

1. **Habitat - Structural Diversity**
   Patches of willow scrub vegetation must be structurally diverse and contain riparian trees (defined as greater than three inches diameter at breast height [DBH]), saplings (defined as less than three inches DBH), and seedlings, as well as a native shrub understory, herbaceous layer, and/or leaf litter from the riparian canopy. Structural diversity in mule fat scrub habitat shall be slightly less structurally diverse than in willow scrub, with a predominance of shrubs, and potentially, an occasional tree. Freshwater marsh and cismontane alkali marsh shall be much more limited in structural diversity, with occasional shrubs or trees potentially occurring within or adjacent to these habitat types, with the predominant structure as an herbaceous layer. The creation and enhancement of structurally diverse habitats will provide higher value nesting and foraging habitat for wildlife.

2. **Habitat - Coverage and Spatial Diversity**
   Riparian vegetation must be diverse and contain at least three different genera of riparian vegetation. Coverage must be spatially diverse, and include a mosaic of areas dominated by these different species of riparian vegetation. The creation and enhancement of spatially diverse habitat will provide higher value nesting and foraging habitat for wildlife.

3. **Percent of Exotic, Invasive Vegetation**
   This criterion addresses only exotic vegetation in the tree, sapling and shrub layers when used for riverine systems. Exotic grasses or forbs should not be counted in the calculation of percent cover of exotic vegetation. However, in this report, all vegetation, including grasses and forbs, will be evaluated to assess the percent cover of exotic, invasive vegetation in each habitat type.

4. Hydrologic Regime of Riparian Zone

The mitigation sites must contain some evidence of riparian processes such as overbank flow, scour, or deposition (*i.e.*, rack lines). This criterion applies to the entire drainage system, and will only be assessed in willow scrub and mule fat scrub habitats.

5. Micro- and Macro-Topographic Complexity

The mitigation sites must contain some evidence of micro- and macro-topographic complexity such as pits, ponds, hummocks, bars, rills, large boulders, meanders, bars, braiding, secondary channels, backwaters, and terraces. Topographic complexity will provide greater flood flow modification and flood storage functions.

6. Biogeochemical Processes

The mitigation sites must contain woody debris, leaf litter, or detritus. Expansion of riparian areas will increase natural water quality functions such as uptake of nutrients and toxicants and sediment trapping.

Functional Capacity Evaluation Criteria

The evaluation criteria with associated scores for each of the functional categories are described below.

Habitat – Structural Diversity

Score	Evaluation Criteria
0	Site permanently converted to land use which will not be able to support native riparian vegetation, such as housing, agricultural, or concrete channel.
0.2	No existing riparian vegetation (e.g., covered with annual grasses and scrub, bare ground). However, site has the potential for revegetation without extensive structural modification.
0.4	Vegetated areas of the site contain sparse, scattered, patchy or remnant riparian vegetation which is immature and/or lacks structural (vertical) diversity.
0.6	The patches of riparian vegetation on the site contain riparian trees and saplings (i.e., perennial dicots), but contain no, or poorly developed shrub understory
0.8	The patches of riparian vegetation on the site contain riparian trees and saplings (for willow scrub), plus a well-developed native shrub understory.
1.0	The patches on the site are structurally diverse. They contain riparian trees and saplings (for willow scrub), and native seedlings, as well as developed native shrub understory and herbaceous wetlands.

Habitat – Coverage and Spatial Diversity

Score	Evaluation Criteria
0	Site permanently converted to land use which will not be able to support native riparian vegetation, such as housing, agricultural, or concrete channel.

Habitat – Coverage and Spatial Diversity

Score	Evaluation Criteria
0.2	No existing riparian vegetation (e.g., covered with annual grasses and scrub, bare ground). However, site has the potential for revegetation without extensive structural modification.
0.4	Patches of monotypic riparian vegetation covering up to 50 percent of the site, interspersed among grasses or bare ground.
0.6	Patches of diverse riparian vegetation covering up to 30 percent of the site, interspersed among grasses, exotic plants, or bare ground; AND/OR greater than 50 percent of the site covered with monotypic patch(es) of riparian vegetation, interspersed among grasses or bare ground.
0.8	Diverse riparian vegetation covering between 30 percent and 70 percent of the site, e.g., strips or islands of riparian habitat interspersed in open space.
1.0	Diverse riparian vegetation (e.g., at least three different genera of riparian vegetation present) covering between 70 percent and 100 percent of the site, interspersed in open space.

Percent Exotic, Invasive Vegetation

Score	Evaluation Criteria
0	Site is covered with pure stands of exotic vegetation or lacks any riparian vegetation.
0.2	Site is covered by 70 to 99 percent exotic vegetation.
0.4	Site is covered by 40 to 69 percent exotic vegetation.
0.6	Site is covered by 10 to 39 percent exotic vegetation.
0.8	Site is covered by 5 to 9 percent exotic vegetation.
1.0	Site is covered by less than 5 percent exotic vegetation.

Hydrologic Regime of Riparian Zone

Score	Evaluation Criteria
0	No regular supply of water to the site. Site not associated with any water source, surface drainage, impoundment, or groundwater discharge.
0.2	Water supply to the site is solely from artificial irrigation (e.g., sprinklers, drip irrigation). No natural surface drainage, natural impoundment, groundwater discharge or other natural hydrologic regime.
0.5	Site is sustained by natural source of water, but is not associated with a stream, river or other concentrated flow conduit. For example, the site is sustained by groundwater, or urban runoff. There is no evidence of riparian processes, such as overbank flow or scour or deposition.
0.7	Site is within or adjacent to an impoundment on a natural water course which is subject to fluctuations in flow or hydroperiod.

Hydrologic Regime of Riparian Zone

Score	Evaluation Criteria
1.0	Site is within or adjacent to a stream, river or other concentrated flow conduit, which provides the primary source of water to the site. This site contains some evidence of riparian processes such as an overbank flow or scour or deposition.

Micro- and Macro-Topographic Complexity

Score	Evaluation Criteria
0	Channel is contained in a concrete-lined channel, culvert, etc.
0.2	Flood-prone area is characterized by a homogenous, flat earthen surface with little to no micro- and macro-topographic features.
0.5	Flood-prone area contains micro- and/or macro-topographic features such as meanders, bars, braiding, secondary channels, backwaters, terraces, pits, ponds, hummocks, but is predominantly homogenous or flat surfaces.
0.8	Floodplain is not predominantly homogenous but is characterized by micro-topographic features such as pits, ponds, hummocks, bars. However, there are no macro-topographic features such as braiding, secondary channels, backwaters.
1.0	Flood-prone area is characterized by micro- and macro-topographic complexity such as meanders, bars, braiding, secondary channels, backwaters, terraces, pits, ponds, hummocks, etc.

Biogeochemical Processes – Vegetation Roughness and Organic Carbon

Score	Evaluation Criteria
0	Site is contained in a concrete-line channel, culvert, etc., with little to no vegetation or detritus.
0.2	Site can support grasses, forbs, or other herbaceous vegetation and there is woody debris, leaf litter, or detritus present in the channel.
0.4	Site supports at least 25 percent relative cover of grasses, forbs, herbaceous, or riparian vegetation and there is at least 10 percent relative cover of woody debris, leaf litter, or detritus in the channel.
0.6	Site contains 25 percent and 50 percent relative cover of any strata of riparian vegetation and between 10 percent and 40 percent relative cover with woody debris, leaf litter, or detritus.
0.8	Site contains 50 percent and 75 percent relative cover of any strata of riparian vegetation and between 40 percent and 60 percent relative cover with woody debris, leaf litter, or detritus.
1.0	Site contains greater than 75 percent relative cover of any strata of riparian vegetation and greater than 60 percent relative cover with woody debris, leaf litter, or detritus.

Table 16
Function-Based Goals for Success of Wetland Establishment Areas

Evaluation Criteria	Estimated Pre-Project Conditions	Pre-Post Functional Lift
Structural Diversity	0.2	+0.6
Spatial Diversity	0.2	+0.8
Exotic Vegetation	0.2	+0.6
Hydrologic Regime	0.2	+0.8
Topographic Complexity	0.2	+0.3
Biogeochemistry	0.2	+0.4
Average	0.2	+0.6

In summary, the mitigation site will be considered successful when the percent cover criteria, general site characteristics criteria, and average function-based success criteria (i.e., functional lift) have been met at the end of the five-year maintenance and monitoring period.

6.4 REPORTING PROGRAM

The restoration specialist will prepare regular progress reports after each qualitative monitoring visit and an annual monitoring report after the monitoring year (see Table 6 for schedule).

6.4.1 Progress Reports

Progress reports in memo format will be completed after each qualitative monitoring visit. The purpose of this memo is to note the results of horticultural monitoring results such as the identification of plant and irrigation maintenance needs, as well as potential soil erosion, flood damage, vandalism, weeds, and pest problems. This memo will be completed within two days of each visit and sent to the maintenance contractor and City project manager.

6.4.2 Annual Reports

Annual monitoring reports will include horticultural and botanical monitoring results, photographic documentation, a performance evaluation section that contains an assessment of mitigation progress relative to performance standards, and a review of maintenance activities and any remedial measures (e.g., supplemental planting) undertaken during the year. Each report shall include a qualitative and quantitative analysis and compare monitoring results for each monitoring year. Monitoring and maintenance field data shall be included as an addendum to each report. Each report will also contain copies of previous years' reports as appendices.

SECTION 7 COMPLETION OF MITIGATION

7.1 NOTIFICATION OF COMPLETION

The City will notify and coordinate with the appropriate resource agencies to seek concurrence that the final performance standards have been met through the submittal of the final monitoring report and a letter requesting a Notification of Completion. The final report will include analysis of quantitative sampling data that will illustrate that the final performance standards have been met. All temporary structures/fences/irrigation and similar temporary items must be removed from the site prior to filing the notification of completion. The Site may qualify for early approval if final performance standards have been met prior to year five and the mitigation site is accepted as complete by USACE, CDFW, RWQCB, CCC, and City.; however, the Site must be off supplemental irrigation for at least three growing seasons prior to final approval per CDP #A-6-NOC-11-086.

7.2 AGENCY CONFIRMATION

Following the submission of the final annual report and receipt of the Notification of Completion, the resource agencies may visit the Site for confirmation. Once the agencies confirm the completion of the mitigation program in writing, maintenance and monitoring of the Site will cease.

7.3 LONG-TERM MANAGEMENT

The City of San Diego is the owner of the property used as mitigation within the Los Peñasquitos Canyon Preserve, which has an approved Natural Resources Management Plan (NRMP). Additionally the area is part of the MSCP which has development restrictions. In addition the creation site is within the MHPA, the City's preserved lands. Once the Site has met the five-year success criteria and has been signed off by the regulatory agencies, City of San Diego Park and Recreation Staff will review the final annual report and may visit the Site prior to accepting long-term management responsibility.

The City Park and Recreation Department will manage the 2.30-acre creation area once it is accepted by the permitting agencies. The Park and Recreation Department is managing the Los Peñasquitos Canyon Preserve, in accordance with the NRMP, utilizing the funds specified in the City's annual budget. The City Park and Recreation Department would incorporate the 2.30-acre creation area into its overall management of the Los Peñasquitos Canyon Preserve. The specific management activities for the creation area include providing long-term maintenance and monitoring, trash removal, non-native vegetation control, and wildlife habitat monitoring, as described below.

The City will provide long-term protection of the mitigation site through a real estate instrument or other long-term protection mechanism, as approved by USACE. The City of San Diego is obligated to protect and manage the creation site for purposes of native habitat and species conservation in accordance with the MSCP Implementing Agreement (City of San Diego et al. 1997) and the NRMP. Section 10.2 of the Implementing Agreement requires the City to preserve lands within the MHPA. Sections 10.3, 10.4, and 10.5 require the implementation of preserve guidelines, land use adjacency guidelines, and planning policies and design guidelines. These policies have been incorporated into the City's Land Development Code and serve to protect lands within the MHPA from direct and indirect habitat degradation. Section

10.6 of the Implementing Agreement defines the City's responsibilities for Preserve Management and refers to the MSCP Framework Management Plan which is Section 1.5 of the City's Subarea Plan (City of San Diego 1997).

Section 21.3 of the Implementing Agreement states that "notwithstanding the stated term as herein set forth, the Parties agree and recognize that once Take of a Covered Species has occurred and/or their habitat modified within the Subarea, such Take and habitat modification will be permanent. The Parties, therefore, agree that the preservation and maintenance of the habitat provided for under this Agreement shall likewise be permanent and extend beyond the term of this Agreement." Therefore, although the Term of the MSCP is 50 years (1997 – 2047), the preservation of lands within the MHPA, especially in areas where preserved lands are specifically required due to a permanent impact/take, is explicitly permanent.

Additionally, three City Council Resolutions were approved in 1991 and 2007 to provide guidance for the management, protection and preservation of natural resources in the Los Peñasquitos Canyon Preserve.

City Council Resolutions R-O-17698 and R-278894 were approved on October 7 and 22, 1991, acquiring the Los Peñasquitos Canyon Preserve, including portions of Lopez Canyon, for open space purposes. City Council Resolution R-290948 was approved on November 10, 1998 and adopted the Los Peñasquitos Canyon Preserve Master Plan and the Los Peñasquitos Natural Resource Management Plan. These documents provide guidance for the management of the area for the protection and preservation of natural resources.

City Council Resolution R-303253 was approved on December 18, 2007 and formally dedicated 6,600 acres of City-owned land as "dedicated open space." According to the resolution, these lands are "dedicated in perpetuity for park and recreational purposes," and the resolution restricts "public service easements through the dedicated property" to those which "do not significantly interfere with the park and recreational use of the property." Amongst other provisions, this formal dedication commits that the lands "shall not be used for any but park and recreation purposes without a changed use or purposes being authorized by a two-thirds vote of the people."

Once the Site has met the five-year success criteria and has been signed off by the regulatory agencies, City biologists and/or designated staff will review the final annual report and may visit the Site prior to accepting long-term management responsibility. Long-term management of the Site will be consistent with MSCP objectives and the NRMP. Long-term management actions are expected to include removal of transient camps, trash, debris, invasive species, and fencing or signage if applicable as outlined in the MSCP Subarea Plan (City 1997) and the Los Peñasquitos Canyon Preserve Natural Resource Management Plan (City 1998). In addition, the City conducts biological monitoring in coordination with the resource agencies on a regional basis to assess the status of MSCP covered species, including species such as least Bell's vireo that are expected to utilize habitat development by this mitigation project. Regional monitoring may or may not include specific species monitoring on this site, but would include monitoring of species within the Los Peñasquitos Preserve.

The City has established protections for lands within the MHPA, in conformance with the Implementing Agreement, through Section 143.0101 of the City's Land Development Code (Environmentally Sensitive Lands Regulations). This section of the Land Development Code incorporates Sections 1.4.1 and 1.4.2 of

the MSCP Subarea Plan that restricts uses within the MHPA in a similar fashion as a conservation easement or deed restriction. The Land Development Code also incorporates Section 1.4.3 of the MSCP Subarea Plan that restricts land uses adjacent to the MHPA, include establishment of potential adverse drainage conditions, toxic chemical uses, lighting, noise, and invasive species, These restrictions in particular, provide greater site protection and ensure a higher degree of long-term sustainability than typical conservation easements and/or deed restrictions.

Site Access

City biologists, park rangers, and designated maintenance staff shall have access to the site for maintenance and monitoring related activities.

Maintenance and Monitoring Parameters

City biologists will be responsible for directing and/or conducting all long-term monitoring efforts and remedial measures. City biologists and designated maintenance staff will ensure any remedial and management actions are consistent with MSCP and MHPA guidelines and regulations.

Trash

Anthropogenic trash, as well as non-native plant species biomass shall be removed from the site, and disposed of in a legal and appropriate manner. Biomass originating from native plant species shall remain on site for carbon cycling, and is not considered “trash”.

Non-Native Vegetation Control

Non-native plant species, particularly perennial species which have historically shown to be highly invasive, shall be controlled. Control may involve hand pulling prior to seed-set (for species where the entire root mass may be removed), herbicide application, cutting, mechanical removal, or a combination thereof. Any herbicide use shall be conducted following the manufactures recommendations, and applied in a manner compatible with applicable federal, state, and local regulations, consistent with MSCP management guidelines. Biomass from non-native vegetation shall be removed from the site, and disposed of in a legal and appropriate manner. Care should be taken to avoid spreading root, shoot or seed material around the site or in the stream which may provide opportunity for dissemination or additional colonization. No slash shall be stored onsite, or within the floodplain where it is in danger of being washed downstream.

Treatment and/or removal of non-native vegetation with significant structure to provide habitat for special status wildlife should be evaluated for absence/presence prior to engaging the control methods, particularly during the nesting/breeding season (generally March 15 through September 15). All federal, state and local work restrictions for native wildlife habitat shall be followed.

Other Potential Environmental Stressors

Other stressors which have the potential to negatively affect the habitat quality of the site include, but are not limited to: fire, flood, excessive erosion or aggradation, significant streambed migration, or effects from adjacent or upstream land uses.

Should effects from environmental stressors or events be observed, City biologists shall perform an analysis to identify the effects of the stressor(s), and formulate remedial action(s) intended to support dynamic habitat equilibrium and wildlife use of the site. Depending on the nature of the stressor, consultation with additional regulatory agencies and/or specialists may be warranted. Any adaptive management, remedial action or regular management activity performed shall be implemented in accordance with applicable regulatory guidelines.

Wildlife Habitat Monitoring

Ongoing and collaborative biological monitoring between City staff and California Department of Fish and Wildlife (CDFW) and U.S. Fish and Wildlife Service (USFWS) may or may not include specific species monitoring on this site, but may include monitoring of species within the general segment of Los Peñasquitos Creek, as part of the MSCP and MHPA.

Funding

The City's General Fund, Environmental Growth Fund, and Special Funds in the Park and Recreation Department (P&R) long-term accounts provide for maintenance and management of City owned lands in the Los Peñasquitos Canyon Preserve through the budget process with approval from the City Council. Following acceptance of the mitigation site following completion of the five-year maintenance and monitoring program, ongoing management will be provided by the Open Space Division of the P&R. P&R's annual budget for open space in FY 2015 includes approximately $11.2 million for management of approximately 26,000 acres of open space and preserve lands, averaging $430 per acre per year. For further granularity, P&R expenditures in City-owned and managed lands in Los Peñasquitos Canyon, Del Mar Mesa, and Carmel Mountain Preserves totaled $474,741 for FY 15. The approximately 4,500 acres in these three preserves are managed by the same staff and total $106 per acre. This calculation may not include some City-wide MSCP efforts, such as species-specific rare plant monitoring. Using the greater of the two per-acre cost estimates equates to roughly $989.00 for the approximately 2.30-acre El Cuervo Del Sur Phase 1 creation site. Estimated long term maintenance costs represent less than 0.01% of the annual P&R budget for City-wide open space and approximately 0.2% of the FY 15 budget for City-owned and managed lands in Los Peñasquitos Canyon, Del Mar Mesa, and Carmel Mountain Preserves.

Long term management of the site will be conducted in accordance with the Los Peñasquitos Canyon Preserve Natural Resource Management Plan (City 1998), which describes the requirements for preserve maintenance, including maintenance of weeds, closure of trails, and control of public access. Maintenance of the mitigation site will include the existing management functions being conducted by P&R within the Los Peñasquitos Canyon Preserve. The City summarizes the management actions completed each year within their open space areas as part of MSCP Management Actions Reports. In the latest published annual report (City 2013), P&R completed the following Stewardship Management Actions in the Los Peñasquitos Canyon Preserve: park-wide trail monitoring and maintenance (monthly); removal of illegal

encampments; invasive species removal; repair of trail damage; installation of signage; and general weed removal. Long-term management of the mitigation site will include weed maintenance, trash removal, and access control.

Because the mitigation site would be added to the overall management of the open space preserve in Los Peñasquitos Canyon Preserve, and due to the small share of P&R's annual budget that would be allocated to long-term management for this mitigation site, the existing budget and policy framework for Los Peñasquitos Canyon Preserve will adequately cover long-term management requirements of the mitigation site following agency acceptance.

SECTION 8 CONTINGENCY MEASURES AND ADAPTIVE MANAGEMENT

This section describes contingency measures that might be invoked in the event that all, or a portion of the mitigation project, does not meet performance standards in any given year of the 5-year maintenance and monitoring program. If performance standards are not met, maintenance and monitoring obligations will continue until the criteria are met and the resource agencies issue a confirmation of final Project approval.

8.1 INITIATING PROCEDURES

If the yearly performance standards are not met, the City will work with the restoration specialist and the contractor to implement additional measures to help ensure success of the mitigation effort. If final performance standards are not met and the agencies do not accept the wetland establishment/creation as being complete, the restoration specialist, in consultation with the agencies, shall prepare an analysis of the cause(s) of failure and a supplemental mitigation strategy will be created for approval. In the event that wildfire, flood, or other force results in major damage to the site before documentation that the required 5 year monitoring period and fifth year performance standards are met, and the site could not meet performance standards in the post-event condition, then the City would be required to take the necessary contingency measures to fulfill their mitigation obligations unless the regulatory agencies at their discretion agree to sign-off without those remedial measures being taken.

8.1.1 Funding Mechanism

The City is responsible for covering all costs associated with planning, implementation, and monitoring of contingency measures needed if the Site fails to meet its stated performance criteria.

8.2 ALTERNATIVE LOCATIONS FOR CONTINGENCY MITIGATION

Sufficient contingency mitigation areas will be present in areas where mitigation is to occur. If the performance standards of this mitigation site are not being met, the CCC, USACE, CDFW, RWQCB, and City will work together to reach a mutually acceptable alternative solution.

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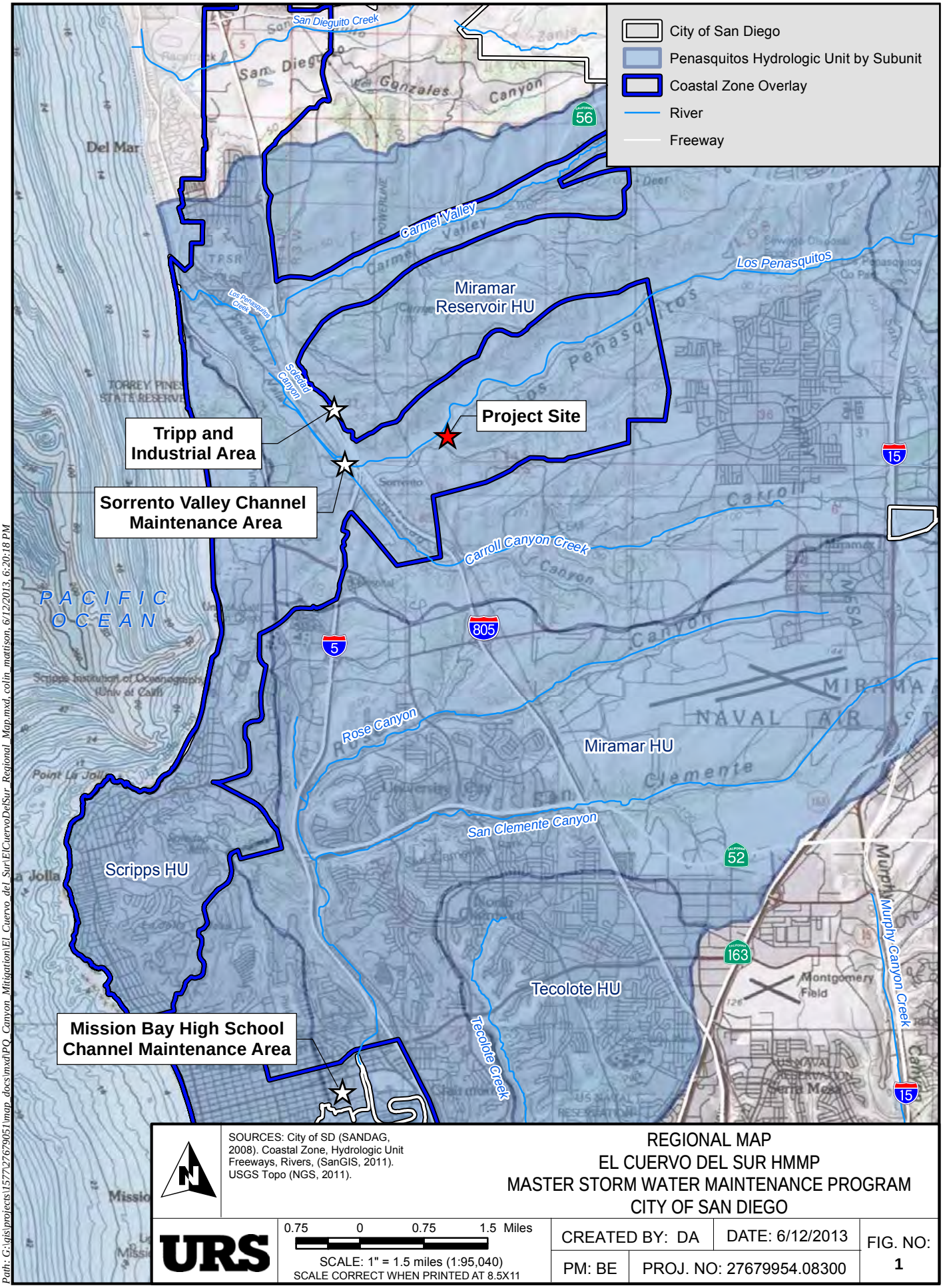

SOURCES: City of SD (SANDAG, 2008). Coastal Zone, Hydrologic Unit Freeways, Rivers, (SanGIS, 2011). USGS Topo (NGS, 2011).

REGIONAL MAP
EL CUERVO DEL SUR HMMP
MASTER STORM WATER MAINTENANCE PROGRAM
CITY OF SAN DIEGO

URS

0.75 0 0.75 1.5 Miles

SCALE: 1" = 1.5 miles (1:95,040)
SCALE CORRECT WHEN PRINTED AT 8.5X11

CREATED BY: DA	DATE: 6/12/2013	FIG. NO: 1
PM: BE	PROJ. NO: 27679954.08300	

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SOURCES: Maintenance Areas (City of San Diego, 2012). Work Areas (URS, 2013). Vegetation (CDFG, ACOE, City of SD, 2010). Roads (SanGIS, 2012). Aerial (SanGIS, 2012).

MAINTENANCE LOCATIONS
SORRENTO VALLEY AREA
EL CUERVO DEL SUR HMMP
CITY OF SAN DIEGO

URS

170 0 170 340 Feet

SCALE: 1" = 340' (1:4,080)

SCALE CORRECT WHEN PRINTED AT 11X17

CREATED BY: PM	DATE: 6/13/2013	FIG. NO: 2A
PM: BE	PROJ. NO: 27679954.08300	

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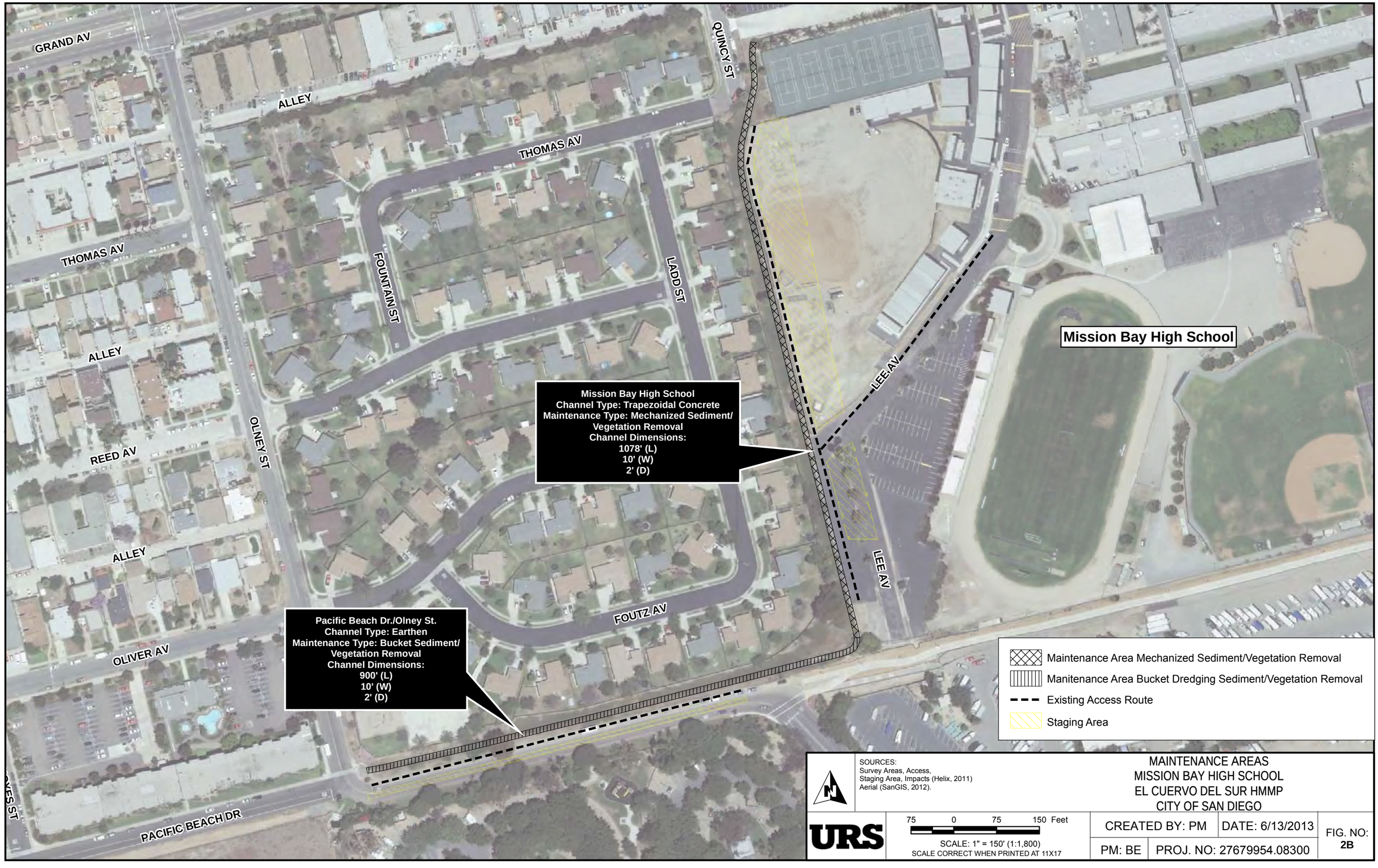

SOURCES:
Survey Areas, Access,
Staging Area, Impacts (Helix, 2011)
Aerial (SanGIS, 2012).

MAINTENANCE AREAS
MISSION BAY HIGH SCHOOL
EL CUERVO DEL SUR HMMP
CITY OF SAN DIEGO

URS

75 0 75 150 Feet

SCALE: 1" = 150' (1:1,800)
SCALE CORRECT WHEN PRINTED AT 11X17

CREATED BY: PM	DATE: 6/13/2013	FIG. NO: 2B
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Channel Maintenance Area
Concrete
Earthen

Habitat

Developed
Freshwater Marsh

SOURCES:
Survey Areas, Access,
Staging Area, Impacts (Helix, 2011)
Aerial (SanGIS, 2012).

MAINTENANCE AREAS
TRIPP AND INDUSTRIAL
EL CUERVO DEL SUR HMMP
CITY OF SAN DIEGO

URS

100 0 100 200 Feet

SCALE: 1" = 200' (1:2,400)
SCALE CORRECT WHEN PRINTED AT 11X17

CREATED BY: PM	DATE: 6/13/2013	FIG. NO: 2C
PM: BE	PROJ. NO: 27679954.08300	

CARMEL MTN RD
SORRENTO VALLEY RD
INDUSTRIAL CT
TRIPP CT
VISTA SORRENTO PY
5
DEV
006a
FWM
DEV
SORRENTO VALLEY RD
FWM
DEV
FWM
DEV
006
SORRENTO VALLEY RD

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SOURCES: Site Boundary (URS, 2013). Roads, Rivers, Coastal Zone (SanGIS, 2011). Aerial Imagery (SanGIS, 2012).

VICINITY MAP
EL CUERVO DEL SUR HMMP
CITY OF SAN DIEGO

URS

500 0 500 1000 Feet

SCALE: 1" = 1,000' (1:12,000)
SCALE CORRECT WHEN PRINTED AT 8.5X11

CREATED BY: DA	DATE: 6/13/2013	FIG. NO: 3
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El Cuervo del Sur Site Boundary

SOURCES: Site Boundary (URS, 2013). Aerial Imagery (SanGIS, 2012).

PROJECT LOCATION
EL CUERVO DEL SUR HMMP
CITY OF SAN DIEGO

URS

45 0 45 90 Feet

SCALE: 1" = 90' (1:1,080)

SCALE CORRECT WHEN PRINTED AT 11X17

CREATED BY: LR	DATE: 5/7/2013	FIG. NO: 4
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El Cuervo del Sur Site Boundary
100-Foot Buffer
El Cuervo Mitigation Site
Jurisdictional Delineation Sample Point
Boring Location
Sewer Manhole
Sewer Main
Topography

Soil Map Layer

AtE, Altamont clay, 15 to 30 percent slopes
AtF, Altamont clay, 30 to 50 percent slopes
SbC, Salinas clay loam, 2 to 9 percent slopes
TuB, Tujunga sand, 0 to 5 percent slopes

Vegetation

Disturbed
Freshwater Marsh
Mulefat Scrub
Non-Native Grassland
Southern Willow Scrub
Jurisdictional Wetland (All Agencies)

El Cuervo Norte Mitigation Site
El Cuervo Wetland Revegetation Mitigation Site
Eucalyptus
JDSP 3
B02
Approximate Cross-Section Location
B01
Palm Trees
JDSP 9
B03
Not Impacted
JDSP 8
TuB
SbC
AtF
AtE

SOURCES: Site Boundary, Buffer, Vegetation, Utility Right of Way, JDSP, Boring (URS, 2013). Water line, Sewer line, Sewer Manholes, Aerial Imagery (SanGIS, 2012). Gas line (PowerMap, 2003). Soil (SSURGO, USDA, 2007). Topo lines (SanGIS, 2009).

EXISTING CONDITIONS
EL CUERVO DEL SUR HMMP
CITY OF SAN DIEGO

URS

45 0 45 90 Feet

SCALE: 1" = 90' (1:1,080)

SCALE CORRECT WHEN PRINTED AT 11X17

CREATED BY: LR	DATE: 5/9/2013	FIG. NO: 5
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2013 Survey Observations

- Least Bell's vireo

Sensitive Species

- Light-footed Clapper Rail
- Coastal California Gnatcatcher
- Least Bell's Vireo
- El Cuervo del Sur Site Boundary
- Coastal Zone Overlay
- Multiple Habitat Planning Area (MHPA)
- El Cuervo Mitigation Site
- City of San Diego Public Utilities Mitigation Sites
- River

Public Land Ownership

- City
- Other Local
- State

El Cuervo Wetland Revegetation Mitigation Project

El Cuervo del Sur

El Cuervo Norte Mitigation Boundary

Los Peñasquitos Creek

SORRENTO VALLEY BL

ROSELLE ST

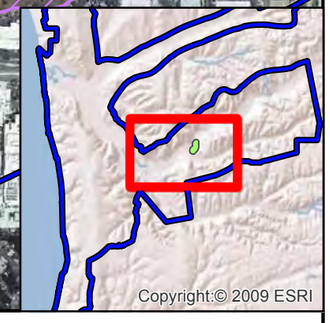
VISTA SORRENTO PY

LUSK BL

SORRENTO VALLEY RD

5

805



Copyright:© 2009 ESRI

SOURCES: Site Boundary (URS, 2013).
Species (CNDDB, CDFW, 2012).
Survey Observations (URS, 2013).SD
Public Utilities Mitigation, MHPA (SanGIS, 2011). Mitigation Sites (City of SD, 2012).
Land Ownership (Sandag, 2010). Roads, Rivers, Coastal Zone (SanGIS, 2011).
Aerial Imagery (SanGIS, 2012).

SENSITIVE SPECIES
EL CUERVO DEL SUR HMMP
CITY OF SAN DIEGO

URS

375 0 375 750 Feet

SCALE: 1" = 750' (1:9,000)
SCALE CORRECT WHEN PRINTED AT 11X17

CREATED BY: CM	DATE: 6/13/2013	FIG. NO: 6
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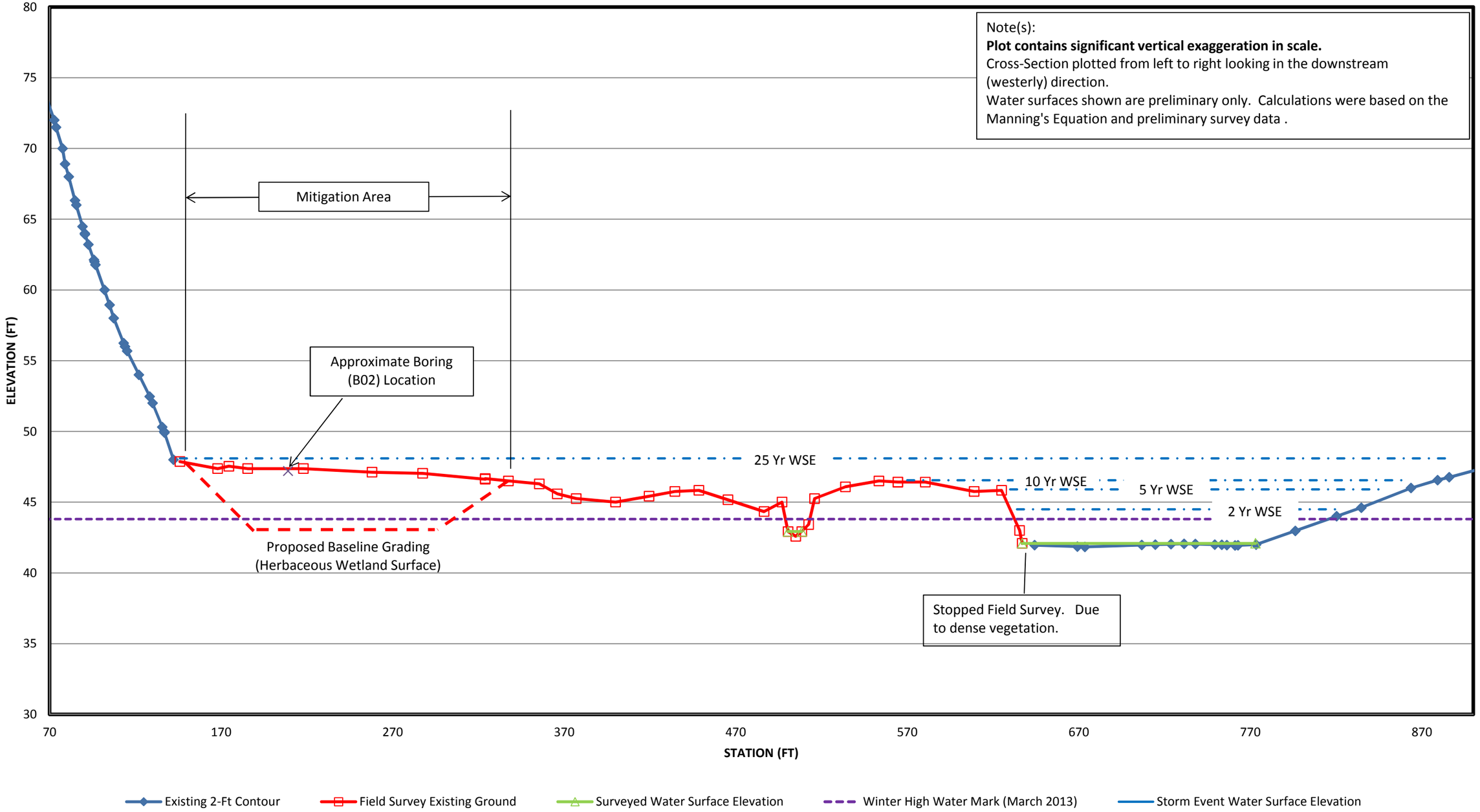
FIGURE 7. LOS PENASQUITOS CREEK
EL CUERVO DEL SUR
CONCEPTUAL GRADING CROSS-SECTION



El Cuervo del Sur Site Boundary (Phase I)
El Cuervo del Sur Site Boundary (Phase II - not a part of this mitigation plan)
Potential Soil Disposal Area
Phase I Soil Disposal (with upland seed mix)
Proposed Road Fill
Expected USACE jurisdiction following implementation

Planting Zones

Herbaceous Wetland
Riparian Scrub
Riparian Transitional

Proposed road fill continues north please refer to figure 8B for full extent

Phase II (not a part of this mitigation plan)

Eucalyptus

Phase I soil disposal with upland seed mix

Existing Shrubs to Remain

Phase I

Proposed road fill continues south please refer to figure 8B for full extent

Palm Trees

Not Impacted

Planting Zones	Phase I	Phase II
Herbaceous Wetland	1.00	0.41
Riparian Scrub	0.94	0.55
Riparian Transitional	0.36	0.46
Total	2.30 acres	1.42 acres

SOURCES: Site Boundary, Buffer, Vegetation, Soil Disposal Area (URS, 2013). Soil (SSURGO, USDA, 2007). Aerial Imagery (SanGIS, 2012).

CONCEPTUAL MITIGATION DESIGN
EL CUERVO DEL SUR HMMP
CITY OF SAN DIEGO

URS

45 0 45 90 Feet

SCALE: 1" = 90' (1:1,080)

SCALE CORRECT WHEN PRINTED AT 11X17

CREATED BY: LR | DATE: 2/25/2015 | FIG. NO: **8A**

PM: BE | PROJ. NO: 27679954.08300

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El Cuervo del Sur Site Boundary (Phase I)

El Cuervo del Sur Site Boundary (Phase II - not a part of this mitigation plan)

Potential Soil Disposal Area

Phase I Soil Disposal (with upland seed mix)

Proposed Road Fill

Planting Zones

Herbaceous Wetland

Riparian Scrub

Riparian Transitional

Phase II
(not a part of this mitigation plan)

Phase I

Phase I soil disposal with upland seed mix

SEA MIST WY

SORRENTO VALLEY BL

SOURCES: Site Boundary, Buffer, Vegetation, Soil Disposal Area (URS, 2013). Soil (SSURGO, USDA, 2007). Aerial Imagery (SanGIS, 2012).

CONCEPTUAL MITIGATION DESIGN
EL CUERVO DEL SUR HMMP
CITY OF SAN DIEGO

URS

150 0 150 300 Feet

SCALE: 1" = 300' (1:3,600)

SCALE CORRECT WHEN PRINTED AT 11X17

CREATED BY: LR | DATE: 2/24/2015 | FIG. NO: **8B**

PM: MT | PROJ. NO: 27679954.08300

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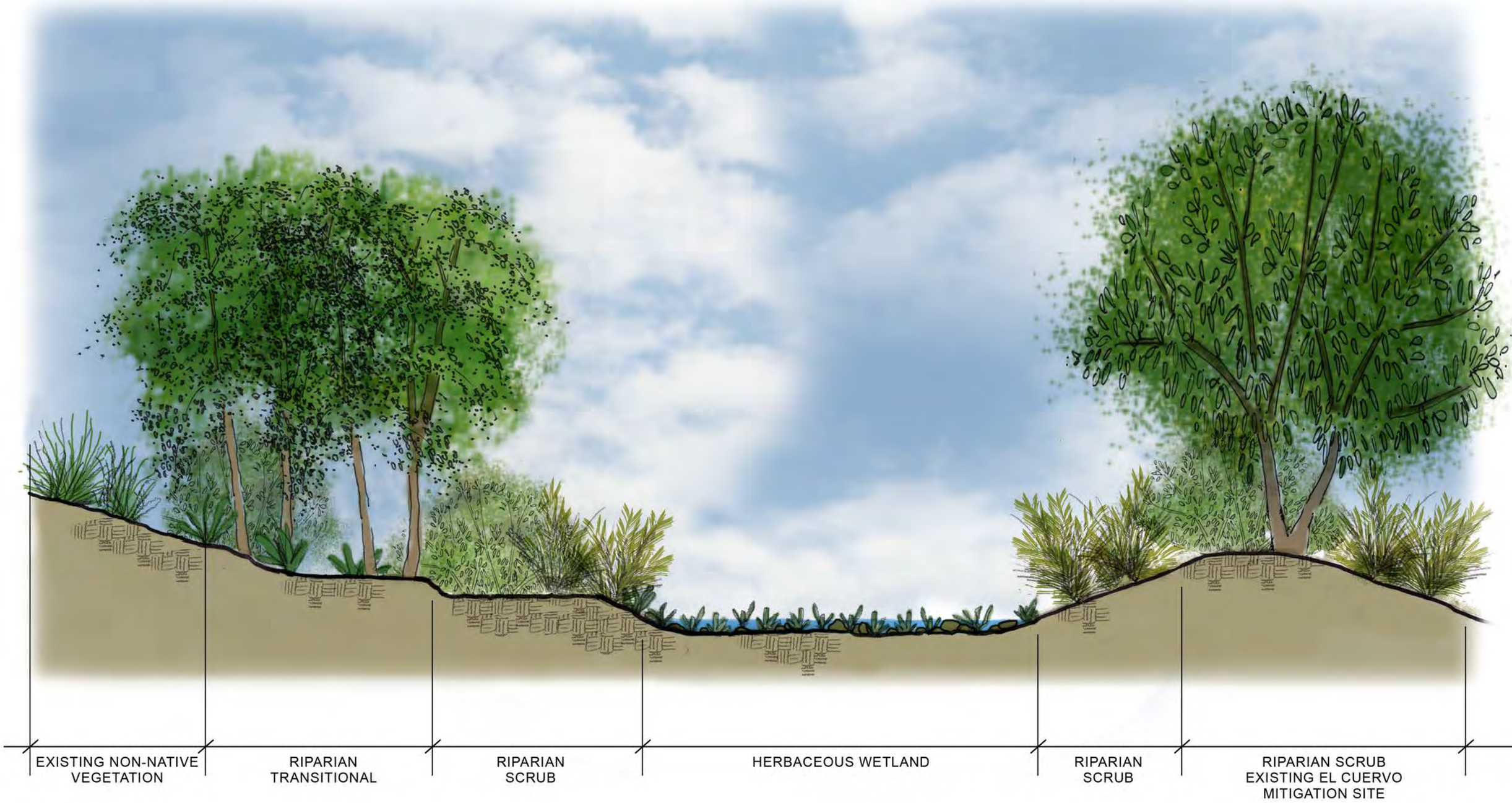

FIGURE 9: CONCEPTUAL MITIGATION DESIGN
CROSS-SECTION, EL CUERVO DEL SUR

URS

El Cuervo del Sur Site Boundary (Phase I)

El Cuervo del Sur Site Boundary (Phase II - not a part of this mitigation plan)

Proposed Contours

Proposed Contours - 1ft

Finished Grade Spot Elevation

Existing Contours

Existing Contours - 10ft

Existing Contours - 1ft

Planting Zones

Herbaceous Wetland

Riparian Scrub

Riparian Transitional

Proposed Soil Disposal Area

Phase II
(not a part of this mitigation plan)

Phase I

Eucalyptus

Existing Shrubs to Remain

Palm Trees

Not Impacted

Planting Zones	Phase I	Phase II
Herbaceous Wetland	1	0.41
Riparian Scrub	0.94	0.55
Riparian Transitional	0.31	0.51
Total	2.25 acres	1.47 acres

SOURCES: Site Boundary, Buffer, Vegetation, Soil Disposal Area (URS, 2013). Soil (SSURGO, USDA, 2007). Aerial Imagery (SanGIS, 2012). Vertical Datum: NAVD 88.

CONCEPTUAL GRADING PLAN
EL CUERVO DEL SUR HMMP
CITY OF SAN DIEGO

URS

45 0 45 90 Feet

SCALE: 1" = 90' (1:1,080)

SCALE CORRECT WHEN PRINTED AT 11X17

CREATED BY: LR | DATE: 2/24/2015 | FIG. NO: **10**

PM: BE | PROJ. NO: 27679954.08300

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