

Devil's Gate Sediment Removal and Management Project Final Habitat Restoration Plan

Pasadena, California, Los Angeles County

Prepared for:

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1.0 INTRODUCTION

1.1 Document Purpose

This Habitat Restoration Plan (HRP) was prepared for the Devil's Gate Reservoir Sediment Removal and Management Project (Project) as required by Conditions 3.9 and 4.1 of the Lake or Streambed Alteration Agreement (LSAA) (Notification No. 1600-2015-0263-R5 dated March 21, 2017) executed between the California Department of Fish and Wildlife (CDFW) and the Los Angeles County Flood Control District (LACFCD). Two amendments to the LSAA were issued by the CDFW in response to modifications to the boundaries of the Project (dated July 17, 2018) and to address the proposed offsite mitigation component (dated July 16, 2018). Per the LSAA, this HRP outlines the methodology for the onsite compensatory mitigation required to offset the temporary and permanent impacts of the Project. The HRP addresses the temporary impact areas within the Initial Sediment Removal Area (ISRA) and the on-site compensatory mitigation areas at the Project site. Onsite compensatory mitigation will include the creation, restoration, and enhancement of native habitats with the purpose of providing quality habitat for an abundance of wildlife including the least Bell's vireo (*Vireo bellii pusillus*), which is listed as endangered under the Federal Endangered Species Act (ESA) and the California Endangered Species Act (CESA) (CDFW 2018). The offsite mitigation at the Petersen Ranch Mitigation Bank (Bank) is described in a separate Habitat Mitigation and Monitoring Plan (HMMP) prepared by the Bank Sponsor.

Onsite compensatory mitigation will include invasive and nonnative weed abatement, planting with native container stock, planting pole cuttings for specific species, seeding with native seed material, and maintaining and monitoring each mitigation area for a period of five years for riparian areas and ten years for upland areas, or until all success criteria have been met. This HRP discusses the methodologies for pre-planting site preparation, container plant installation, seed application, irrigation requirements, maintenance requirements, monitoring requirements, reporting requirements, and performance standards. This HRP also provides contingency measures and an Adaptive Management Plan to follow in the event that performance standards are not met.

The potential onsite mitigation areas described in this HRP were selected because they are located in the Arroyo Seco Watershed, which is the same watershed where the impacts will occur. The location of the mitigation areas is within Devil's Gate Reservoir, where adequate hydrology is available to sustain the mitigation areas for the long-term. Also, siting the compensatory mitigation in Devil's Gate Reservoir provides for the long-term conservation of lands containing aquatic resources that are designated open space and in close proximity to lands owned by the U.S. Forest Service (USFS).

The methodology laid out in the HRP is such that each mitigation area located at the Project site will be discussed, managed, and monitored individually. This will allow for individual mitigation areas to meet success criteria and potentially receive final sign-off independently of one another. Initial vegetation removal will not commence for the Project until LACFCD has received written approval of the HRP from CDFW.

1.2 Project Location

The Project is located in the City of Pasadena (City) in Los Angeles County on the Pasadena United States Geological Survey (USGS) California 7.5' topographic quadrangle (Figure 1-1). More specifically, the Project is located within the upper portion of the Arroyo Seco Watershed within the City's Hahamongna Watershed Park (Figure 1-2). The Project site is located along an approximately 4,754-foot linear section of the Arroyo Seco drainage and alluvial fan, which is an area subject to change and disturbance due to erosion, runoff, and sediment movement. The elevation of the Project site ranges from approximately 985-feet above mean sea level (msl) behind the dam, to approximately 1,100-feet above msl at the northern end of the project.

1.3 Project Summary

Sediment removal efforts have previously taken place at the reservoir in order to ensure correct functioning of the outlet works and/or to maintain reservoir capacity. These activities are granted under the LACFCD Devil's Gate Dam and Reservoir Easement and performed in accordance with the California Environmental Quality Act (CEQA). Since the dam construction in 1920 and prior to the Station Fire in 2009, approximately 10.7 million cubic yards (cy) of sediment accumulated in the reservoir and approximately 8 million cy of sediment was removed. In the two storm seasons following the Station Fire, an additional 1.3 million cy accumulated. While a minimal amount of sediment comes into the reservoir with every storm, most of the sediment comes in large amounts during more intense storm events. The last major Devil's Gate Reservoir sediment removal project occurred in 1994, when 190,000 cy of sediment were removed and trucked offsite. Two smaller sediment removal operations also took place with 14,000 cy removed in 2006 and 3,800 cy removed in 2009. The Project, which includes an initial comprehensive removal of 1.7 million cy of sediment to establish a Permanent Maintenance Area (PMA), will restore flood capacity and establish a reservoir management system to maintain the flood control capacity of the reservoir. Subsequently, annual maintenance and episodic maintenance will be conducted in the established PMA to remove accumulated sediment and to ensure continued flood control capacity. Removal of sediment will not occur outside of the boundaries of the PMA.

The primary objectives of the Project include:

- 1) Reducing flood risk to the communities downstream of the reservoir adjacent to the Arroyo Seco by restoring reservoir capacity for flood control and future sediment inflow events;
- 2) Supporting sustainability by establishing a reservoir configuration more suitable for routine maintenance activities including reservoir management;
- 3) Removing sediment in front of the dam to facilitate an operational reservoir pool to reduce the possibility of plugging the outlet works with sediment or debris during subsequent storm events;
- 4) Removing sediment placed at Johnson Field during the Devil's Gate Reservoir Interim Measures Project (IMP);

- 5) Supporting dam safety by removing sediment accumulated in the reservoir in a timely manner to ensure the ability to empty the reservoir in the event of a dam safety concern; and,
- 6) Delivering the sediment to placement or reuse facilities that are already prepared and designated to accept such material without native vegetation and habitat removal.

The LACFCD completed an Environmental Impact Report (EIR) for the Project, which was certified by the County of Los Angeles Board of Supervisors on November 12, 2014. A Recirculated EIR (REIR), which includes an initial comprehensive removal of 1.7 million cubic yards (cy) of sediment, was certified by the County of Los Angeles Board of Supervisors on November 7, 2017.

The Project will initially remove vegetation and 1.7 million cy of sediment from the ISRA, which will impact a 65.56-acre area within the reservoir behind Devil's Gate Dam that are subject to CDFW jurisdiction. After the initial sediment removal is completed, 49.39 acres will be maintained for flood capacity through routine annual maintenance and episodic maintenance. The routine annual maintenance area, or Annual Maintenance Area (AMA) will include 42.05-acres where sediment will subsequently be removed on an annual basis (Figure 1-3). The Episodic Maintenance Area (EMA) includes the 7.34 acres of side slopes around the edges of the AMA, which is located within the PMA. The impacts of the Project will include permanent impacts to 42.05 acres and temporary impacts to 23.52 acres of areas that fall under the jurisdiction of the CDFW. The temporary impacts include 16.18 acres within the ISRA and the 7.34 acres in the EMA.

The onsite mitigation for the Project includes the creation, restoration, and enhancement of 72.11 acres subject to CDFW jurisdiction located outside of the PMA. In addition, the EMA, or side slopes of the PMA, which encompass 7.34 acres, will be replanted with native vegetation, including shrub and annual species associated with riparian scrub and alluvial scrub vegetation communities. Allowing the side slopes of the AMA to support native vegetation will provide additional compensatory mitigation by creating a riparian scrub buffer habitat between the areas that are actively managed in the annual maintenance area and the compensatory mitigation areas. The side slopes may be periodically affected by re-contouring if large sediment deposits bury portions of the side slopes. In this case, the sediment will be removed, and the side slopes will be re-contoured and allowed to naturally revegetate.

Approximately 16.18 acres of temporary impact areas within the ISRA will be restored to native vegetation as part of the compensatory mitigation plan for the Project. Impacts to these areas will be delayed until the final year of initial sediment removal and then the areas will be replanted and seeded with native vegetation shortly thereafter to minimize the temporal impacts in these areas.

The compensatory mitigation areas will be protected for the long-term and will be maintained and monitored to ensure the established performance standards are met.

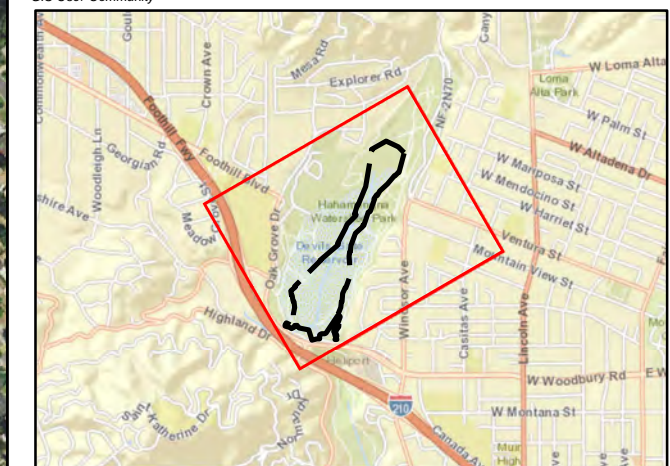
**Figure 1-3
Proposed Project**

Map Features

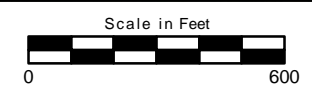
-  Initial Project Footprint ¹
-  Annual Maintenance Footprint ¹
-  Permanent Impact Area ¹
-  Temporary Impact Area ¹
-  Side Slopes ¹



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1.4 Onsite Ownership Information

The City is the owner of the underlying lands within Devil's Gate Reservoir where the proposed onsite mitigation areas are located. The LACFCD holds a perpetual flood control easement from the City to operate the Devil's Gate Dam and the associated reservoir, which means the flood control easement does not expire nor does it need to undergo a renewal process after a certain time period has passed. This is a permanent agreement between LACFCD and the City. The City contact information is as follows:

City of Pasadena
100 North Garfield Avenue
Pasadena, California 91109
Tel: (626) 744-4000

1.5 Required Compensatory Mitigation

The LSAA issued by the CDFW for the Project on March 21, 2017 provided a breakdown of the required onsite and offsite compensatory mitigation for permanent impacts (Condition 3.1) as well as the mitigation required for the temporary impacts of the Project (Condition 3.2). The LSAA amendment issued on July 17, 2018 provided a revision to the Project impacts that were based on a revised Project boundary and also revised Condition 3.1 to reflect modifications to the required onsite mitigation. Table 1 lists the revised onsite compensatory mitigation requirements for the permanent impacts of the Project that were included in the LSAA amendment dated July 17, 2018.

VEGETATION COMMUNITY IMPACTS		COMPENSATORY MITIGATION REQUIREMENT		
VEGETATION COMMUNITIES	Permanent Impacts	Creation	Restoration	Total
<i>Salix gooddingii</i> Woodland Alliance	15.64	15.64	21.44	37.08
<i>Baccharis salicifolia</i> Shrubland Alliance	9.71	9.71	5.84	15.55
<i>Lepidospartum squamatum</i> Shrubland Alliance	1.97	1.97	7.88	9.85
<i>Artemisia californica</i> - <i>Eriogonum fasciculatum</i> Shrubland Alliance	0.01	0.01	0.02	0.03
<i>Conium maculatum</i> Herbaceous Semi-Natural Alliance	2.61	0.00	1.31	1.31
<i>Lepidium latifolium</i> – <i>Conium maculatum</i> Herbaceous Semi-Natural Alliance	10.24	0.00	5.12	5.12
<i>Xanthium strumarium</i> Herbaceous Alliance (Unofficial Alliance)	0.67	0.00	1.00	1.00
Disturbed/Developed	1.13	0.00	0.00	0.00
TOTAL COMPENSATORY MITIGATION REQUIRED		27.33	42.61	69.94
TOTAL PERMANENT IMPACTS		41.98		

The required mitigation for temporary impacts in the LSAA amendment dated July 17, 2018 is the restoration of the vegetation communities in the 23.52 acres of temporary impact areas within the ISRA. The mitigation includes delaying the impacts to 16.17 acres of vegetation and habitat communities located in the restoration areas designated as DG-7, DG-8, and DG-9 until the third year of the sediment

removal project and implementing the restoration in these areas within 24 months of the impacts. In addition, the LSAA amendment stated that the 7.34-acre EMA will initially be planted with appropriate native plants and thereafter, annual undesirable plant control will take place. If the EMA areas are affected by large debris flows, then sediment excavation/trucking offsite will be conducted, and the slopes will be returned to the 3:1 (V:H) grade followed by continuing annual undesirable plant control.

The offsite compensatory mitigation requirement in Condition 3.1 of the original LSAA dated March 21, 2017 was revised in the July 16, 2018 LSAA amendment. The revised condition states that the LACFCD shall propose an offsite compensatory mitigation plan for an additional 25.6 acres of native habitats. It also states that the 25.6 acres should consist of creation and restoration of willow and mulefat thickets and alluvial shrubland. Any remaining acres of compensatory mitigation may be in the form of restoration and may be composed of riparian herbaceous habitats associated with intermittently or seasonally-flooded ponds, wetlands, seeps, swales, or margins of riparian areas. In lieu of the restoration or creation, CDFW may consider enhancement and/or preservation of habitat classifications in a larger area. Condition 3.3 in the July 16, 2018 LSAA amendment states that LACFCD shall submit a Conceptual Off-site Mitigation Package prior to the Project start. The condition was also revised to state that the LACFCD shall develop the mitigation proposal with Land Veritas at the Petersen Ranch Mitigation Bank. The habitat creation and restoration activities proposed at the Petersen Ranch Mitigation Bank are detailed in a separate HMMP prepared by Land Veritas and WRA, Inc. Therefore, the off-site mitigation will not be described in this HRP.

1.6 Restoration Objectives

The primary goal of the onsite compensatory mitigation is to improve the habitats and the function of those habitats in the Devil's Gate Reservoir and the Arroyo Seco Watershed and to enhance native habitat for a variety of wildlife species, including the least Bell's vireo. Discrete objectives for the compensatory mitigation include:

- Offsetting 65.56 acres of total impacts to areas under CDFW jurisdiction, including 42.05 acres of permanent impacts and 23.52 acres of temporary impacts through the onsite creation, restoration, and enhancement of 72.11 acres (69.54 acres not including the easements) riparian habitats, RAFSS, oak woodland, and upland buffer habitats and the restoration of 7.34 acres (7.19 acres not including the easements) of buffer habitat on the side slopes of the Permanent Maintenance Area.
- Re-contouring, grading, planting of native riparian vegetation, and monitoring of mitigation areas while incorporating multi-use recreation in accordance with the Hahamongna Watershed Park Master Plan (HWPMP),
- Increasing the aquatic resource functions, quality of riparian and upland vegetation communities, habitat connectivity, and riparian habitat structure and diversity,
- Reducing exotic plant species cover and prevalence, and
- Developing mitigation areas that provide suitable habitat for federally and state-listed species, including least Bell's vireo.

1.7 Site Selection Criteria – Onsite Mitigation Areas

Onsite mitigation areas were selected to offset impacts to stream habitat. The compensatory mitigation areas were selected based on the following criteria:

- Potential to locate onsite compensatory mitigation areas in the appropriate parts of the Arroyo Seco Watershed to achieve a functional lift through the creation, restoration, and enhancement of aquatic resources, riparian habitat, and habitat buffer areas;
- Availability of adequate hydrology (both surface and subsurface) to sustain the mitigation areas for the long-term;
- Opportunity to conserve onsite lands containing aquatic resources that are located in close proximity to existing preserved lands or open space, and;
- Opportunity to conserve onsite lands that may provide suitable habitat for least Bell's vireo, a federally and state listed wildlife species.

2.0 EXISTING CONDITIONS

2.1 Mitigation Site Location

The onsite areas that are proposed as mitigation for the Project are within Devil's Gate Reservoir and Hahamongna Watershed Park (Figure 2-1). The areas all fall within the 1,070-foot elevation contour High Water Mark (HWM) that has been identified for the Project. The 1,070-foot HWM is the elevation of the crest of the dam and represents the limit of water held behind the dam and the limit of CDFW jurisdiction. Numerous opportunities for improving the existing habitat in and adjacent to the reservoir were identified. Opportunities include creation, restoration, and enhancement of riparian woodland and scrub, oak riparian woodland, coastal sage scrub and buckwheat scrub, and Riversidean alluvial fan sage scrub habitats.

2.2 Existing Soil Characteristics

The existing soil characteristics at the proposed mitigation areas are suitable for the restoration of riparian habitats. The existing habitat type in and adjacent to the mitigation areas is riparian with a predominance of willows (*Salix* spp.), cottonwoods (*Populus* spp.), and mulefat (*Baccharis salicifolia*). Those areas dominated by nonnative and invasive species, that likely supported native vegetation prior to the large influx of sediment following the Station Fire, are also located within the reservoir and would be expected to exhibit similar soil characteristics as the areas dominated by riparian plant species.

The two soil types that have been identified in the reservoir include Ramona Sandy Loam and Hanford Gravelly Loam. Ramona Gravelly Loam consists of fine, well-drained, sandy loam soil formed from the breakdown of granite rock. This type of soil has moderately slow permeability and is typically observed on terraces and in alluvial fans with flat to slightly sloped topography at elevations ranging from 250 feet above msl to 3,500 feet above msl. Hanford Gravelly Sandy Loam consists of well-drained soil typically found on stream bottoms, floodplains, and alluvial fans on slopes from 0 to 15 percent.

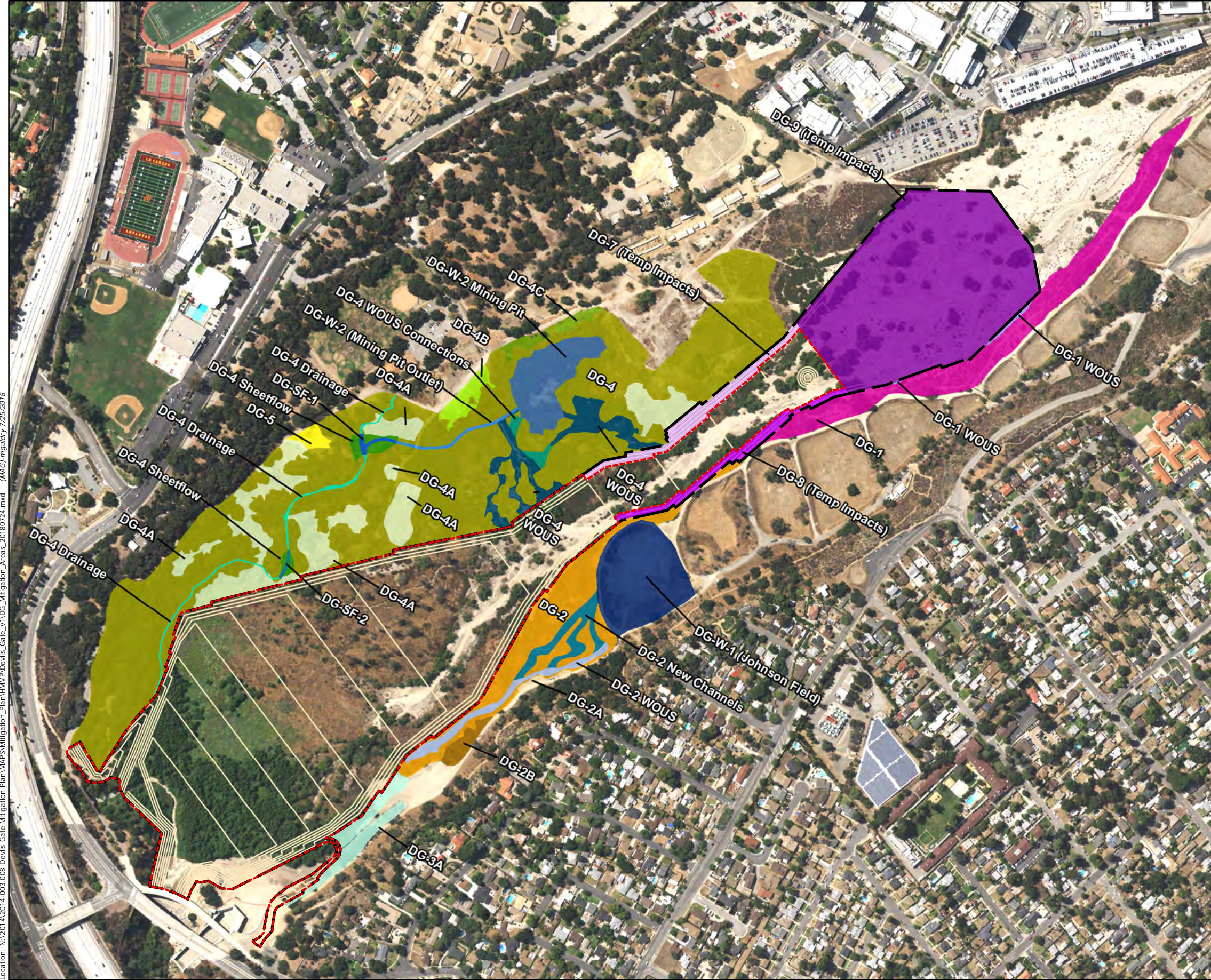


Figure 2-1
Devil's Gate Mitigation Areas

Map Features

- Initial Sediment Removal Footprint ¹
- Permanent Maintenance Footprint ¹
- Sediment Removal Excavation Contours ¹

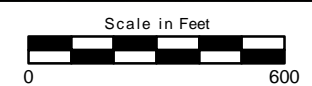
Mitigation Areas

- DG-1
- DG-1 WOUS
- DG-2
- DG-2 New Channels
- DG-2 WOUS
- DG-2A
- DG-2B
- DG-3A
- DG-4
- DG-4 Drainage
- DG-4 Sheetflow
- DG-4 WOUS
- DG-4 WOUS Connections
- DG-4A
- DG-4B
- DG-4C
- DG-5
- DG-7 (Temp Impacts)
- DG-8 (Temp Impacts)
- DG-9 (Temp Impacts)
- DG-SF-1
- DG-SF-2
- DG-W-1 (Johnson Field)
- DG-W-2 (Mining Pit)
- DG-W-2 (Mining Pit Outlet)

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This soil forms at elevations ranging from 150 feet above msl to 3,500 feet above msl and is primarily from granite and other quartz containing rock.

Because post-sediment removal compensatory mitigation is planned to take place where riparian vegetation communities currently exist, it is presumed that the existing soil type within the Project site will be appropriate for the type of planned mitigation. Soils composition below sediment buildup is presumed to be supportive of riparian vegetation communities. Compensatory mitigation measures taking place at Johnson Field, consisting of removing deposited sediment, will presumably expose native soil that can support riparian vegetation communities and reconnect the area to the existing channel. It is assumed that the majority of the mitigation areas will not require soil amendments or measures to alleviate soil compaction.

2.3 Existing Vegetation Communities – Project Site and Surrounding Areas

Table 2 lists total acreage of each vegetation community within the areas that were mapped for the Project in 2016 and descriptions of each vegetation community follow the table. Several vegetation mapping efforts have been conducted for the Project site between 2010 and 2016. The most recent mapping effort was conducted in 2016 by ECORP to capture the expanded infestation of nonnative and invasive plant species in the reservoir (ECORP 2016d). The 2016 vegetation map for the Project site and surrounding areas is included as Figure 2-2.

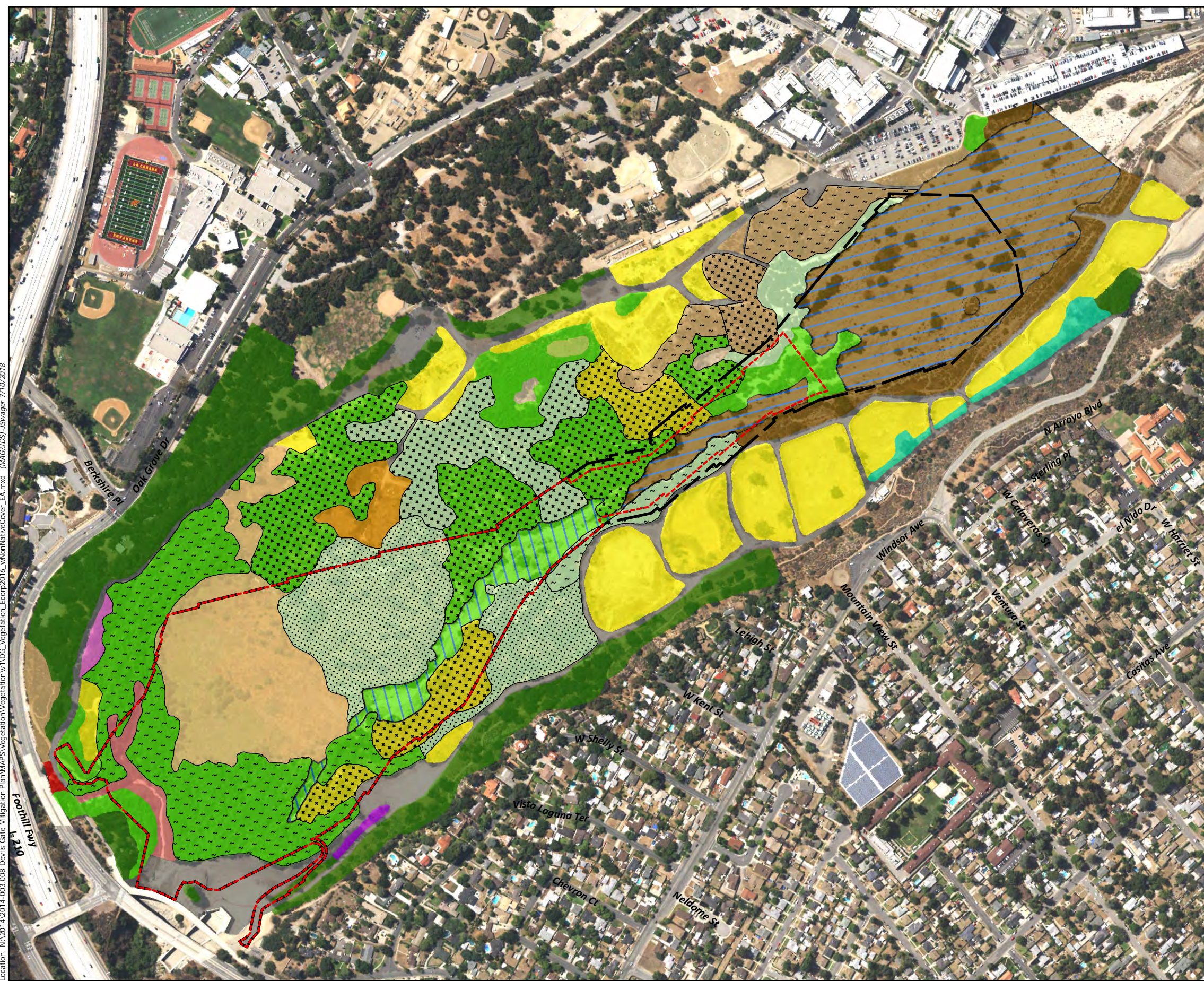
Table 2. Acreages of Existing Vegetation Communities 2016	
Vegetation Community	Total Mapped Acreage
RIPARIAN/FLOODPLAIN	
<i>Salix gooddingii</i> Woodland Alliance	7.45
<i>Salix gooddingii</i> Woodland Alliance - Sparse	4.20
<i>Salix gooddingii</i> Woodland Alliance-20% <i>Lepidium latifolium</i> - <i>Xanthium strumarium</i>	15.88
<i>Salix gooddingii</i> Woodland Alliance-30% <i>Lepidium latifolium</i> - <i>Xanthium strumarium</i>	15.12
<i>Salix gooddingii</i> Woodland Alliance	42.65
<i>Baccharis salicifolia</i> Shrubland Alliance-No Understory	2.17
<i>Baccharis salicifolia</i> Shrubland Alliance-20% <i>Conium maculatum</i> - <i>Lepidium latifolium</i>	2.04
<i>Baccharis salicifolia</i> Shrubland Alliance-30% <i>Conium maculatum</i> - <i>Lepidium latifolium</i>	6.84
<i>Baccharis salicifolia</i> Shrubland Alliance-40% <i>Conium maculatum</i> - <i>Lepidium latifolium</i>	14.18
<i>Baccharis salicifolia</i> Shrubland Alliance	25.23
Total Riparian	67.88
FLOODPLAIN	
<i>Lepidospartum squamatum</i> Shrubland Alliance	5.08
<i>Lepidospartum squamatum</i> Shrubland Alliance (Sparse)	22.19
<i>Lepidospartum squamatum</i> Shrubland Alliance	27.27
Total Floodplain	27.28
NATIVE UPLAND	
<i>Artemisia californica</i> – <i>Eriogonum fasciculatum</i> Shrubland Alliance	1.88

Table 2. Acreages of Existing Vegetation Communities 2016	
Vegetation Community	Total Mapped Acreage
<i>Artemisia californica</i> – <i>Eriogonum fasciculatum</i> Shrubland Alliance-20% <i>Lepidium latifolium</i>	4.38
<i>Artemisia californica</i> – <i>Eriogonum fasciculatum</i> Shrubland Alliance-30% <i>Lepidium latifolium</i>	2.08
<i>Quercus agrifolia</i> Alliance	22.80
<i>Platanus racemosa</i> Woodland Alliance - Disturbed	1.58
Total Native Upland	32.72
NONNATIVE/OTHER	
<i>Brassica nigra</i> and other mustards Herbaceous Semi-Natural Alliance	23.09
<i>Conium maculatum</i> Herbaceous Semi-Natural Alliance	6.23
<i>Lepidium latifolium</i> – <i>Conium maculatum</i> Herbaceous Semi-Natural Alliance	13.28
<i>Lepidium latifolium</i> Herbaceous Semi-Natural Alliance	1.80
<i>Rumex crispus</i> Herbaceous Semi-Natural Alliance (Unofficial Alliance)	0.30
<i>Xanthium strumarium</i> Herbaceous Alliance (Unofficial Alliance)	1.50
<i>Eucalyptus (globulus, camaldulensis)</i> Woodland Semi-Natural Alliance	0.27
<i>Fraxinus velutina</i> Forest Alliance (Unofficial Alliance)	0.46
Landscaped	0.15
Depression/Bare Ground (Associated with Seasonally Wet Area)	0.39
Disturbed (Barren/Trails/IMP Area)	16.08
Total Other	63.55
TOTAL	191.42

***Salix gooddingii* Woodland Alliance – Undisturbed and Disturbed Black Willow Thickets**

A total of approximately 42.65 acres of undisturbed and disturbed black willow thickets is present in the Project area. The undisturbed forms of this alliance generally exhibit an understory comprised of native plant species or exhibit a very sparse and open understory with little or no plant species present. The areas considered undisturbed comprise approximately 11.65 acres or 27 percent of all of the black willow thickets in the Project area. The disturbed forms of this alliance support an understory of native plant species but also support varying percentages of nonnative and invasive plant species. The nonnative and invasive plants in the understory contribute to the degradation of the black willow thicket plant community because they easily out-compete the native plant species. The disturbed forms of this alliance comprise approximately 31.00 acres or 73 percent of all of the black willow thickets in the Project area.

Figure 2-2.
Vegetation Communities



Map Features

- Initial Sediment Removal Footprint ¹
- Permanent Maintenance Footprint ¹

Vegetation Name

- Artemisia californica - Eriogonum fasciculatum Shrubland Alliance
- Baccharis salicifolia Shrubland Alliance
- Brassica nigra and other mustards Herbaceous Semi-Natural Alliance
- Conium maculatum Herbaceous Semi-Natural Alliance 30% Lepidium latifolium
- Depression/Bare ground
- Disturbed
- Eucalyptus (globulus, camaldulensis) Woodland Semi-Natural Alliance
- Fraxinus velutina Forest Alliance
- Landscaped
- Lepidium latifolium Herbaceous Semi-Natural Alliance
- Lepidium latifolium-Conium maculatum Herbaceous Semi-Natural Alliance
- Lepidospartum squamatum Shrubland Alliance
- Lepidospartum squamatum Shrubland Alliance - Sparse
- Platanus racemosa Woodland Alliance Disturbed
- Quercus agrifolia Woodland Alliance
- Rumex crispus Herbaceous Semi-Natural Alliance
- Salix gooddingii Woodland Alliance
- Salix gooddingii Woodland Alliance - Sparse
- Xanthium strumarium Herbaceous Alliance

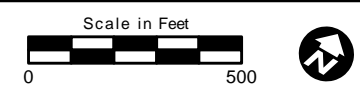
% Non-Native Cover

- 20%
- 30%
- 40%

Service Layer Credits: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, © OpenStreetMap contributors, and the GIS User Community



Location: N:\2014\2014-003.008 Devil's Gate Sediment Removal Project\Map\Map_S_Vegetation\Vegetation_V.DG_Vegetation_Ecrop2016_wNonNativeCover_EA.mxd (MAG/IDS)_Svagner_7/10/2018



***Salix gooddingii* Woodland Alliance**

This alliance generally occurs between 0 and 1,640 feet above msl on terraces along large rivers, in canyons, and along rocky floodplains of small, periodic streams, seeps and springs. In this alliance, black willow (*Salix gooddingii*) is dominant or co-dominant in the tree canopy with Fremont's cottonwood (*Populus fremontii*), arroyo willow (*Salix lasiolepis*), red willow (*S. laevigata*), black elderberry (*Sambucus nigra*), and other trees. The shrub layer includes mulefat, coyote bush (*Baccharis pilularis*), and American dogwood (*Cornus sericea*). This form of black willow thickets, which is considered undisturbed, is dominated by native plant species and the distribution of nonnative plant species in the understory is low. Trees in this alliance are typically smaller than 30 m in height and form an open to continuous canopy. The shrub layer is open to continuous and the herb layer is variable. Within the Project area, this alliance also variously displays an understory/sub-shrub layer co-dominated by perennial pepperweed and poison hemlock (*Conium maculatum*), an understory seasonally dominated by rough cocklebur (*Xanthium strumarium*), a bare-ground understory on the margins of the main channel, and/or an understory of native annuals. This alliance occupies approximately 7.45 acres within the Project area. This alliance is primarily located along the central portion of the Project area generally surrounding the areas of mulefat thickets (*Baccharis salicifolia* Shrubland Alliance) and poison hemlock – perennial pepperweed patches (*Lepidium latifolium*-*Conium maculatum* Herbaceous Semi-Natural Alliance).

Sparse *Salix gooddingii* Woodland Alliance

This a variation of the black willow thickets in which the vegetation community exists as previously described in the unaltered description but at a greatly diminished cover value. Within the Project area, this alliance displays a sparse understory of native annuals on the borders and within the main channel. Approximately 4.20 acres within the Project area is covered by this alliance and it is generally present along the active channel that conveys water from areas upstream through the reservoir to the dam. This vegetation community is bordered by mulefat thickets and upland mustards (*Brassica nigra* and other mustards Herbaceous Semi-Natural Alliance).

Salix gooddingii* Woodland Alliance – Understory 20% *Lepidium latifolium*-*Xanthium strumarium

This form of black willow thickets is considered disturbed due to the presence of nonnative and invasive plant species in the understory. The native plant composition is similar to the description above for this vegetation community alliance but the understory is dominated by approximately 20 percent cover of perennial pepperweed and rough cocklebur. Approximately 15.88 acres of black willow thickets containing approximately 20 percent cover of perennial pepperweed and rough cocklebur is present in the Project area.

Salix gooddingii* Woodland Alliance – Understory 30% *Lepidium latifolium*-*Conium maculatum

This form of black willow thickets is also considered disturbed due to the presence of nonnative and invasive plant species in the understory. The native plant composition is similar to the description above for the black willow thickets but the understory is dominated by approximately 30 percent cover of

perennial pepper weed and poison hemlock. Approximately 15.12 acres of black willow thickets containing approximately 30 percent cover of perennial pepperweed and poison hemlock is present in the Project area.

***Baccharis salicifolia* Shrubland Alliance – Undisturbed and Disturbed Mulefat Thickets**

A total of approximately 25.23 acres of undisturbed and disturbed mulefat thickets is present in the Project area. This alliance occurs in two general forms in the Project area, including one with little or no understory of other plant species and the other with varying percentages of nonnative and invasive plant species in the understory. The areas where the mulefat thickets contain little to no understory comprise approximately 2.17 acres or 8 percent of all of the mulefat thickets in the Project area. The disturbed forms of this alliance exhibit a codominance of nonnative and invasive plant species. The nonnative and invasive plants in the understory contribute to the degradation of the mulefat thicket plant community because they easily out-compete the native plant species. The disturbed forms of this alliance comprise approximately 23.06 acres or 92 percent of all of the mulefat thickets in the Project area.

***Baccharis salicifolia* Shrubland Alliance – No Understory**

This alliance generally occurs between 0 and 1,250 m above msl in mixed alluvium soils in canyon bottoms, floodplains, irrigation ditches, lake margins, and stream channels. In this alliance, mulefat is dominant or may be co-dominant with other shrub species including California sagebrush (*Artemisia californica*), tree tobacco (*Nicotiana glauca*), arrow weed (*Pluchea sericea*), sandbar willow (*Salix exigua*), arroyo willow, laurel sumac (*Malosma laurina*), and black elderberry. Additionally, emergent trees including California sycamore (*Platanus racemosa*), Fremont's cottonwood, oak (*Quercus* spp.), and willow may also be present in low cover. Shrubs are typically less than 5 m tall and the canopy is continuous with two tiers at 2 m and 5 m. In addition, the herbaceous layer is usually thin. This alliance, which is present on approximately 2.17 acres of the Project area, is primarily located in the central portion of the Project area and is generally surrounded by black willow thickets.

Baccharis salicifolia* Shrubland Alliance – 20% *Conium maculatum*-*Lepidium latifolium

Within the Project area, this form of the mulefat thickets also supports the native plant species discussed for the undisturbed form of the alliance, but it displays an understory/sub-shrub layer co-dominated by approximately 20 percent poison hemlock and perennial pepperweed. Approximately 2.04 acres of this form of disturbed mulefat thickets is present in the Project area. This is approximately 8 percent of the total mulefat thickets in the Project area.

Baccharis salicifolia* Shrubland Alliance – 30% *Conium maculatum*-*Lepidium latifolium

Within the Project area, this form of the *Baccharis salicifolia* Shrubland Alliance also supports the native plant species discussed for the undisturbed form of the alliance, but it displays an understory/sub-shrub layer co-dominated by approximately 30 percent poison hemlock and perennial pepperweed. Approximately 6.84 acres of this form of disturbed *Baccharis salicifolia* Shrubland Alliance is present in the Project area. This is approximately 27 percent of the total *Baccharis salicifolia* Shrubland Alliances in the Project area.

Baccharis salicifolia* Shrubland Alliance – 40% *Conium maculatum*-*Lepidium latifolium

Within the Project area, this form of the *Baccharis salicifolia* Shrubland Alliance also supports the native plant species discussed for the undisturbed form of the alliance, but it displays an understory/sub-shrub layer co-dominated by approximately 40 percent poison hemlock and perennial pepperweed.

Approximately 14.18 acres of this form of disturbed *Baccharis salicifolia* Shrubland Alliance is present in the Project area. This is approximately 56 percent of the total *Baccharis salicifolia* Shrubland Alliances in the Project area.

***Lepidospartum squamatum* Shrubland Alliance – Dense and Sparse Scalebroom Scrub**

A total of approximately 27.27 acres of scalebroom scrub is present in two forms in the Project area. The two forms include a dense and more mature form that is present on the banks of the upstream portion of the Project area and the other is a sparser form that occurs in the active wash. The denser form occupies approximately 5.08 acres or 18 percent of the total area covered by this alliance and the sparser form covers approximately 22.19 acres or 81 percent.

***Lepidospartum squamatum* Shrubland Alliance**

This alliance is generally found between 164 and 4,921 feet above msl in intermittently or rarely flooded, low gradient alluvial deposits along streams, washes and fans. In this alliance scalebroom (*Lepidospartum squamatum*) is dominant, or co-dominant, or conspicuous in the shrub canopy in association with burrobrush (*Ambrosia salsola*), California sagebrush, mulefat, brittlebush (*Encelia farinosa*), yerba santa (*Eriodictyon* sp.), laurel sumac, California buckwheat (*Eriogonum fasciculatum*), sugar bush (*Rhus ovata*), poison oak, and other shrubs. The shrubs in this alliance are typically less than 2 m in height and some emergent taller plants may be present at low cover including California sycamore, cottonwoods, and black elderberry. The herbaceous layer varies and may be grassy. This alliance within the Project area may be considered equivalent to a Riversidean Alluvial Fan Sage Scrub described in *Preliminary Descriptions of the Terrestrial Natural Communities of California* (Holland 1986). Approximately 5.08 acres of scalebroom scrub is present within the Project area. This denser form of the alliance makes up approximately 19 percent of the scalebroom scrub in the Project area. This alliance is located along the banks of the channel in the northeastern portion of the Project area and is generally surrounded by the upland mustards, mulefat thickets, black willow thickets, and California sagebrush-California buckwheat scrub.

***Lepidospartum squamatum* Shrubland Alliance – Sparse**

This a variation of the scalebroom scrub in which the vegetation community exists as described in the unaltered description (see previous) but at a greatly diminished cover value. This community refers to the upstream regions of the riparian corridor where the channel widens and vegetation occurs as single individuals of different taxa or small islands of associated taxa spaced throughout the corridor. The species present tend to be species associated with seasonal water channels and range from medium-sized shrubs (e.g. scale broom) to full-size cottonwoods and willows. While both woodland and shrub species are present, herbaceous species are almost totally lacking. A canopy is lacking except for within the islands of cottonwoods and/or willows. Approximately 22.19 acres of sparse scalebroom scrub is present

in the Project area. This is approximately 81 percent of the total acres of scalebroom scrub in the Project area. This alliance variation occupies the open wash in the upstream portion of the Project area.

***Artemisia californica*-*Eriogonum fasciculatum* Shrubland Alliance – Undisturbed and Disturbed California Sagebrush-California Buckwheat Scrub**

A total of approximately 8.34 acres of undisturbed and disturbed California sagebrush-California buckwheat scrub is present in the Project area. The undisturbed form of this alliance generally exhibits an understory comprised of native plant species. The areas considered undisturbed comprise approximately 1.88 acres or 23 percent of all of the California sagebrush-California buckwheat scrubs in the Project area. The disturbed forms of this alliance support an understory of native plant species but also support varying percentages of nonnative and invasive plant species. The nonnative and invasive plants in the understory contribute to the degradation of the California sagebrush-California buckwheat scrub plant community because they easily out-compete the native plant species. The disturbed forms of this alliance comprise approximately 6.46 acres or 77 percent of all of the California sagebrush-California buckwheat scrub in the Project area.

***Artemisia californica*-*Eriogonum fasciculatum* Shrubland Alliance**

This alliance is generally found between 820 and 3,115 feet in alluvial or colluvial soils on slopes that are usually steep, south facing, and are rarely flooded or in low-gradient deposits along streams. California sagebrush and California buckwheat are co-dominant in the shrub canopy with each species having 30 to 60 percent relative cover. Associated species include chamise (*Adenostoma fasciculatum*), laurel sumac, California ephedra (*Ephedra californica*), lemonade berry (*Rhus integrifolia*), white sage (*Salvia apiana*), and other shrubs present at low cover. The canopy is intermittent to continuous and may be two-tiered with the upper layer less than 5 m and most shrubs less than 2 m. The herbaceous layer varies both seasonally and annually. This alliance, which covers approximately 1.88 acres, is primarily located along the northwestern edge of the Project area with a small patch also located in the southwest portion of the site, adjacent to Oak Grove Drive. In the northwestern areas, this alliance is generally bordered by the upland mustards, sparse scalebroom scrub, and mulefat thickets.

Artemisia californica*-*Eriogonum fasciculatum* Shrubland Alliance – 20% *Lepidium latifolium

This form of California sagebrush-California buckwheat scrub is considered disturbed due to the presence of invasive plant species in the understory. The native plant composition is similar to the description above for this alliance but the understory is dominated by approximately 20 percent cover of perennial pepperweed. Approximately 4.38 acres of California sagebrush-California buckwheat scrub containing approximately 20 percent cover of perennial pepperweed is present in the Project area.

Artemisia californica*-*Eriogonum fasciculatum* Shrubland Alliance – 30% *Lepidium latifolium

This form of California sagebrush-California buckwheat scrub is considered disturbed due to the presence of invasive plant species in the understory. The native plant composition is similar to the description above for this vegetation community alliance but the understory is dominated by approximately 30 percent cover of perennial pepperweed. Approximately 2.08 acres of California sagebrush-California

buckwheat scrub containing approximately 30 percent cover of perennial pepperweed is present in the Project area.

***Quercus agrifolia* Woodland Alliance - Coast Live Oak Woodland**

This alliance generally occurs between 0 and 3,937 feet in habitats with deep, loamy, or sandy soils with a high amount of organic matter and on alluvial terraces, canyon bottoms, stream banks, slopes, and flats. In this alliance, coast live oak (*Quercus agrifolia*) is dominant or may be co-dominant in association with other trees including bigleaf maple (*Acer macrophyllum*), boxelder (*A. negundo*), California sycamore, Fremont's cottonwood, blue oak (*Quercus douglasii*), valley oak (*Q. lobata*), black oak (*Q. kelloggii*), and arroyo willow. The canopy is open to continuous with trees being less than 98 feet tall. A sparse to intermittent shrub layer may be present as well as a sparse to grassy herbaceous layer. Within the Project area, this alliance also variously displays a disturbed bare-ground understory associated with recreational use within the Park, an understory of nonnative grasses and forbs, and/or escaped horticultural cultivars. Approximately 22.80 acres of coast live oak woodland is present within the Project area. This alliance is primarily located along the western side in Oak Grove Park and along the eastern side along the base of the hills below the residential development. This alliance generally occurs in the more upland portions of the Project area.

***Platanus racemosa* Woodland Alliance Disturbed – California Sycamore Woodlands**

This alliance generally occurs between 0 and 7,874 feet and may be present in gullies, intermittent streams, springs, seeps, stream banks, and terraces adjacent to floodplains that are subject to high-intensity flooding. Soils are rocky or cobbly alluvium with permanent moisture at depth. In this alliance, California sycamore is dominant or co-dominant in the tree canopy with white alder (*Alnus rhombifolia*), southern California black walnut (*Juglans californica*), Fremont's cottonwood, coast live oak, valley oak (*Quercus lobata*), sandbar willow, black willow, red willow, arroyo willow, yellow willow (*S. lutea*), Peruvian peppertree (*Schinus molle*), and California bay (*Umbellularia californica*). The canopy is open to intermittent with trees generally being less than 35 m tall. An open to intermittent shrub layer may be present as well as a sparse to grassy herbaceous layer. Within the Project area, this alliance also variously displays a disturbed bare-ground understory associated with recreational use within the Park, an understory of nonnative grasses and forbs, and/or escaped horticultural cultivars. Approximately 1.58 acres of Disturbed California sycamore woodlands is present along the edges of the percolation basins located in the northeastern portion of the Project area. This alliance is generally surrounded by the upland mustards.

***Brassica nigra* and other mustards Herbaceous Semi-Natural Alliance – Upland Mustards**

This alliance generally occurs between 0 and 4,921 feet and may be present in fallow fields, grasslands, roadsides, levee slopes, disturbed coastal scrub, riparian areas, and waste places. In this alliance, black mustard (*Brassica nigra*), common mustard (*B. rapa*), Saharan mustard (*B. tournefortii*), short podded mustard (*Hirschfeldia incana*), Dyer's woad (*Isatis tinctoria*) or wild radish (*Raphanus sativus*) are dominant or co-dominant in the herbaceous layer with emergent trees and shrubs that may be present at low cover. This alliance is dominated by nonnative, invasive grasses. The canopy in this alliance is open to continuous with an herb layer generally less than 3 m tall. Approximately 23.09 acres of upland mustards is present

within the Project area. This alliance occurs throughout the Project area but is more concentrated in the percolation basins on the northeastern side of the Project Area. This alliance is the most dominant nonnative alliance cover within the Project area.

Conium maculatum* Herbaceous Semi-Natural Alliance – 30 % *Lepidium latifolium

This alliance generally occurs between 0 and 3,280 feet and is found in all topography types including wetlands. In this alliance, poison hemlock, sweet fennel (*Foeniculum vulgare*), or another nonnative invasive plant of the family *Apiaceae* is dominant or co-dominant. Other nonnative plants are also present in the herbaceous layer and emergent trees and shrubs may be present at low cover. This alliance is dominated by nonnative, invasive plants. The canopy in this alliance is open to continuous with an herb layer generally less than 2 m tall. Approximately 6.23 acres of *Conium maculatum* Herbaceous Semi-Natural Alliance is present within the Project area and approximately 30 percent of the areas covered by this alliance support an understory dominated by perennial pepperweed. This alliance is present in small patches within the Project area adjacent to areas containing mulefat thickets and black willow thickets.

***Lepidium latifolium* – *Conium maculatum* Semi-Natural Herbaceous Stand – Poison Hemlock – Perennial Pepperweed Patches (Unofficial Alliance)**

This alliance is not listed in *A Manual of California Vegetation*, 2nd Edition. Rather, it is an amalgam of two nonnative alliances from the manual, *Lepidium latifolium* Semi-Natural Herbaceous Stands and *Conium maculatum-Foeniculum vulgare* Semi-Natural Herbaceous Stands. This unofficial alliance was identified to best describe the areas where perennial pepperweed and poison hemlock are co-dominant in the Project area and it refers to that site only. A low cover of emergent trees, eucalyptus trees (*Eucalyptus* spp.), and shrubs also occur within this alliance, as well as other invasive annuals. Approximately 13.28 acres of this alliance is present within the Project area. This combination land cover type occurs in both the upland and riparian corridor topographies on site and is concentrated in the central and western portions of the site where it is surrounded by the black willow thickets and the mulefat thickets.

***Lepidium latifolium* Herbaceous Semi-Natural Alliance – Perennial Pepperweed Patches**

This alliance generally occurs between 0 and 6,233 feet and is found within intermittently and seasonally flooded fresh and saltwater marshes and riparian corridors. In this alliance, perennial pepperweed is dominant in the herbaceous layer with emergent trees and shrubs that may be present at low cover. This alliance is dominated by nonnative, invasive plants. The canopy in this alliance is intermittent to continuous with an herb layer generally less than 2 m tall. Approximately 1.80 acres of monotypic perennial pepperweed patches is present in the western portion of the Project area adjacent to areas containing mulefat thickets and black willow thickets.

***Rumex crispus* Herbaceous Semi-Natural Alliance – Curly Dock Patches (Unofficial Alliance)**

This alliance is not listed in *A Manual of California Vegetation*, 2nd Edition. Curly dock patches is an unofficial alliance to best describe the areas where nonnative curly dock (*Rumex crispus*) seasonally dominates and it refers to this site within the Project area only. This alliance only occurs in a 0.3 acre small, depression area in the old mining pit in the western portion of the site. The old mining pit receives

precipitation and urban run-off and may remain inundated for extended periods. As the water soaks into the ground, the curly dock begins to grow and by the time the water has dried up completely, the entire depression becomes vegetated with this nonnative plant species. The depression in the mining pit where the curly dock occurs is mostly surrounded by the black willow thickets on site.

***Xanthium strumarium* Herbaceous Alliance – Cocklebur Patches (Unofficial Alliance)**

This alliance is not listed in *A Manual of California Vegetation*, 2nd Edition. It is a modification of the existing alliance from that reference called *Persicaria lapathifolia - Xanthium strumarium* Provisional Herbaceous Alliance. The official alliance is characterized by rough cocklebur or other knotwood species being dominant or co-dominant in the herbaceous layer with other herbaceous species including Devil's beggartick (*Bidens frondosa*), five angled dodder (*Cuscutta pentagona*), barnyard grass (*Echinochloa* spp.), and common spikerush (*Ecleocharis marostachya*). The unofficial alliance occurs in areas in the Project area where rough cocklebur dominates on a seasonal basis and it refers to this site only. This unofficial alliance occupies approximately 1.50 acres along the frequently flooded stream terraces closest to the dam where the soils are typically clay-rich or silty.

***Eucalyptus (globulus, camaldulensis)* Woodland Semi-Natural Alliance – Eucalyptus Groves**

This alliance generally occurs between 0 and 984 feet and is typically planted as trees, groves, and windbreaks and may become naturalized in uplands and along stream courses. In this alliance, red gum (*Eucalyptus camaldulensis*), blue gum (*E. globulus*), or other gum tree is dominant in the tree canopy. The canopy in this alliance is intermittent to continuous with trees typically less than 164 feet tall. The shrub layer and herbaceous layer are typically sparse to intermittent. Within the Project area, this alliance covers approximately 0.27-acre area near the dam. Nonnative grasses and forbs dominate the understory and the surrounding habitat is classified as disturbed. Eucalyptus trees are also common throughout the portions of the Project area but not in stands that would classify as an alliance.

***Fraxinus velutina* Forest Alliance - Velvet Ash Stands (Unofficial Alliance)**

This alliance is not listed in *A Manual of California Vegetation*, 2nd Edition. The unofficial *Fraxinus velutina* Forest Alliance best describes areas where velvet ash (*Fraxinus velutina*) trees were dominant. This alliance was identified in a 0.46-acre area in the northwestern corner of the Project area along the edge of the existing road. The small area is otherwise surrounded by the black willow thickets on site. Velvet ash also commonly occurs as individuals bordering the perimeter trail on the west side of the Project area.

Landscaped

The landscaped cover type refers to ornamental vegetation that does not exist in a natural state; rather the landscaped land cover type contains vegetation that has been planted and is regularly irrigated and maintained. A small 0.15-acre area along the southernmost edge of the Project area adjacent to Oak Grove Drive was classified as landscaped.

Depression/Bare Ground (Associated with Seasonally Wet Area)

The depression/bare ground land cover type refers to ground cover within two small areas in the central portion of the Project area that are associated with the seasonally wet areas. These two small areas have a combined area of 0.39 acres. They are seasonally inundated with water and, when dry, are generally bare or are sparsely vegetated.

Disturbed

The disturbed land cover type refers to areas where human activities have altered the environmental conditions in such a way that the natural vegetation community has been extirpated and the area is now bare of vegetation or supports a community of nonnative or ruderal plant species. Approximately 16.08 acres within the Project area were classified as the disturbed land cover type. This land cover type exists in the more highly disturbed habitats, in the basins on the eastern side of the Project area, and in the paved and dirt roads and trails.

2.4 Presence of Special Status Species

Past biological surveys in Devil's Gate Reservoir, where the mitigation areas are located, have documented the presence of migratory least Bell's vireo and southwestern willow flycatcher. Both of these species are federally and state-listed endangered species. No least Bell's vireo or southwestern willow flycatcher were detected during focused surveys in 2018 (ECORP 2018). Devil's Gate Reservoir is not within Designated Critical Habitat for least Bell's vireo, southwestern willow flycatcher, or coastal California gnatcatcher but does contain limited suitable habitat for the species.

2.5 Mitigation Site Compatibility with Multiple Uses

2.5.1 Trails and Human Influences

The mitigation areas are currently traversed by unofficial trails within Hahamongna Watershed Park used by hikers, equestrians, bird-watchers, joggers, nature lovers, and people walking their dogs. In general, these passive recreation activities do not create a lot of disturbance. Also, it appears that most of the activities are confined to the existing trails and due to the density of the vegetation in most areas, people generally don't venture far into the vegetation adjacent to the trails. However, loose dogs are present on a relatively frequent basis and they do cause additional disturbances when they venture off the trails and into the adjacent habitat. As part of the mitigation plan, LACFCD intends to close and control the use of the trails that cross through the mitigation areas to decrease the disturbances to the conserved habitat areas. The perimeter trail, an official trail around the reservoir, will remain open. The City has agreed that all unofficial trails through the reservoir can be closed as long as the perimeter trail remains open. The mitigation plan for the Project also includes narrowing portions of permanent trails, planting native barrier plants, such as cactus species, along trails to buffer sensitive habitat areas, placing woody debris at strategic locations in mitigation areas to increase functional value, removing trash, posting signs to identify the mitigation areas, and conducting educational outreach. Initially, closing trails will be a challenge but education and outreach will be conducted concurrently to promote awareness of the sensitivity of wildlife to the presence of people and dogs and the importance of conserving the habitat.

The site is open to homeless persons and homeless encampments have the potential to affect the quality of the mitigation areas. Pasadena Police Department (PPD) has a Homeless Persons Policy (Policy 464) that addresses issues pertaining to homeless activity within the City's limits. Specifically, Policy 464.6 addresses impacts to the ecology and natural resources of the City. Regular patrols by PPD will address issues pertaining to homeless persons and encampments in the mitigation areas. The City has an ordinance pertaining to homeless issues, which is found in Chapter 3.24.110 of the Title 3 of the City's Municipal Code. Furthermore, the Project area is regularly monitored by the LACFCD Dam Operator (DO) and Assistant DOs, who can assist in identifying and addressing issues pertaining to homeless persons and encampments in the mitigation areas.

2.5.2 Existing Easements

The mitigation areas for the Project are crossed by transmission, water, and gas utility easements where maintenance activities may be conducted periodically. The easements are shown on Figure 2-3 and the acreage of the easements located within each mitigation area are listed in Table 3. The total area encompassed by the mitigation areas and sides slopes is 79.45 acres, which includes the 2.71 acres encompassed by the easements. The acres within each of the mitigation areas minus the easement acreages are listed in the last column of Table 3. Since the CDFW cannot authorize mitigation credit for areas within utility easements, the total acreage of the compensatory mitigation minus the easements is 76.73 acres. Each of the easements are described below.

- Southern California Edison maintains overhead lines along the western and northeastern edges of the mitigation areas and over four mitigation areas (DG-1, DG-4, DG-4A, DG-9). The mitigation areas are not anticipated to conflict with Southern California Edison's tree trimming requirements. However, individual trees may need to be trimmed in some cases to comply with Southern California Edison's requirements.
- Pasadena Water and Power maintains an overhead line along the eastern portion of the mitigation areas and over four mitigation areas (DG-1, DG-4, DG-7, DG-9). The mitigation areas are not anticipated to conflict with Pasadena Water and Power's tree trimming requirements. However, individual trees may need to be trimmed in some cases to comply with Pasadena Water and Power requirements. For the purposes of the mitigation area planting plans, the areas near the easements will be planted with lower growing vegetation rather than large trees to avoid the potential of any impacts to the habitats in the mitigation area.
- The City has an easement containing one water line, a 12" galvanized steel standard screw end line, within the Project boundary. The easement is not expected to affect mitigation efforts. However, should maintenance be required within the easement, mitigation efforts may be temporarily impacted. The easement includes the areas within 25 feet of each side of the centerline of the water line (assume 50 feet total width).

Location: N:\2014\2014-003.008 Devils Gate Mitigation Plan\MAPS\meeting_maps_and_analysis\2018-04-10_Easements\DG_Easements_20180731.mxd (MAG) mgudry, 7/31/2018

Figure 2-3 Existing Easements Near Project

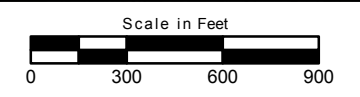
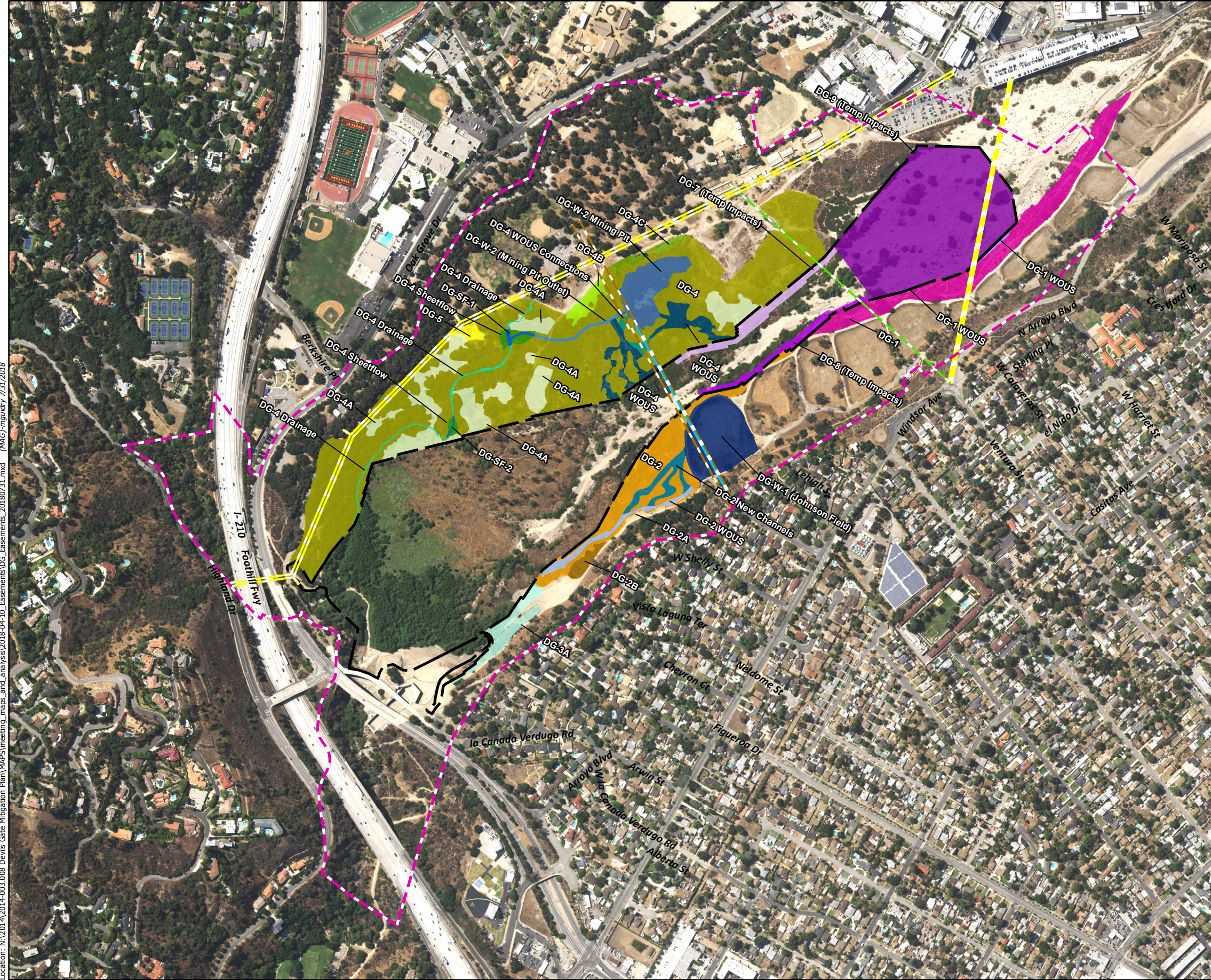
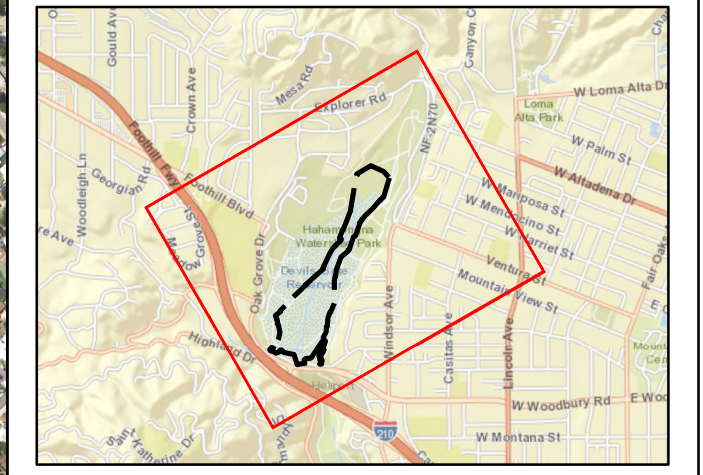
Map Features

- Project Footprint ¹
- Flood Control Easement ¹
- SCE Overhead Power Easement ¹
- PWP Overhead Power Line ¹
- Existing Gas Utility Easement ¹
- Existing Water Utility ¹

Mitigation Areas

<ul style="list-style-type: none"> DG-1 DG-1 WOUS DG-2 DG-2 New Channels DG-2 WOUS DG-2A DG-2B DG-3A DG-4 DG-4 Drainage DG-4 Sheetflow DG-4 WOUS DG-4 WOUS Connections 	<ul style="list-style-type: none"> DG-4A DG-4B DG-4C DG-5 DG-7 (Temp Impacts) DG-8 (Temp Impacts) DG-9 (Temp Impacts) DG-SF-1 DG-SF-2 DG-W-1 (Johnson Field) DG-W-2 (Mining Pit) DG-W-2 (Mining Pit Outlet)
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- Southern California Gas Company has an easement within the mitigation areas containing a 12-inch natural gas line. The easement occurs in the same general area as the City's 12" water line. The easement is not expected to affect mitigation efforts. However, should maintenance be required within the easement, mitigation efforts may be temporarily impacted. The easement includes the areas within 25 feet of each side of the centerline of the water line (assume 50 feet total width).
- Los Angeles County Sewer District has an easement which contains a sewer main along the southwestern edge of the mitigation areas. The easement is not expected to affect mitigation efforts as it located outside of the mitigation areas.

Table 3. Mitigation Areas and Utility Easement Acreages

Mitigation Area	Total Acreage	Acreage Within Easements	Total Acreage Without Easements
DG-1	4.88	0.13	4.75
DG-1 WOUS	0.11	0.00	0.11
DG-2	3.83	0.08	3.75
DG-2 New Channels	0.83	0.00	0.83
DG-2 WOUS	0.75	0.00	0.75
DG-2A	0.10	0.00	0.10
DG-2B	0.38	0.00	0.38
DG-3A	1.15	0.00	1.15
DG-4	28.40	1.33	27.07
DG-4 Drainage	0.49	0.00	0.49
DG-4 Sheetflow	0.40	0.00	0.40
DG-4 WOUS	1.88	0.04	1.84
DG-4 WOUS Connections	0.22	0.07	0.14*
DG-4A	5.46	0.03	5.42*
DG-4B	0.54	0.00	0.54
DG-4C	0.45	0.00	0.45
DG-5	0.26	0.00	0.25*
DG-7 (Temp Impacts)	1.16	0.01	1.15
DG-8 (Temp Impacts)	0.92	0.01	0.91
DG-9 (Temp Impacts)	14.09	0.27	13.82
DG-SF-1	0.08	0.00	0.08
DG-SF-2	0.03	0.00	0.03
DG-W-1 (Johnson Field)	3.44	0.43	3.01
DG-W-2 (Mining Pit)	2.13	0.14	1.98*
DG-W-2 Mining Pit Outlet	0.13	0.01	0.13*
Side Slopes	7.34	0.14	7.19
TOTAL	79.45	2.71	76.74

* The totals differ when columns are added due to rounding.

3.0 COMPENSATORY MITIGATION

3.1 Onsite Compensatory Mitigation

Onsite creation, restoration, and enhancement of riparian habitats, RAFSS, oak riparian, and upland buffer habitat will be the methods used to provide compensatory mitigation for permanent and temporary impacts of the Project on stream habitat. The onsite compensatory mitigation will be implemented concurrently with Project implementation to minimize temporal loss of habitat. The onsite mitigation areas are all located within the HWM for the Project (Figure 2-1). The total onsite compensatory mitigation package (76.73 acres not including the easements) proposed to offset the impacts of the Project includes conducting habitat restoration activities on approximately 69.54 acres located outside of the Permanent Maintenance Area and 7.19 acres on the side slopes in the EPM. Table 4 lists acres of each of the vegetation communities that will be created, restored, and enhanced to fulfill the onsite compensatory mitigation requirements.

Table 4. Onsite Compensatory Mitigation for Permanent and Temporary Impacts				
Vegetation Communities	Creation	Restoration	Enhancement- Restoration	Total
Onsite Compensatory Mitigation for Permanent Impacts				
Salix gooddingii Woodland Alliance	7.40	4.57	16.56	28.53
Baccharis salicifolia Shrubland Alliance	3.42	0.60	11.97	15.99
Lepidospartum squamatum Shrubland Alliance/Baccharis salicifolia Shrubland Alliance	0.00	0.00	0.00	0.00
Artemisia californica - Eriogonum fasciculatum Shrubland Alliance	0.00	0.00	3.13	3.13
Eriogonum facsciculatum Shrubland Alliance/Lepidospartum squamatum Shrubland Alliance	0.00	0.00	4.86	4.86
Quercus agrifolia Woodland Alliance/Baccharis salicifolia Shrubland Alliance	0.00	0.00	1.15	1.15
TOTAL ONSITE COMPENSATORY MITIGATION FOR PERMANENT IMPACTS	10.80	5.17	37.67	53.64
Onsite Compensatory Mitigation for Temporary Impacts				
Salix gooddingii Woodland Alliance	0.00	0.70	0.00	0.70
Baccharis salicifolia Shrubland Alliance	0.00	1.36	0.00	1.36
Lepidospartum squamatum Shrubland Alliance/Baccharis salicifolia Shrubland Alliance	0.00	13.82	0.00	13.82
TOTAL ONSITE COMPENSATORY MITIGATION FOR TEMPORARY IMPACTS	0.00	15.88	0.00	15.88
Onsite Compensatory Mitigation – Side Slopes				
Lepidospartum squamatum Shrubland Alliance/Baccharis salicifolia Shrubland Alliance	0.00	0.00	7.19	7.19
TOTAL ONSITE COMPENSATORY MITIGATION – SIDE SLOPES	0.00	0.00	7.19	7.19
TOTAL ONSITE COMPENSATORY MITIGATION	10.80	21.05	44.86	76.73

Figure 3-1 shows the anticipated post-Project distribution of vegetation communities within the mitigation areas. Table 5 lists the anticipated post-Project acreages of the various plant communities, including the easement areas. Improvements will result from the removal of nonnative and invasive plant species, closing of trails and actively managing human access through the use of trail designations and public outreach, and restoration of a multi-structured riparian canopy and understory.

At present, very little of the habitat in the reservoir is suitable for listed species of birds because of the abundance of invasive and nonnative plants present and a lack of structural diversity that is preferred by the species. Improving the existing habitat and the restoration of additional habitat will provide higher quality habitat that can support an abundant population of least Bell's vireos and potentially support southwestern willow flycatchers (*Empidonax traillii extimus*), western yellow-billed cuckoos (*Coccyzus americanus*), and other sensitive species while also providing an important migration stopover and wildlife movement corridor in a highly urbanized area. Additional measures that will be implemented to reduce impacts and increase function in the mitigation areas will be closure of unnecessary trails, planting of native barrier plants, such as poison oak (*Toxicodendron diversilobum*) or prickly-pear cactus (*Opuntia littoralis*), in buffers adjacent to permanent trails, and placement of woody debris to increase structural diversity and to provide additional refugia for wildlife and catchment sites for plant seeds. Barrier plants will create a buffer between sensitive habitat and recreational trails to prevent human access into the mitigation areas. An ongoing weed and invasive plant management program will ensure the habitat won't become degraded and will remain a functional habitat area for the long-term.









Vegetation Community	Riparian	Upland	Upstream RAFSS	Side Slopes	Total
<i>Artemisia californica</i> – <i>Eriogonum fasciculatum</i> Shrubland Alliance	0.00	3.27	0.00	0.00	3.27
<i>Eriogonum fasciculatum</i> Shrubland Alliance/ <i>Lepidospartum squamatum</i> Shrubland Alliance	0.00	4.99	0.00	0.00	4.99
<i>Lepidospartum squamatum</i> Shrubland Alliance/ <i>Baccharis salicifolia</i> Shrubland Alliance	0.00	0.00	14.09	7.34	21.43
<i>Quercus agrifolia</i> Woodland Alliance	0.00	1.15	0.00	0.00	1.15
<i>Baccharis salicifolia</i> Shrubland Alliance	17.87	0.00	0.00	0.00	17.87
<i>Salix gooddingii</i> Woodland Alliance	30.75	0.00	0.00	0.00	30.75
TOTAL	48.62	9.41	14.09	7.34	79.46

*Rounding accounts for any differences in the total of the vegetation communities in other parts of the HRP

Table 6 lists each of the mitigation areas, the target vegetation communities, the mitigation method, and the acres encompassed by each mitigation area used to offset the impacts to stream habitat. The proposed compensatory mitigation also includes the creation, restoration, and enhancement of approximately 54.34 acres of riparian and upland habitats and 7.19 acres of side slope buffer habitat. In addition, approximately 15.88 acres of riparian and RAFSS habitats in the temporary impact areas will be restored following the completion of the sediment removal phase of the Project.

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Figure 3-1 Anticipated Post-Restoration Vegetation Communities

- Map Features**
-  Initial Sediment Removal Footprint ¹
 -  Permanent Maintenance Footprint ¹
- Post-Construction Vegetation**
-  Artemisia californica - Eriogonum fasciculatum Shrubland Alliance (AcEfsA)
 -  Baccharis salicifolia Shrubland Alliance (BssA)
 -  Eriogonum fasciculatum Shrubland Alliance / Lepidospartum squamatum Shrubland Alliance (EfsA/LsSA)
 -  Lepidospartum squamatum Shrubland Alliance/ Baccharis salicifolia Shrubland Alliance (LsSA/BsSA)
 -  Quercus agrifolia Woodland Alliance (QaWA)
 -  Salix gooddingii Woodland Alliance (SgWA)



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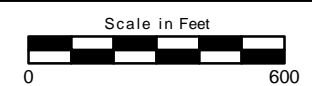


Table 6. Onsite Mitigation Area Descriptions

Site #	Target Vegetation Type	Mitigation Method	Acres
DG-W-2 (Mining Pit)	<i>Salix gooddingii</i> Woodland Alliance	Restoration	1.98
DG-W-2 (Mining Pit Outlet)	<i>Salix gooddingii</i> Woodland Alliance	Creation	0.13
DG-SF-1 (Part of DG-4 Drainage)	<i>Salix gooddingii</i> Woodland Alliance	Restoration	0.08
DG-SF-2 (Part of DG-4 Drainage)	<i>Salix gooddingii</i> Woodland Alliance	Restoration	0.03
DG-W-1 (Johnson Field)	<i>Salix gooddingii</i> Woodland Alliance	Creation	3.01
DG-2 New Channels	<i>Salix gooddingii</i> Woodland Alliance	Creation	0.83
DG-2 WOUS	<i>Salix gooddingii</i> Woodland Alliance	Restoration	0.75
DG-4-Drainage	<i>Salix gooddingii</i> Woodland Alliance	Restoration	0.49
DG-4-Sheet Flow	<i>Salix gooddingii</i> Woodland Alliance <i>Baccharis salicifolia</i> Shrubland Alliance	Enhancement	0.35 0.05
DG-4-WOUS	<i>Salix gooddingii</i> Woodland Alliance <i>Baccharis salicifolia</i> Shrubland Alliance	Restoration	1.24 0.60
DG-4-WOUS Connections	<i>Salix gooddingii</i> Woodland Alliance	Creation	0.14
DG-1-WOUS	<i>Lepidospartum squamatum</i> Shrubland Alliance/ <i>Baccharis salicifolia</i> Shrubland Alliance	Enhancement	0.11
DG-2	<i>Salix gooddingii</i> Woodland Alliance <i>Baccharis salicifolia</i> Shrubland Alliance	Enhancement	0.22 3.53
DG-2A	<i>Baccharis salicifolia</i> Shrubland Alliance	Creation	0.10
DG-2B	<i>Baccharis salicifolia</i> Shrubland Alliance	Creation	0.38
DG-3A	<i>Quercus agrifolia</i> Woodland Alliance/ <i>Baccharis salicifolia</i> Shrubland Alliance	Enhancement	1.15
DG-4	<i>Salix gooddingii</i> Woodland Alliance <i>Baccharis salicifolia</i> Shrubland Alliance <i>Artemisia californica-Eriogonum fasciculatum</i> Shrubland Alliance	Enhancement	15.84 8.04 3.13
DG-4A	<i>Salix gooddingii</i> Woodland Alliance <i>Baccharis salicifolia</i> Shrubland Alliance	Creation	3.02 2.41
DG-4B	<i>Baccharis salicifolia</i> Shrubland Alliance	Creation	0.54
DG-4C	<i>Salix gooddingii</i> Woodland Alliance <i>Baccharis salicifolia</i> Shrubland Alliance	Enhancement	0.10 0.35
DG-5	<i>Salix gooddingii</i> Woodland Alliance	Creation	0.26
DG-1	<i>Eriogonum fasciculatum</i> Shrubland Alliance/ <i>Lepidospartum squamatum</i> Shrubland Alliance	Enhancement	4.75
DG-7	<i>Salix gooddingii</i> Woodland Alliance <i>Baccharis salicifolia</i> Shrubland Alliance	Restoration	0.70 0.45
DG-8	<i>Baccharis salicifolia</i> Shrubland Alliance	Restoration	0.91
DG-9	<i>Lepidospartum squamatum</i> Shrubland Alliance/ <i>Baccharis salicifolia</i> Shrubland Alliance	Restoration	13.82
Side Slopes	<i>Lepidospartum squamatum</i> Shrubland Alliance/ <i>Baccharis salicifolia</i> Shrubland Alliance	Enhancement	7.19

3.2 Tree Mitigation

Per condition 2.11 in the LSAA, a qualified biologist will conduct an oak tree inventory for all the native oak trees that will be removed or impacted during Project activities prior to the start of ground disturbing activities. Data collected during the survey will include tree tag number, species, diameter at breast height (DBH), dripline radius, structure, height, condition, and transplantability. Based on the mitigation requirement in the LSAA, native oak trees removed or impacted during Project activities will be replaced based on canopy acreage. The acreage replacement ratio will be no less than 1:1.

Per Mitigation Measure (MM) BIO-7 in the Final Environmental Impact Report (FEIR), a qualified biologist will conduct a tree survey to document the canopy acreage of all the trees protected under the City of Pasadena Code of Ordinances. Trees protected under the Ordinance include coast live oak, Engelmann oak (*Quercus engelmannii*), canyon oak (*Quercus chrysolepis*), California sycamore, Southern California black walnut, scrub oak (*Quercus berberidifolia*), valley oak, California bay, Fremont's cottonwood, white alder, black cottonwood (*Populus trichocarpa*), arroyo willow, and California buckeye (*Aesculus californica*) (City of Pasadena 2018). Based on the mitigation requirement in the FEIR, protected trees removed or impacted during Project activities will be replaced based on canopy acreage. The acreage replacement ratio will be no less than 1:1.

The exact mitigation acreage and number of trees to be planted will be based on the results of the oak tree inventory and protected tree survey.

3.3 Measures Designed to Create a Beneficial Impact

The Project area and the associated mitigation areas are encompassed by the Hahamongna Watershed Park, which is heavily used for recreational types of activities, such as hiking, bird watching, horseback riding, and other assorted outdoor activities. As a result, the area is crossed by numerous unofficial trails and exhibits evidence of human use (e.g., trash, structures, and damage to natural resources). The mitigation strategy for the Project includes measures designed to reduce the impacts of human presence on the mitigation areas and to protect the wildlife that reside in the habitats, including listed species. The measures include closures of unnecessary trails, narrowing of some of the permanent trails, planting of native barrier plants along trails to buffer sensitive habitat areas, placing woody debris at strategic locations in mitigation areas to increase functional value, removing trash, and conducting educational outreach. These measures in combination with the habitat restoration activities will greatly increase the function and the amount of suitable habitat for sensitive and listed species of wildlife.

4.0 MITIGATION WORK PLAN

4.1 Responsible Parties

4.1.1 Restoration Ecologist

The Restoration Ecologist (RE), as appointed by LACFCD, shall be responsible for monitoring the compensatory mitigation areas to ensure Project activities are completed according to the guidelines set forth in this plan and applicable permits. The RE shall be familiar with all aspects of habitat restoration and native habitats within southern California. The duties of the RE shall include overseeing all aspects of work

performed by the Restoration Contractor. In addition, the RE shall have the responsibility of documenting and reporting the progress of the developing riparian community to LACFCD and regulatory agencies, as well as making recommendations on how to meet established performance standards. If necessary, the RE may also prescribe remedial measures.

4.1.2 Restoration Contractor

The Restoration Contractor (RC) responsible for the habitat mitigation implementation and maintenance shall have successfully completed (with documented agency acceptance) a minimum of three mitigation projects (installation and maintenance) involving the installation and maintenance of successful riparian and upland habitats that are comparable to this Project in terms of size, complexity, and species composition. The RC shall provide at least one English-speaking person who is experienced with all aspects of habitat restoration and thoroughly familiar with all aspects of the Project, including equipment and materials being utilized or installed and the best methods for their installation and application. This person shall be present at all times during the completion of this work and shall direct and supervise all work specified herein. The foreman for the RC shall be on site no less than 90 percent of the time that crews are working.

4.1.3 Los Angeles County Flood Control District

The LACFCD is ultimately responsible for the success of the mitigation areas. If the mitigation areas are not performing well and are not trending towards meeting the required performance standards, the adaptive management techniques described in Section 8.0 of this plan will be employed. LACFCD will be the land manager of the mitigation areas throughout the duration of the implementation of the HRP. Once the mitigation areas achieve the performance standards, the management will be governed by the measures outlined in the Habitat Management Plan (HMP) prepared for the Project. LACFCD will be the land manager responsible for implementing the HMP because the mitigation areas are located within the flood control easement for Devil's Gate Reservoir.

4.2 Description of Mitigation Areas

This section of the HRP provides descriptions of each of the mitigation areas, the temporary impact areas, and the side slopes of the PMA and the corresponding activities that will be conducted to improve the habitats and functions in each area. The mitigation areas were originally named to correspond with the compensatory mitigation required by the USACE. For consistency purposes, these names will be kept the same in this HRP.

Figure 2-1 shows the locations of each of the mitigation areas and Table 7 summarizes the activities that will be conducted in each of the mitigation areas. The acreages listed in Table 7 for the mitigation areas correspond to the initial acreage of the mitigation areas minus the utility easement acreages. However, the total acreage of each mitigation area, including the easement acreage, is also listed in parenthesis. The mitigation areas include riparian and upland habitats, including RAFSS and riparian oak woodland habitats. The temporary impact areas and the side slopes of the Permanent Maintenance Area, which will be restored with RAFSS and riparian scrub habitats are also described below. The buffer habitats, the replacement of the habitats in the temporary impact areas, and the planting of vegetation on the side

slopes are all important because these native habitats will augment the overall function of the wildlife habitat in Devil's Gate Reservoir.

Appendix A includes the conceptual design plans for the mitigation areas. The final design plans, which are in the process of being prepared, will be included in the As-built report that will be prepared following the implementation of the restoration activities in the mitigation areas.

Table 7. Restoration Activities Descriptions for the Onsite Mitigation Areas			
Site Description	Mitigation Method	Acreage*	Planned Activities Conducted in the Onsite Mitigation Areas
Riparian Habitat			
DG-W-2 (Mining Pit)	Restoration	1.98 (2.13*)	<ul style="list-style-type: none"> • Planting and seeding with native riparian species. • Recontour existing soil in select areas to improve conveyance of flows during inclement weather. • Recontour existing soil in select areas to improve distribution of water throughout mitigation area. • Recontour and homogenize existing soil in select areas to improve soil conditions to support riparian trees. • Improve hydrology so that connection with DG-W-2 (Outlet) and existing non-wetland WOUS in DG-4 occurs. • Remove nonnative/invasive plant species from the mitigation area. • Estimated volume of soil to be manipulated throughout mitigation area is 4,000 cubic yards (cu yd). • Estimated area where soil manipulation will occur is 1.3 acres (ac). • Neither import nor export of soil is anticipated.
DG-W-2 (Mining Pit Outlet)	Creation	0.13 (0.13*)	<ul style="list-style-type: none"> • Planting and seeding with native riparian species. • Recontour existing soil to improve conveyance of flows during inclement weather. • Recontour existing soil to improve distribution of water throughout mitigation area. • Recontour and homogenize soil to improve soil conditions to support riparian trees. • Improve hydrology so that DW-W-2 can convey flows to DG-4 (Drainage). • Remove nonnative/invasive plant species from the mitigation area. • Estimated volume of soil to be manipulated throughout mitigation area is 260.0 cu yd. • Neither import nor export of soil is anticipated.
DG-SF-1 (Part of DG-4 Drainage)	Restoration	0.08 (0.08*)	<ul style="list-style-type: none"> • Planting and seeding with native riparian species. • Recontour existing soil to improve conveyance of flows during inclement weather. • Recontour existing soil to improve distribution of water throughout mitigation area. • Recontour and homogenize soil to improve soil conditions to support riparian trees. • Remove nonnative/invasive plant species from the mitigation area. • Estimated volume of soil to be manipulated throughout mitigation area is 31.0 cu yd. • Neither import nor export of soil is anticipated.

Table 7. Restoration Activities Descriptions for the Onsite Mitigation Areas			
Site Description	Mitigation Method	Acreage*	Planned Activities Conducted in the Onsite Mitigation Areas
DG-SF-2 (Part of DG-4 Drainage)	Restoration	0.03 (0.03*)	<ul style="list-style-type: none"> Planting and seeding with native riparian species. Recontour existing soil to improve conveyance of flows during inclement weather. Recontour existing soil to improve distribution of water throughout mitigation area. Recontour and homogenize soil to improve soil conditions to support riparian trees. Remove nonnative/invasive plant species from the mitigation area. Estimated volume of soil to be manipulated throughout mitigation area is 10.0 cu yd. Neither import nor export of soil is anticipated.
DG-W-1 (Johnson Field)	Creation	3.01 (3.44*)	<ul style="list-style-type: none"> Planting and seeding with native riparian species. Recontour existing soil to improve conveyance of flows during inclement weather. Recontour existing soil to improve distribution of water throughout mitigation area. Recontour and homogenize soil to improve soil conditions to support riparian trees. Improve hydrology so that DG-W-1 can convey flows to DG-2 and DG-2 non-wetland WOUS. Remove nonnative/invasive plant species from the mitigation area. Export of soil will occur with a total estimated volume of 34,287 cu yd.
DG-2 New Channels	Creation	0.83 (0.83*)	<ul style="list-style-type: none"> Planting and seeding with native riparian species. Recontour existing soil to improve conveyance of flows during inclement weather. Recontour existing soil to improve distribution of water throughout mitigation area. Recontour and homogenize soil to improve soil conditions to support riparian trees. Improve hydrology so that DG-W-1 can convey flows to DG-2. Remove nonnative/invasive plant species from the mitigation area. Estimated volume of soil to be manipulated throughout mitigation area is 540.0 cu yd. Neither import nor export of soil is anticipated.
DG-2 WOUS	Restoration	0.75 (0.75*)	<ul style="list-style-type: none"> Planting and seeding with native riparian species. Recontour existing soil in select locations to improve conveyance of flows during inclement weather. Improve hydrology so that DG-W-1 can convey flows to the Reservoir. Remove nonnative/invasive plant species from the mitigation area. Neither import nor export of soil is anticipated.

Table 7. Restoration Activities Descriptions for the Onsite Mitigation Areas			
Site Description	Mitigation Method	Acreage*	Planned Activities Conducted in the Onsite Mitigation Areas
DG-4-Drainage	Restoration	0.49 (0.49*)	<ul style="list-style-type: none"> Planting and seeding with native riparian species. Recontour existing soil to improve conveyance of flows during inclement weather. Remove nonnative/invasive plant species from the mitigation area. Estimated volume of soil to be manipulated throughout mitigation area is 20.0 cu yd. Neither import nor export of soil is anticipated.
DG-4-Sheet Flow	Enhancement	0.40 (0.40*)	<ul style="list-style-type: none"> Planting and seeding with native riparian species. Remove nonnative/invasive plant species from the mitigation area. Neither import nor export of soil is anticipated.
DG-4-WOUS	Restoration	1.84 (1.88*)	<ul style="list-style-type: none"> Planting and seeding with native riparian species. Remove nonnative/invasive plant species from the mitigation area. Neither import nor export of soil is anticipated.
DG-4-WOUS Connections	Creation	0.14 (0.22*)	<ul style="list-style-type: none"> Planting and seeding with native riparian species. Recontour existing soil to improve conveyance of flows during inclement weather. Recontour existing soil to improve distribution of water throughout mitigation area. Improve hydrology so that DG-W-2 can convey flows to non-wetland WOUS in DG-4. Improve hydrology so that a connection is established between two areas of non-wetland WOUS in DG-4. Remove nonnative/invasive plant species from the mitigation area. Estimated volume of soil to be manipulated throughout mitigation area is 20.0 cu yd. Neither import nor export of soil is anticipated.
DG-1-WOUS	Enhancement	0.11 (0.11*)	<ul style="list-style-type: none"> Planting and seeding with native riparian species. Remove nonnative/invasive plant species from the mitigation area.
DG-2	Enhancement	3.75 (3.83*)	<ul style="list-style-type: none"> Planting and seeding with native riparian species. Remove nonnative/invasive plant species from the mitigation area.
DG-2A	Creation	0.10 (0.10*)	<ul style="list-style-type: none"> Planting and seeding with native species. Remove nonnative/invasive plant species from the mitigation area.
DG-2B	Creation	0.38 (0.38*)	<ul style="list-style-type: none"> Planting and seeding with native species. Remove nonnative/invasive plant species from the mitigation area.
DG-3A	Enhancement	1.15 (1.15*)	<ul style="list-style-type: none"> Planting and seeding with native riparian (and oak) species. Remove nonnative/invasive plant species from the mitigation area.
DG-4	Enhancement	27.07 (28.40*)	<ul style="list-style-type: none"> Planting and seeding with native riparian species. Removal of nonnatives and seeding with CSS in 3.27 acres Remove nonnative/invasive plant species from the mitigation area.

Table 7. Restoration Activities Descriptions for the Onsite Mitigation Areas			
Site Description	Mitigation Method	Acreage*	Planned Activities Conducted in the Onsite Mitigation Areas
DG-4A	Creation	5.42 (5.46*)	<ul style="list-style-type: none"> Planting and seeding with native riparian species. Recontour existing soil to improve distribution of water throughout mitigation area. Remove nonnative/invasive plant species from the mitigation area. Neither import nor export of soil is anticipated.
DG-4B	Creation	0.54 (0.54*)	<ul style="list-style-type: none"> Planting and seeding with native riparian species. Remove nonnative/invasive plant species from the mitigation area.
DG-4C	Enhancement	0.45 (0.45*)	<ul style="list-style-type: none"> Planting and seeding with native riparian species. Remove nonnative/invasive plant species from the mitigation area.
DG-5	Creation	0.25 (0.26*)	<ul style="list-style-type: none"> Planting and seeding with native riparian species. Recontour existing soil to improve distribution of water throughout mitigation area. Recontour and homogenize soil to improve soil conditions to support riparian trees. Remove nonnative/invasive plant species from the mitigation area. Neither import nor export of soil is anticipated.
TOTAL RIPARIAN HABITAT		48.90 (51.06*)	
<i>Upland Habitat</i>			
DG-1	Enhancement	4.75 (4.88*)	<ul style="list-style-type: none"> Planting and seeding with native species. Remove nonnative/invasive plant species from the mitigation area.
TOTAL NON-AQUATIC BUFFERS		4.75 (4.88*)	
Side Slope Buffers			
Side Slopes	Enhancement	7.19 (7.34*)	<ul style="list-style-type: none"> Planting and seeding with native species.
TOTAL SIDE SLOPE BUFFERS		7.19 (7.34*)	
Temporary Impact Areas			
DG-7	Restoration	1.15 (1.16*)	<ul style="list-style-type: none"> Planting and seeding with native riparian species. Remove nonnative/invasive plant species from the mitigation area.
DG-8	Restoration	0.91 (0.92*)	<ul style="list-style-type: none"> Planting and seeding with native riparian species. Remove nonnative/invasive plant species from the mitigation area.
DG-9	Restoration	13.82 (14.09*)	<ul style="list-style-type: none"> Planting and seeding with native riparian species. Remove nonnative/invasive plant species from the mitigation area.
TOTAL TEMPORARY IMPACT AREAS		15.88 (16.17*)	
GRAND TOTAL MITIGATION AREAS AND SIDE SLOPES		76.72 (79.45*)	

* Acreage in parenthesis is the mitigation area including the easements

4.2.1 Riparian Compensatory Mitigation Areas

DG-W-2 (Restoration)

DG-W-2 is a 1.98-acre (2.13 acres including the easements) area on the west side of the Reservoir. The area is located within a topographic depression that was created when the area was historically mined. This area has a history of inundation following storm events, which is evident in historic aerial photographs. In addition to inundation, the former mining pit receives sheet flows from the Oak Grove Area of Hahamongna Watershed Park through a culvert under the road located to the west of the former mining pit. Stream flows also historically entered the pit from the east during high flows as evidenced by the presence of a sheet flow area located east of the pit.

DG-W-2 currently supports vegetation that is typical of both wetland and riparian habitat. Vegetation within this area is a mix of the nonnative, invasive curly dock (*Rumex crispus*) in areas with high clay content, surrounded by thickets of mulefat and black willow in areas where soil appeared to be higher sand content. Black willow thickets have willows ranging from approximately 10 to 20 feet in height with trunks having diameter at breast height of four to six inches. The area closest to the existing culvert outlet (on western bank) has a prevalence of accumulated soils that seem to range in texture from sand, silty sand, silty clay, clay loam, to sandy loam (determined by visual examination, texture analysis was not performed). Much of this accumulated soil has likely been deposited into this area during storm events. Excavations into the soil profile (by-hand) revealed that accumulated sediments with clays and silts may only be present within the first 12 to 18 inches of soil. Adjacent vegetation communities include disturbed California sagebrush/buckwheat scrub to the north, riparian woodland/mulefat thickets to the south and east and developed areas to the west. Any surface water that flows from DG-W-2 exits to the south and when it encounters a heavily used trail, it is diverted to the south as evidenced by multiple sheet flow channels running east towards the main stream channel of the Reservoir. Evidence of inundation from the south is also present, which is likely a result of Reservoir filling during heavy storms.

The mitigation objective for DG-W-2 is the restoration of riparian woodland and mulefat thicket vegetation communities. Nonnative, invasive plants will be removed, and the accumulated sediment and the existing berms left over from former mining activities will be re-contoured. Debris and unwanted materials will be removed to improve the overall aquatic function of the area. Existing native plants will be avoided to the extent possible during the sediment removal and re-contouring activities. Select areas of DG-W-2 will be graded lower in elevation than the riparian woodland/mulefat thickets in order to convey storm flows to the south in two channels through the mining pit and to connect these with a channel that will convey storm flows further south into DG-W-2 (Mining Pit Outlet). If the mitigation area harbors any standing water during the wet season it could become a breeding ground for mosquitos, in which case LACFCD will coordinate with the San Gabriel Valley Mosquito and Vector Control District to implement eradication efforts.

Although cattail/bulrush wetland mitigation is not a goal for DG-W-2, if this type of wetland habitat can be supported then the habitat restoration program will maintain these areas appropriately so that wetland vegetation will become well established and self-sustaining. Wetland vegetation will be planted as appropriate and the perimeter will be planted with willows and mulefat to form a multi-structured riparian

habitat. The post-Project condition of this mitigation area will be a higher functioning, multi-structured riparian woodland with mulefat thickets.

DG-W-1 (Johnson Field) (Creation)

DG-W-1 (Johnson Field) is a 3.01-acre (3.44 acres including the easements) non-operational percolation basin on the east side of the Project. Bounded by an elevated dirt maintenance road on all sides, most of the mitigation area currently consists of disturbed fill of varying grades of sediment and gravel from previous maintenance activities associated with the Interim Management Project to manage sediment behind Devil's Gate Dam. The disturbed portion of DG-W-1 is dominated by Mustard and Annual Brome Semi-Natural Herbaceous Stand vegetation communities. Other nonnatives present include tocalote (*Centaurea melitensis*), wild radish (*Hirschfeldia incana*), Italian thistle (*Carduus pycnocephalus*), and sparse occurrences of perennial pepperweed. Several escaped cultivars are present within and bordering DG-W-1 including palms (*Washingtonia robusta*) and large eucalyptus trees.

Review of historical aerials available on-line at HistoricAerials.com (2018) suggests that human impacts to the adjacent stream channel (just west of DG-W-1) were very minor up until the early 1960s. The series of approximately 13 percolation basins positioned immediately adjacent to and upstream of DG-W-1 have been used since at least the 1950s. Prior to 1970, the area that now comprises the entire DG-W-1 mitigation area had not been manipulated by humans (on-line aerials were reviewed starting in 1952). Aerial photos prior to 1977 suggest that the proposed DG-W-1 mitigation area was comprised of alluvial scrub sparsely vegetated with tree species or large shrubs.

In consideration of this information, the mitigation objective for DG-W-1 is creation of riparian woodland/southern willow scrub vegetation communities. The overall configuration of DG-W-1 is anticipated to be a rounded square (or oval) that is surrounded by the existing berm. The berm will be sloped 1:2 and the lowest portion of DG-W-1 will be a combination of irregularly shaped mounds that have dendritic inlets and uneven topography. Soils will be homogenized and amended as necessary following removal of a portion of the existing stockpiled soil. Decompaction will also occur to achieve a final compaction of 60 to 70 percent. Select areas will be graded to be lower in elevation in order to allow water to collect, and potentially support hydrophytic vegetation. Wetland mitigation is not a goal for DG-W-1, however if wetland habitat can be supported then the habitat restoration program will maintain these areas during the restoration program (e.g., minimizing invasion by nonnative plant species) so that native wetland vegetation can persist.

The maintenance road on the west and south sides of DG-W-1 will be re-contoured to have a sloped berm without a flattened top, and a 10-foot-wide channel will be cut at the southeastern corner of the basin so water can flow into DG-2 and percolate into the soil slowly through a series of channels set perpendicular to the flow path. There is an existing street drain (off of West Kent Street) that outflows at the southeastern corner of DG-W-1 (and into DG-2). This outlet pipe will be redirected at the toe-of-slope so that it instead flows into DG-W-1. There is an existing overflow pipe that allows for water to flow from DG-W-1 to the riparian scrub area just to the south; this will be removed when the flow-through channel is made. To allow water to enter DG-W-1 from the northwest corner, an approximately 2-foot-wide corrugated high-density polyethylene (HDPE) pipe will be installed at the northwestern corner of DG-W-1

at an approximate elevation of 1,035 feet so that if runoff from the San Gabriel Mountains backs-up in the main basin it can flow into DG-W-1. It is anticipated that this may occur for up to a 4- to 8-hour period during 2-year storm events.

DG-W-2 (Outlet) (Creation)

DG-W-2 (Outlet) is a 0.13-acre channel that will be re-contoured to extend from the southwest side of the former mining pit (DG-W-2) and to the south to DG-SF-1. The channel has been disconnected from DG-W-2 by a heavily used trail that causes flows to be diverted and conveyed eastward towards the main drainage channel. Currently, the area where the channel will be rehabilitated is vegetated with a patchy distribution of mulefat scrub and riparian woodland/scrub that is dominated by nonnative species. The understory of the existing habitat contains an abundance of perennial pepperweed and other nonnative plants, as well as, eucalyptus trees.

To improve the function of DG-W-2 and to return the historic flow path to the western portion of the Reservoir, a channel will be created. The location of where the channel historically exited the former mining pit will remain approximately the same. The channel will be created by closing the trail, removing sediment, and contouring the channel to convey natural flows from the former mining pit to the western portion of the Reservoir. The rehabilitated channel will be approximately 475 feet long and the width will be approximately four to 10 feet wide and generally two to four feet deep. Existing native plants will be avoided to the extent possible during contouring of the channel. Invasive and nonnative plants and weeds will be removed and willows and mulefat will be planted along the banks of the channel. In addition, areas immediately adjacent to the channel will be enhanced in the form of nonnative plant removal. The mitigation objective for DG-W-2 (Outlet) is the creation of a single stable outflow channel through the DG-4 enhancement area.

DG-SF-1 and DG-SF-2 (Restoration)

To improve the function of the existing non-wetland WOUS channel in the western portion of the Reservoir, two areas that currently exhibit a dispersed sheet flow will be rehabilitated to improve the function of the WOUS by returning the historic channel connections with the existing channel. The northernmost sheet flow area (DG-SF-1) encompasses approximately 0.08 acre. At the point where the outflow channel from the former mining pit (DG-W-2) enters DG-SF-1, the channel will be connected with the channels that enter from the Oak Grove area. This will provide for continuous conveyance of storm flows that proceed through the western portion of the Reservoir to Berkshire Creek. The southernmost sheet flow area (DG-SF-2) covers an area of approximately 0.03 acre. Re-contouring of this area will also provide for continuous conveyance of storm flows that originate from upstream in the Oak Grove Area and from the former mining pit, eventually outflowing into Berkshire Creek. Reconnecting the entire channel will more efficiently and more regularly convey storm flows through the habitat in the western portion of the Reservoir. Invasive and otherwise nonnative plants will be removed and willows and mulefat will be planted along the banks of the channel. The total acres of non-wetland WOUS channels that will be rehabilitated in the sheet flow areas is 0.11 (DG-SF-1 and DG-SF-2).

DG-2 New Channels (Creation)

DG-2 New Channels is a 0.83-acre network of channels that is planned to extend from DG-W-1 (Johnson Field) to DG-2-WOUS. The planned configuration will comprise three main channels that will flow from northwest to the southeast so that moisture can be distributed throughout a large portion of DG-2. The area where these channels will be formed is currently a mix of mulefat thickets and nonnative infestations of perennial pepperweed, poison hemlock, and other nonnative species. During formation of the channels avoidance of native plants will be achieved to the maximum extent practicable. Specifically, DG-2 New Channels will be re-contoured to improve conveyance of flows during inclement weather. In addition, soil manipulation during formation of channels will improve distribution of water throughout a large portion of DG-2 and improve soil conditions to support growth of riparian trees. Following removal of nonnative and invasive plant species, planting and seeding with native riparian trees and shrubs will occur so that black willow woodland can grow and persist and improve the hydrological function of this area.

DG-2 WOUS (Restoration)

DG-2 WOUS is a 0.75-acre channel within DG-2 that currently conveys flows from a storm drain that has an inlet at the terminus of West Kent Street. DG-2 WOUS will convey flows from DG-2 New Channels [and DG-W-1 (Johnson Field)] in a southerly direction until they will intersect with the side slope of the eastern margin of the Reservoir. DG-2 WOUS is currently a mix of mulefat thickets and nonnative infestations of perennial pepperweed, poison hemlock, and other nonnative species, with sparse occurrences of native riparian trees. During mitigation work in this channel avoidance of native plants will be achieved to the maximum extent practicable. Ultimately, the goal for DG-2 WOUS mitigation area is to restore the channel to native riparian plant communities.

Specifically, DG-2 WOUS will be re-contoured in select locations to improve conveyance of flows during inclement weather. In addition, soil manipulation will improve conveyance of water from DG-W-1 (Johnson Field) to the Reservoir. Following removal of nonnative and invasive plant species from DG-2 WOUS, planting and seeding with native riparian trees and shrubs will occur so that black willow woodland can grow and persist and improve the hydrological function of this area.

DG-4-Drainage (Restoration)

An existing non-wetlands WOUS channel extends through the DG-4 mitigation area and it appears that it had a historic connection with the channels extending from the Oak Grove area and the former mining pit (DG-W-2). As previously described for mitigation areas DG-W-2 (Outlet), DG-SF-1, and DG-SF-2, the historic channel connections were diverted into sheet flow areas or by trails at some point in the past. The existing 0.49-acre channel through DG-4 shows evidence of water flows, however, human impacts and debris have degraded this channel in some areas. Trash, concrete pieces, and fallen trees and roots are impacting the natural flows. The channel will be re-contoured to create a 0.49-acre channel. The removal of debris will open up areas that can be restored to improve the function of the drainage. The elevation of this drainage from the mining pit (DG-W-2) to its connection with Berkshire Creek will be assessed to determine if widening or deepening the drainage will be necessary. The trash and debris, as well as invasive and nonnative plants, will be removed from this drainage and willows and mulefat will be planted,

where appropriate, to rehabilitate the habitats along this drainage and improve the function of the drainage.

DG-4-Sheet Flow (Enhancement)

The DG-4-Sheet Flow mitigation area includes the non-wetland WOUS sheet flow portions (0.40 acre) of the DG-SF-1 and DG-SF-2 that are outside of where the non-wetland WOUS channel will be re-established. These sheet flow areas support patches of riparian plant species but perennial pepperweed and other nonnatives are present in monotypic patches and interspersed throughout. The open patches within these sheet flow areas will be enhanced through the removal of invasive and nonnative plants and subsequent planting of willows and mulefat, where appropriate.

DG-4-WOUS (Restoration)

The DG-4-WOUS mitigation area, which is approximately 1.84 acres in size (1.88 acres including the easements), includes an inlet that will be created from the main channel of the arroyo to allow flows from the arroyo to enter the non-wetland WOUS sheet flow portions (1.88 acre) of the inlet to the former mining pit (DG-W-2). These sheet flow areas support patches of riparian plant species but perennial pepperweed and other nonnatives are interspersed throughout. The open patches within these sheet flow areas will be improved through the removal of invasive and nonnative plants and subsequent planting of willows and mulefat, where appropriate.

DG-4-WOUS Connections (Creation)

DG-4-WOUS Connections comprises two areas with a combined acreage of approximately 0.14-acre area (0.22 acres including the easements). These two mitigation areas serve to re-establish channels in two locations: (1) from the mining pit to existing non-wetland WOUS located in DG-4, and (2) as a connection between two existing non-wetland WOUS areas within DG-4. Both mitigation areas are on the west side of the Reservoir, within DG-4 and east of DG-W-2 (Mining Pit) and DG-W-2 (Outlet). These two mitigation areas will allow for flows from DG-W-2 to reach existing non-wetland WOUS, and then flow to the side slopes of the western edge of the reservoir. In addition, the second mitigation area will allow flows to move in a southerly direction from existing non-wetland WOUS (when the Reservoir is filled with water) to the other section of non-wetland WOUS immediately to the south. The area where these channels will be formed is currently a mix of sparse riparian tree species, mulefat thickets, and nonnative infestations of perennial pepperweed, poison hemlock, and other nonnative species. During formation of these non-wetland WOUS avoidance of native plants will be achieved to the maximum extent practicable. Ultimately, the DG-4-WOUS Connections will re-establish flows through DG-4 and provide for connections to other existing riparian areas.

Specifically, DG-4-WOUS Connections will be re-contoured to improve conveyance of flows during inclement weather. In addition, soil manipulation during formation of channels will improve distribution of water in DG-4 and improve soil conditions to support growth of riparian trees. Following removal of nonnative and invasive plant species, planting and seeding with native riparian trees and shrubs will occur so that black willow woodland can grow and persist and improve the hydrological function of this area.

DG-1-WOUS (Enhancement)

An approximately 0.11-acre area of non-wetland WOUS along the western edge of DG-1 will be enhanced to improve the existing riparian woodland and unvegetated channel. The woodland, which is relatively sparsely vegetated, will be enhanced through the removal of nonnative plant species and planting of additional riparian and RAFSS plant species to increase the structural diversity. Because this area is immediately adjacent to the temporary impact area in DG-9, the full extent of the enhancement activities will be determined following the initial sediment removal.

DG-2 (Enhancement)

DG-2 is a 3.75-acre area (3.83 acres including the easements) in the eastern portion of the Reservoir located between the Reservoir channel and the pedestrian pathway. Currently, the area consists of a mix of riparian woodland, mulefat thickets, and riparian herbaceous vegetation communities with several areas dominated by exotics including perennial pepperweed, poison hemlock, mustards, wild radish, and Italian thistle. The mitigation objective for DG-2 is the enhancement of riparian habitat through the removal of nonnative plants and planting and seeding with willows, mulefat, and other riparian species where appropriate.

DG-2A (Creation)

DG-2A is a 0.10-acre area on the easternmost side of the Reservoir immediately adjacent to the pedestrian pathway. The area is on an elevated terrace nearly level with the adjacent pathway and primarily consists of a Mustard and Annual Brome Semi-Natural Herbaceous Stand community dominated by nonnative grasses, mustards, and horehound. Adjacent vegetation communities include pockets of riparian woodland interspersed in mulefat thickets on the west side, disturbed oak woodland bisecting the area, and coast live oak woodland on the east side of the pathway. The mitigation objective for DG-2A is growth of riparian habitat through the removal of exotics and native planting and seeding where appropriate.

DG-2B (Creation)

DG-2B is a 0.38-acre area on the easternmost side of the Reservoir also adjacent to the pedestrian pathway. The area is a disturbed area that gently slopes away from the pathway and it supports a Mustard and Annual Brome Semi-Natural Herbaceous Stand community dominated by poison hemlock, perennial pepperweed, nonnative grasses, mustards, wild radish, and Italian thistle. Adjacent vegetation communities include pockets of riparian woodland interspersed in mulefat thickets on the west side and north sides and oak woodland on the east side of the pathway. The mitigation objective for DG-2B is growth of riparian habitat through the removal of exotics and native planting and seeding where appropriate.

DG-3A (Enhancement)

DG-3A is a 1.15-acre area in the southeastern portion of the Reservoir located adjacent to the pedestrian pathway and it encompasses the area surrounding the Lower Altadena Drain. The area supports upland habitat and includes a small portion of the riparian habitat around the Lower Altadena Drain. The upland

portion of the area is comprised of disturbed riparian/oak woodland that is dominated by large eucalyptus trees with an understory of exotics, including mustards and nonnative grasses. The riparian portion is comprised of riparian woodland, riparian scrub, and wetland habitat, as well as a sparsely vegetated ruderal area. The wetland habitat formed due to urban runoff and is associated with the Lower Altadena Drain. The area within DG-3A is expected to support a perched wetland and willow woodland following the sediment removal and the construction of the side slopes. Following the construction of the side slopes, the flows from the Lower Altadena Drain are expected to descend down the side slopes into the reservoir. The side slope is expected to be wet and will likely support willows and mulefat. The wetland area located south of where the access road will be installed will likely also stay wet and may continue to support willows and mulefat. The mitigation objective for DG-3A, which is the area that surrounds where the Lower Altadena Drain is located, would be the enhancement of riparian/oak woodland communities via the removal of the eucalyptus trees and exotics and native planting and seeding where appropriate.

DG-4 (Enhancement)

DG-4 is a 27.07-acre area (28.40 including easements) encompassing the majority of the habitat on the western side of the Reservoir located just north of the dam and east of the paved access road/pathway. Currently, the area is dominated by riparian woodland interspersed with mulefat thickets and riparian herbaceous vegetation communities as well as intermittent transition zones between oak woodland and riparian woodland. The riparian habitats encompass approximately 23.94 acres (25.13 total acres including the easements). Much of the area is infested with large populations of perennial pepperweed along with poison hemlock, wild radish, mustards, and escaped cultivars (eucalyptus, fig trees, purple passionflower vine, and cape ivy). The mitigation objective for DG-4 is the enhancement of riparian communities through the removal of the exotics and escaped cultivars and native planting and seeding where appropriate. The northernmost portion of DG-4 is vegetated with 3.13 acres of coastal sage scrub (3.27 total acres including the easements) that is heavily infested with perennial pepper weed and other nonnative plants. These areas, which are located immediately adjacent to riparian habitats, will fulfill a buffer habitat role and will be enhanced through the removal of nonnative plants and the planting/seeding of additional native plant species to improve the habitat value.

DG-4A (Creation)

The areas that comprise DG-4A include approximately 5.42 acres (5.46 acres including the easements) of patches dominated by monotypic stands of perennial pepperweed. These areas are located within the willow/mulefat thickets mitigation area labelled DG-4 but because they contain almost no native vegetation, they will require a different approach to restore them to native habitat. These areas will require an aggressive approach to eliminate the perennial pepperweed. Following the removal of the pepperweed, some of the areas may need to be re-contoured and the topsoil layer that contains the seed and portions of the invasive plants that could spread may be removed to facilitate the elimination of these species. The areas will then be planted with native species characteristic of the surrounding riparian woodland/scrub. The mitigation objective for DG-4A is the removal of monotypic stands of invasive exotic plants followed by native planting and seeding to establish native riparian plant communities.

DG-4B (Creation)

DG-4B is a 0.54-acre area on the far west side of the Reservoir immediately adjacent to the pedestrian pathway and east of the Lower Oak Grove Parking Lot. Currently, the area consists of disturbed bare ground with patches of exotic annuals including horehound, mustards, poison hemlock, and perennial pepperweed. Adjacent vegetation communities include mulefat thickets and patches of willow thickets to the north, east, and south and disturbed areas to the west. The mitigation objective for DG-4B is the planting of mulefat thickets/riparian scrub habitat and the removal of the exotics and native planting and seeding where appropriate.

DG-4C (Enhancement)

DG-4C is a 0.45-acre area on the far west side of the Reservoir immediately adjacent to the pedestrian pathway and northeast of the Oak Grove Park lower parking lot. Currently, the area consists of disturbed riparian scrub habitat with patches of exotic annuals, including nonnative grasses and mustards. Adjacent vegetation communities include willow thickets to the east and south and disturbed areas to the west. The mitigation objective for DG-4C is the enhancement of riparian scrub habitat through the removal of the exotics and native planting and seeding where appropriate.

DG-5 (Creation)

DG-5 is a 0.25-acre area (0.26 acre including the easements) on the far west side of the Reservoir immediately adjacent to the pedestrian pathway and the larger enhancement area DG-4. Currently, the area consists of compacted disturbed bare ground with patches of riparian scrub. Adjacent vegetation communities include riparian woodland on the north, east, and west sides and oak woodland on the opposite side of the pathway to the west. One of the baskets from the disc golf course is located within DG-5 and the area receives fairly regular pedestrian traffic. The mitigation objective for DG-5 is the removal of the disc golf hole, re-contouring and decompaction of the soils, and the establishment of riparian woodland/riparian scrub habitat through the removal of the exotics and native planting and seeding where appropriate.

4.2.2 Upland Habitat Compensatory Mitigation Area

DG-1 (Enhancement)

DG-1 is a narrow 4.75-acre area (4.88 acres including the easements) located on the east side of channel at the upper end of the Reservoir. Currently, the area consists of disturbed California sagebrush/buckwheat scrub and small patches of RAFSS vegetation along the edges of the Reservoir channel. The area experiences moderate use from pedestrian travel via a narrow secondary trail that runs through the northern portion of the area. The mitigation objective for DG-1 is the enhancement of California sagebrush/buckwheat scrub and RAFSS habitats via the removal of exotics and native planting and seeding where appropriate. The 4.75 acres of the non-riparian habitat in DG-1 would be considered an upland buffer area.

4.2.3 Permanent Maintenance Area Side Slopes (Enhancement)

The side slopes of the Permanent Maintenance Area, which encompass 7.19 acres (7.34 acres not including the easements), will be replanted with native vegetation, including shrub and annual species associated with riparian and RAFSS vegetation communities. In addition, mulefat will be allowed to grow on the side slopes to provide foraging habitat for least Bell's vireo and other wildlife species. The side slopes will be seeded and then allowed to grow naturally with only maintenance to control nonnative species. The side slopes may be periodically affected by re-contouring if large sediment deposits bury portions of the side slopes. In this case, the sediment will be removed, the side slopes will be re-contoured and allowed to naturally revegetate, and the control of nonnative species will continue.

4.2.4 Temporary Impact Areas

DG-7 and DG-8 (Restoration)

Areas DG-7 and DG-8 are areas (1.15 and 0.91 acres, respectively [1.16 and 0.92 acres including easements]) are located in the upstream, central portion of the Reservoir on either side of the main channel. These areas will be temporarily impacted during the initial sediment removal phase of the Project and thus will be restored after the initial sediment removal. Currently, both areas consist of a mix of scoured streambed, riparian woodland, and mulefat thicket habitat types. Adjacent habitat types include scoured streambed, black willow thickets and mulefat thickets. The mitigation objective for DG-7 and DG-8 is replanting and seeding to achieve willow thickets and mulefat thickets in the areas that were temporarily impacted by the initial sediment removal.

DG-9 (Restoration)

DG-9 is a 13.82-acre area (14.09 acres including easements) in the upper central portion of the channel that will be temporarily impacted during the initial sediment removal phase of the Project. The majority of the area consists of scoured wash with patches of riparian woodland and RAFSS in the interior and California sage/buckwheat scrub on the periphery. The mitigation objective for DG-9 is restoration through replanting and seeding to achieve RAFSS and riparian scrub in the areas that are temporarily impacted by the initial sediment removal. Because this site is part of the active channel, the actual vegetation that grows in this mitigation area will depend upon site conditions following the initial removal of sediment. The vegetation that grows on the benches created between the active channels will provide suitable habitat for the slender-horned spineflower. After the removal of sediment from DG-9 is completed, the soils will be ripped to create micro-topographic features prior to being seeded with species characteristic of RAFSS. The entire area will be at a lower elevation relative to current conditions. The anticipated morphology of the channel will be braided with multiple terraces and low-flow channels. Where appropriate, willow and mulefat cuttings may be installed and these would be hand-watered until they become established. However, the seeded areas will not be irrigated but the seeding will be conducted just prior to the rainy season to take advantage of winter rains.

4.3 Implementation Schedule

The implementation of the restoration activities in the mitigation areas is anticipated to be conducted in three phases based on the types of activities and the timing of the sediment removal project. The phases are listed below but they will be subject to modifications based on various factors including the difficulty associated with nonnative plant species removal, preparation of final design plans, and potential minor changes that may need to occur, progression of the sediment removal project, and potential delays related to weather. Table 8 shows the anticipated implementation schedule for the Project.

- Phase 1 – Implementation of Phase 1 will begin immediately following the notice to proceed and will be ongoing for a period of just a few months to approximately two years, depending on the mitigation area. Phase 1 of mitigation will include initial weed removal for all the onsite mitigation areas excluding the temporary impact areas (DG-7, DG-8, and DG-9) and irrigation system installation, plant installation, and seed application for all the onsite mitigation areas excluding DG-1, the temporary impact areas, mitigation areas that require grading/re-contouring (DG-W-1, DG-W-2, DG-W-2 Outlet, DG-SF-1, DG-SF-2, DG-2 New Channels, DG-2 WOUS, DG-4-WOUS Connections), and/or mitigation areas that require the implementation of a grow and kill program (DG-4 & DG-4A). Mitigation area DG-1 will be seeded during Phase 1 following initial weed removal; however, no irrigation, container plants, or pole cuttings will be installed at DG-1. Implementation of Phase 1 will also include the preparation and implementation of the Final Design Plan for mitigation areas DG-W-1, DG-W-2, DG-W-2 Outlet, DG-SF-1, DG-SF-2, DG-2 New Channels, DG-2 WOUS, and DG-4-WOUS Connections. The grow and kill program for DG-4A will also be implemented during Phase 1 of mitigation and will continue for a duration of 2 years, or until the effort has been deemed successful by the RE. Irrigation installation, plant installation, and seed application will be conducted during Phase 2 of mitigation implementation for areas that require grading/re-contouring and/or implementation of a grow and kill program. Plant installation and seed application will take place during Phase 3 of mitigation implementation for the temporary impact areas.
- Phase 2 – Implementation of Phase 2 will begin in mitigation areas DG-W-1, DG-W-2, DG-W-2 Outlet, DG-SF-1, DG-SF-2, DG-2 New Channels, DG-2 WOUS, and DG-4-WOUS Connections following the completion of grading/re-contouring in these areas. Implementation of Phase 2 will begin in mitigation areas DG-4 and DG-4A following the success of the grow and kill program. Phase 2 of mitigation will include irrigation installation, plant installation, and seed application for these areas. Supplemental planting and seeding for areas planted and seeded during Phase 1 of mitigation implementation will occur during Phase 2 of mitigation implementation.
- Phase 3 – Implementation of Phase 3 will begin immediately following sediment removal in the temporary impact areas. Phase 3 of mitigation will include planting and seeding in the temporary impact areas. Supplemental planting and seeding for areas planted and seeded during Phase 1 and Phase 2 of mitigation implementation will occur during Phase 3 of mitigation implementation.

Table 8. Implementation Schedule		
MITIGATION IMPLEMENTATION		
Activity	Timeframe	Mitigation Area
Implementation		
Site Preparation		
Initial Nonnative & Invasive Species Control	October 2018 through December 2018	All onsite excluding the temporary impact areas (DG-7, DG-8, DG-9).
Grow and kill program	October 2018 through September 2020	DG-4, DG-4A, and other infested areas as determined by the RE.
Final Design Plan Preparation	October 2018 through November 2018	DG-W-1, DG-W-2, DG-W-2 Outlet, DG-SF-1, DG-SF-2, DG-2 New Channels, DG-2 WOUS, & DG-4-WOUS Connections.
Grading and Recontouring	November 2018 through TBD	DG-W-1, DG-W-2, DG-W-2 Outlet, DG-SF-1, DG-SF-2, DG-2 New Channels, DG-2 WOUS, & DG-4-WOUS Connections.
Irrigation System Installation	November 2018 through December 2018	All onsite excluding DG-1, DG-4A, the temporary impact areas, & the areas to be graded/recontoured.
	Following Grading/Recontouring	DG-W-1, DG-W-2, DG-W-2 Outlet, DG-SF-1, DG-SF-2, DG-2 New Channels, DG-2 WOUS, & DG-4-WOUS Connections.
	Following Invasive Weed Eradication	DG-4, DG-4A, and other infested areas as determined by the RE.
Planting and Seeding		
Planting	December 2018 through January 2019	All onsite excluding DG-1, DG-4A, the temporary impact areas, & the areas to be graded/recontoured.
	January 2019 through December 2019	DG-W-1, DG-W-2, DG-W-2 Outlet, DG-SF-1, DG-SF-2, DG-2 New Channels, DG-2 WOUS, & DG-4-WOUS Connections.
	November 2019 through February 2020	DG-4, DG-4A, and other infested areas as determined by the RE.
	Following Grading/Recontouring	Temporary impact areas.
Seeding	January 2019 through January 2019	All onsite excluding DG-4A, the temporary impact areas, & the areas to be graded/recontoured.
	December 2019 through January 2020	DG-W-1 & DG-W-2
	May 2019 through June 2019	DG-W-2 Outlet, DG-SF-1, DG-SF-2, DG-2 New Channels, DG-2 WOUS, & DG-4-WOUS Connections.
	January 2019 through January 2020	DG-4, DG-4A, and other infested areas as determined by the RE.
	Following Planting	Temporary impact areas.
120-Day Plant Establishment Period		
Monitoring (Horticultural, photo-documentation)	Monthly	All onsite

Table 8. Implementation Schedule		
MITIGATION IMPLEMENTATION		
Site Irrigation	Once per week (unless natural rainfall occurs)	
Irrigation System Maintenance	Monthly	
Weed Abatement/Invasive Plant Control	Monthly (at a minimum)	
Maintenance of site protection measures (if required)	Monthly	
Establish punch-list of outstanding items; Landscape Contractor has three weeks to complete.	Pre-Completion Site Walk (3 weeks prior to end of PEP)	
Verify punch-list has been completed.	Final Site Walk	
Email Memorandum to LACFCD and Agencies	End of Plant Establishment Period	

4.4 Site Preparation

4.4.1 Nonnative Plant Control

Initial Weed Control

Nonnative and invasive weed species are present in varying degrees throughout the mitigation areas. Of particular concern are mitigation areas with dense populations of perennial pepperweed, giant reed (*Arundo donax*), salt cedar (*Tamarix ramosissima*), Spanish broom (*Spartium junceum*), pampas grass (*Cortaderia jubata*), and African fountain grass (*Pennisetum setaceum*). Implementation of pre-planting weed eradication for the onsite mitigation areas, excluding the temporary impact areas, will begin immediately following the notice to proceed and prior to any planting or seeding activities. Pre-planting nonnative and invasive plant removal will be conducted using a combination of hand tools, weed whips, and herbicide treatment. During the initial pre-planting weed removal effort, all nonnative and invasive plant species that have gone to flower or seed will be removed by hand or with a weed whip. All cut or hand removed plant material will be collected, removed from the mitigation areas, and disposed of at an appropriate facility located outside of the Project site. Nonnative and invasive weed species not in flower or seed will be cut and treated with herbicide. Following the initial removal effort, germinating weeds will be treated with herbicide prior to flowering and seed production until planting activities are scheduled to begin for these areas. Any herbicides and associated surfactants used adjacent to open water will be limited to those registered for aquatic use and approved for use in wetland restoration by the regulatory agencies. It is anticipated that an aquatic-approved form of glyphosate (i.e., Aquamaster®) will be for this task. A blue marking dye will be added to allow for the identification of areas sprayed. If weed removal in these areas is scheduled to occur during the nesting bird season (February 15th to August 31st), a biological monitor will be present during the removal activities. For areas that have been identified as being infested with perennial pepperweed (DG-4A), a grow and kill program will be implemented for a period of up to two years, or until the weeding effort is deemed successful by the RE. Coordinates will be

taken by the RE using a Global Positioning System (GPS) to document any additional areas determined to be infested with perennial pepperweed and other invasive nonnative plants that will need to be included in the grow and kill program.

Grow and Kill Program

Several areas throughout the Project site and within the proposed onsite mitigation areas are currently dominated by perennial pepperweed and other invasive, nonnative weed species. Perennial pepperweed infestations are especially problematic in the DG-4 and DG-4A mitigation areas. In these areas, a grow and kill program will be implemented with the purpose of depleting the seed bank of perennial pepperweed and other invasive weed species. The grow and kill program will be implemented immediately following the notice to proceed and prior to any planting or seeding activities. Initial removal in highly infested areas will consist of mechanical removal via mowing, weed whips, and hand removal with the purpose of reducing multiple years of thatch that has accumulated in these areas. All mowed, cut, and hand removed plant material will be collected, removed from the mitigation areas, and disposed of at an appropriate facility located outside of the Project site. In order to minimize soil compaction, rubber-tired vehicles (i.e., tractors, front-end loaders) with mowing attachments will be used for this task. Hand removal or weed whips will be employed in those areas adjacent to sensitive resources, open water, or native vegetation. All vehicles used in these areas will be cleaned of any dirt or plant material prior to leaving the mitigation area to avoid spreading the seed of any weedy species. Following the initial mechanical removal, germinating weeds will be treated with herbicide prior to flowering and seed production for a period of up to two years or until the RE has determined that sufficient eradication has occurred. The location of follow-up treatment areas will be determined by the RE and marked with a GPS device. Implementing an appropriate grow and kill program prior to planting and seeding is important to help minimize crowding out of native species by perennial pepperweed and other invasive, nonnative plant species. If weed removal in these areas is scheduled to occur during the nesting bird season (February 15th to August 31st), a biological monitor will need to be present during the removal activities.

4.4.2 Soil Testing and Amendments

Site-specific physical and/or chemical analyses of soils may be required for select proposed mitigation areas, particularly the areas within the Reservoir targeted for habitat re-establishment. Based on several site visits and surveys in recent years, it is evident that native vegetation that is present is in a condition typically seen in areas that aren't as disturbed. This determination supports the assumption that the majority of the mitigation areas will not need soil testing. The soils in mitigation areas DG-W-1 and DG-W-2 may be tested following earthwork, depending upon the soil conditions found during the earthwork, and prior to native planting and seeding activities. Soil testing will be similar to an agricultural suitability test and will include an assessment of soil texture, nutrients, pH, and salinity. Based on site-specific soil test results, some modification of soil structure or chemistry may be needed prior to the implementation of planting and seeding activities at some of the mitigation areas. This may include amendments to adjust pH levels, salinity, organic content, or native soil microorganisms (i.e., mycorrhizae).

4.4.3 *Decompaction/Ripping*

Several of the proposed mitigation areas have significantly compacted soils due to years of pedestrian foot traffic, vehicle traffic, and/or high sediment loads. The majority of these include the onsite mitigation areas within the Reservoir (DG-2A, DG-2B, DG-4B, DG-4C, and DG-5). Following initial weed removal activities, but prior to planting and seeding activities, soils on all of these areas will be ripped to a depth of six inches to twelve inches, depending on site conditions and target habitat type. It is anticipated that DG-W-1 will sustain soil compaction during grading activities. Compaction testing is not planned; however, this site will be de-compacted prior to any planting or seeding with a goal of 60 to 70 percent compaction.

4.4.4 *Grading/Contouring*

Following the initial weed control implementation but prior to implementation of planting and seeding activities, several of the mitigation areas will require grading and/or re-contouring for the purpose of creating site conditions, including hydrology and topography, which will support the proposed mitigation. The specific methodology that will be used during the grading and contouring portion of site preparation is discussed for each mitigation site below. A further detailed discussion the specific methodology will be provided in the Final Design Plan which will be prepared during Phase 1 of mitigation implementation.

DG-W-1 (Johnson Field)

Soil Exportation and Redistribution

Prior to the implementation of planting and seeding activities, the 11,250 cubic yards of sediment that are currently being stockpiled in the center of the mitigation area will be exported off-site to an appropriate location as these soils will not be used for future habitat restoration/creation.

Following the removal of the 11,250 cubic yards of sediment from the mitigation area, the raised trail around the west and south sides of the basin will be abandoned with the purpose of supporting the creation of riparian woodland at this site. Approximately 7,500 cubic yards of soils from the abandoned trail will be incorporated into existing soils at the mitigation area as a substrate for the plantings. Only the portion of the trail that surrounds the site will be abandoned so that the continuum of the trail system on the north and east sides of the basin will not be interrupted. The soil that comprises the trail base will be removed up to the margin of the existing native riparian vegetation on the west and south and to grade with base of palm trees existing in the area.

A RE will be onsite during grading to ensure that the minimum amount of riparian vegetation (i.e., mulefat and elderberry [*Sambucus nigra* ssp. *caerulea*]) is disturbed. The trail soil will be decompacted and homogenized with the upper three feet of soil that remains following export of sediments from the center of the site. Prior to final contouring of the site, all ornamental/nonnative palms will be removed and disposed of legally off site. The final topography of the mitigation area will slope slightly upward to the east with a rise of approximately two to three feet above the existing main channel elevation. In addition, the final mitigation area will meet flush with the existing riparian habitat that exists to the south and southwestern edges of the site. Following redistribution and homogenization of soils, compaction to no greater than 70 percent should occur.

Modify Existing Culvert

The culvert that currently drains into the DG-2 mitigation area will be relocated to the southeastern corner of DG-W-1, which may involve re-routing the down-drain from Kent Street so that it traverses the existing access road diagonally in a slightly northerly direction. Following the culvert relocation, a culvert pipe, no less than 18 inches wide, will be installed under the existing trail. The existing culvert will be left intact. The culvert inlet will be fortified with wing walls, or other means, so that the potential for erosion is minimized. The culvert will traverse below an existing maintenance road and a cemented cobble-stone drainage will be constructed that ends at toe of slope and connects to the culvert outlet to prevent slope erosion. The cobble-stone drainage will be reinforced with rebar. Slope drainage below the culvert outlet should be a minimum of 6-feet wide and have a concave surface. Cemented rip-rap will be installed at the toe of slope as an energy dissipater. Rip-rap zone should be approximately 100 square feet in size. Equivalent materials may be used if erosion control can still be achieved.

DG-W-2 (Mining Pit) and DG-W-2 (Mining Pit Outlet)

Improve Existing Culvert

To assist with providing conditions that are conducive to supporting riparian and wetland habitat, improvements to the existing culvert that is present may occur. This will be further evaluated during the final design phase of the Project. The culvert inlet is positioned at the southeastern margin of the adjacent disc golf course and to the west of the Project Area. It appears that during storm events run-off flows from northeast to southwest at a slope of approximately two degrees. The drainage in the immediate vicinity of the culvert inlet has a width of four to six feet and a depth of two to three feet. The culvert inlet is centered at latitude 34°11'36.91"N, longitude 118°10'29.00"W. The culvert inlet may be fortified with wing walls, or other means, so that the potential for erosion is minimized. The culvert traverses below an existing maintenance road and, if necessary, a cemented cobble-stone drainage will be constructed that ends at toe of slope and connects to the culvert outlet to prevent slope erosion. The cobble-stone drainage will be reinforced with rebar. Slope drainage below the culvert outlet should be a minimum of 6-feet wide and have a concave shape. Cemented rip-rap may be included at the toe of slope as an energy dissipater. The rip-rap zone should be approximately 100 square feet in size. Equivalent materials may be used if erosion control can still be achieved. Existing culvert may be improved so that erosion and increased sedimentation into the mining pit is minimized.

Soil Manipulation and Nonnative Plant Removal

Accumulation of a variety of sediments has occurred over time, the majority of which appear to be from sediment-laden water entering the area from upland areas. However, in the past, inundation of the area has occurred in part due to high flows from the Arroyo Seco that transported sediments from the mountains located to the north. Rather than major exportation of soils from this area, the top four inches of soil should be removed and exported off site only from areas that are dominated by nonnative plant species such as curly dock (nonnative plant). A RE will need to be present to determine the limits of soil removal and to identify the vegetation that should be avoided. Following removal of nonnative vegetation and its seed bank, a mini skid-steer dozer will be used to break-up the top two to three feet of soil and homogenize it with the sandy substrate that exists lower in the soil profile. Some of the soil will be used to

create a mound near the outlet of the culvert. This will serve to bifurcate the flows from the culvert into two channels that will meander through the mining pit. Following homogenization of soils, compaction to no greater than 70 percent should occur. Use of a mini dozer will reduce the impact to existing native vegetation and allow for ease of movement within the work area. The approximate area that would require soil removal and soil mixing is 1.3 acres. The approximate volume of sediments mixed with vegetation that would need to be removed is 690 cubic yards.

Re-Establish Connection to Main Channel and Diversion to the East

The DG-W-2 site is expected to support riparian woodland species, and potentially wetland species, in the future and have some connection to the main channel of the Arroyo Seco. In order to do this, a drainage feature will be created that originates at the southwest margin of DG-W-2 site and flows to the southwest to meet with an existing tributary of the Arroyo Seco. The drainage feature is anticipated to require a length of 750 feet and have a width of six feet and a depth of two feet. The drainage feature should meander slightly to avoid a straight-edge trajectory. In addition, a second outlet that originates from the same location as the channel will be created to convey storm flows to DG-4 WOUS Connections. During storm flows, the channel will be overtopped to allow flows to enter the DG-WOUS area, where flows will be conveyed to the southeast. These flows will naturally move through the existing WOUS areas and will enter the main channel of the arroyo by flowing down the side slopes in the same location as where they currently exist. A RE will need to be present to determine the most appropriate path to follow. The RE will flag the centerline of the path prior to creation of the drainage feature.

DG-SF-1, DG-SF-2, DG-2 New Channels, DG-2 WOUS, DG-4 Drainage, DG-4-WOUS Connections

Areas DG-SF-1, DG-SF-2, DG-2 New Channels, DG-2 WOUS, DG-4 Drainage, and DG-4-WOUS are expected to support riparian woodland species and have a connection to the main channel of the Arroyo Seco. DG-SF-1 and DG-SF-2 will be re-contoured to improve conveyance of flows during inclement weather, improve distribution of water throughout mitigation area, and to improve soil conditions to support riparian trees. A total of approximately 430 feet of the channel will be re-contoured within DG-SF-1 and DG-SF-2. DG-2 New Channels will also be re-contoured to improve conveyance of flows during inclement weather, improve distribution of water throughout mitigation area, and to improve soil conditions to support riparian trees. A total of approximately 975 feet of the channels will be re-contoured with a width of approximately 10 to 20 feet and a depth of 1.5 to 2 feet. Re-contouring within DG-2 WOUS and DG-4 Drainage will occur in select areas to improve conveyance of flows during inclement weather. DG-4-WOUS will be re-contoured to improve conveyance of flows during inclement weather, improve distribution of water throughout mitigation area, and to improve soil conditions to support riparian trees. In addition, re-contouring will occur to improve hydrology so that DG-W-2 can convey flows to non-wetland WOUS in DG-4 and to create a connection between two areas of non-wetland WOUS in DG-4.

DG-7, DG-8 and DG-9 (Temporary Impacts)

Areas DG-7, DG-8, and DG-9 are also planned temporary impact areas within the proposed Project boundary where grading and/or contouring may be required to prepare the areas for riparian habitat.

Final grading and contouring plans will be addressed in the Final Design Plan. In DG-7, an inlet weir will be constructed where flows overtopping the existing channel currently enter DG-4 WOUS. The weir will allow water that backs up in the reservoir when the dam outlets are closed to enter the upstream portion of the DG-4 WOUS mitigation area. Water that enters the weir will flow from the main channel, through DG-4 WOUS to the mining pit as it has done in the past. The positioning of the weir will not allow stormflows from the main channel to enter DG-WOUS to avoid having large sediment deposits enter the mitigation areas on the west side of the main channel. The design of the weir will be completed during the final design phase of the Project.

4.5 Structural Habitat Features

In order to provide structural heterogeneity, immediate wildlife habitat benefits, and opportunities for additional plant growth, structural habitat features will be placed in select mitigation areas. These features may include rocks/boulders, brush piles, coarse woody debris, standing snags, and/or plant hummocks/sediment mounds. Structural habitat features will be put in place following any required earthwork (i.e., grading, ripping) but prior to any planting or seeding activities. Final locations of structural features will be addressed in the Final Planting Plan and may be adjusted to suit current site conditions.

Much of the material used for the structural habitat features for the mitigation areas within the Reservoir can be salvaged from those areas impacted by the proposed Project. Logs and other coarse and woody debris will be salvaged from initial vegetation removal activities while rocks and boulders will be salvaged from subsequent excavation activities. Areas within the Project footprint infested with invasive nonnative plants (e.g., perennial pepperweed) will be avoided to minimize further spread of invasive plants.

4.6 Irrigation Specifications

Due to the current hydrology and proposed final hydrology of the mitigation areas, it is anticipated that the mitigation areas will eventually be hydrologically self-sustaining once the installed trees and shrubs have become well established. Supplemental irrigation will be applied to the installed container plants and pole cuttings during periods when adequate rainfall does not occur until the installed plants have become well established. Irrigation will not be implemented in the areas where only seed is applied. In areas where high to moderate flow has the potential to occur, container plants and pole cuttings will be watered by hand using a water truck and a hose fitted with a water disbursement or pressure-reducing device to prevent damage to the recently installed container plants and pole cuttings. In areas where high to moderate flow is unlikely to occur, a simple poly-tube irrigation system will be installed for mitigation areas where container plants and/or pole cuttings are installed. The irrigation system will be installed prior to the planting of container plants and/or pole cuttings. The irrigation system will need to be connected to a municipal water source fitted with a meter, pressure regulator, and back-flow preventer. Emitters will be positioned within irrigation basins of each container plant and pole cutting and supplemental irrigation will be supplied until it is apparent the tree can survive without supplemental irrigation (i.e., roots have grown to a sufficient depth to reach groundwater).

Supplemental irrigation will take place for a period of no more than three years following plant installation. In order for the proposed mitigation areas to meet the performance standards and

subsequently be deemed successful by the regulatory agencies, any restored habitat must be self-sustaining for two consecutive years following the removal of supplemental irrigation.

4.7 Planting Specifications

4.7.1 Desired Vegetation Communities

***Baccharis salicifolia* Shrubland Alliance**

Baccharis salicifolia Shrubland Alliance, or riparian scrub, is one of the primary vegetation communities targeted for native planting and seeding activities within many of the proposed mitigation areas. It is one of the dominant plant communities within the Reservoir, often sharing similar species of willows with adjacent riparian woodland habitats. The planting palette for riparian scrub habitat includes perennial native species such as mulefat, black willow, red willow, arroyo willow, and cottonwood (Table 9). The seeding palette includes species such as mugwort, western ragweed, and beardless wild rye, and many other riparian herbaceous species (Table 10). These palettes will primarily be used to define those species used for onsite re-establishment and enhancement mitigation areas within the Reservoir. The species composition of the container plant palette and the seed mix may vary depending upon the results of transects conducted in the reference site for this plant community and in the reference site located in occupied least Bell's vireo nesting habitat.

Table 9. *Baccharis salicifolia* Shrubland Alliance Planting Palette

Scientific Name	Common Name	Container Size (Gallon)	# Per Acre ¹
<i>Artemisia douglasiana</i>	mugwort	1 gal	100
<i>Baccharis pilularis</i>	coyote brush	1 gal	100
<i>Baccharis salicifolia</i>	mulefat	cutting/1 gal	250
<i>Populus fremontii</i>	Fremont cottonwood	1 gal	100
<i>Rubus ursinus</i>	California blackberry	1 gall	100
<i>Rosa californica</i>	California wild rose	1 gal	100
<i>Salix gooddingii</i>	black willow	cutting/1 gal	200
<i>Salix laevigata</i>	red willow	cutting/1 gal	100
<i>Salix lasiolepis</i>	arroyo willow	cutting/1 gal	100
<i>Sambucus mexicana</i>	Mexican elderberry	1 gal	50
Total Plants			1200

¹Any native container plant substitutions that may be necessary will be at the discretion of the Restoration Ecologist. All species substitutions must be approved by the County, USACE, USFWS, CDFW, and Restoration Ecologist.

Table 10. <i>Baccharis salicifolia</i> Shrubland Alliance Seed Mix		
Scientific Name	Common Name	Bulk Lbs /Acre
<i>Ambrosia psilostachya</i>	western ragweed	4
<i>Artemisia douglasiana</i>	mugwort	4
<i>Elymus triticoides</i>	beardless wild rye	4
<i>Urtica dioica ssp. holosericea</i>	hoary nettle	4
<i>Achillea millefolium</i>	yarrow	1
<i>Artemisia dracunculus</i>	tarragon	1
<i>Bromus carinatus</i>	California brome	1
<i>Calystegia macrostegia ssp. intermedia</i>	south coast morning glory	0.5
<i>Cirsium occidentale</i>	western thistle	1
<i>Elymus condensatus</i>	giant wild rye	1
<i>Epilobium canum</i>	California fuschia	0.5
<i>Eriodictyon parryi</i>	poodle-dog bush	0.5
<i>Eschscholzia californica</i>	California poppy	0.5
<i>Galium aparine</i>	Cleavers	0.5
<i>Gutierrezia californica</i>	matchweed	0.5
<i>Lupinus bicolor</i>	bicolored lupine	0.5
<i>Lupinus truncata</i>	blunt-leaved lupine	0.5
<i>Monardella breweri ssp. lanceolata</i>	mustang mint	0.5
<i>Phacelia cicutaria</i>	caterpillar phacelia	0.5
<i>Phacelia distans</i>	common phacelia	0.5
<i>Phacelia minor</i>	wild Canterbury bells	0.5
<i>Phacelia parryi</i>	Parry's phacelia	0.5
<i>Marah macrocarpa</i>	chilicothe	0.5
<i>Pseudognaphalium californicum</i>	California everlasting	0.5
<i>Rumex hymenosepalus</i>	wild rhubarb	0.5
<i>Vitis girdiana</i>	Southern wild grape	1
Total Bulk Lbs. of Seed		30

Should the percent purity and germination of each species not be available at the time of ordering, the Restoration Ecologist shall approve any variation on seed purity and germination presented by the Installation Contractor. All species substitutions must be approved by the County, USACE, USFWS, CDFW, and Restoration Ecologist.

***Salix gooddingii* Woodland Alliance**

Salix gooddingii Woodland Alliance is another desirable plant community for the mitigation areas because it currently exists within the Reservoir. The planting palette includes species characteristic of this community such as black willow, red willow, Mexican elderberry, mulefat, and mugwort (Table 11). The seeding palette includes species such as yerba mansa, mugwort, tall flatsedge, hoary nettle, and many other riparian herbaceous species (Table 12). These palettes will primarily be used to define those species used to enhance disturbed riparian woodland mitigation areas within the Reservoir. The species composition of the container plant palette and the seed mix may vary depending upon the results of

transects conducted in the reference site for this plant community and in the reference site located in occupied least Bell's vireo nesting habitat.

Scientific Name	Common Name	Container Size (Gallon)	# Per Acre ¹
<i>Artemisia douglasiana</i>	mugwort	1 gal	100
<i>Baccharis pilularis</i>	coyote brush	1 gal	100
<i>Baccharis salicifolia</i>	mulefat	cutting/1 gal	250
<i>Populus fremontii</i>	Fremont cottonwood	1 gal	100
<i>Rubus ursinus</i>	California blackberry	1 gall	100
<i>Rosa californica</i>	California wild rose	1 gal	100
<i>Salix gooddingii</i>	black willow	cutting/1 gal	200
<i>Salix laevigata</i>	red willow	cutting/1 gal	100
<i>Salix lasiolepis</i>	arroyo willow	cutting/1 gal	100
<i>Sambucus mexicana</i>	Mexican elderberry	1 gal	50
Total Plants			1200

¹Any native container plant substitutions that may be necessary will be at the discretion of the Restoration Ecologist. All species substitutions must be approved by the County, USACE, USFWS, CDFW, and Restoration Ecologist.

Scientific Name	Common Name	Bulk Lbs /Acre
<i>Anemopsis californica</i>	yerba mansa	3
<i>Artemisia douglasiana</i>	mugwort	5
<i>Cyperus eragrostis</i>	tall flatsedge	3
<i>Elymus triticoides</i>	beardless wild rye	2
<i>Urtica dioica ssp. holosericea</i>	hoary nettle	3
<i>Achillea millefolium</i>	yarrow	1
<i>Artemisia dracunculus</i>	tarragon	1
<i>Bromus carinatus</i>	California brome	1
<i>Calystegia macrostegia ssp. intermedia</i>	south coast morning glory	0.5
<i>Cirsium occidentale</i>	western thistle	1
<i>Elymus condensatus</i>	giant wild rye	1
<i>Epilobium canum</i>	California fuschia	0.5
<i>Eriodictyon parryi</i>	poodle-dog bush	0.5
<i>Eschscholzia californica</i>	California poppy	0.5
<i>Galium aparine</i>	Cleavers	0.5
<i>Gutierrezia californica</i>	matchweed	0.5
<i>Lupinus bicolor</i>	bicolored lupine	0.5
<i>Lupinus truncata</i>	blunt-leaved lupine	0.5
<i>Monardella breweri ssp. lanceolata</i>	mustang mint	0.5

Table 12. *Salix gooddingii* Woodland Alliance Seed Mix

Scientific Name	Common Name	Bulk Lbs /Acre
<i>Phacelia cicutaria</i>	caterpillar phacelia	0.5
<i>Phacelia distans</i>	common phacelia	0.5
<i>Phacelia minor</i>	wild Canterbury bells	0.5
<i>Phacelia parryi</i>	Parry's phacelia	0.5
<i>Marah macrocarpa</i>	chilicothe	0.5
<i>Pseudognaphalium californicum</i>	California everlasting	0.5
<i>Rumex hymenosepalus</i>	wild rhubarb	0.5
<i>Vitis girdiana</i>	Southern wild grape	1
Total Bulk Lbs. of Seed		30

Should the percent purity and germination of each species not be available at the time of ordering, the Restoration Ecologist shall approve any variation on seed purity and germination presented by the Installation Contractor. All species substitutions must be approved by the County, USACE, USFWS, CDFW, and Restoration Ecologist.

***Quercus agrifolia* Woodland Alliance**

Quercus agrifolia Woodland Alliance, or Coast Live Oak Woodland, is a desired plant community for some of the mitigation areas and components of this community may be intermixed with *Baccharis salicifolia* Woodland Alliance in mitigation areas DG-2A and DG-2B but it will primarily be planted in mitigation area DG-3A. The planting palette includes species characteristic of this community such as poison oak, California blackberry, and California melic (Table 13). This palette will primarily be used to define those species used to enhance disturbed coast live oak woodland mitigation areas within the Reservoir. Oak trees may need to be transplanted from impact areas where the access roads will be constructed or additional oaks may need to be planted at oak woodland mitigation areas to compensate for Project impacts. The plant palette in Table 4.6 will also be used at new oak woodland mitigation areas.

Table 13. *Quercus agrifolia* Woodland Alliance Planting Palette

Scientific Name	Common Name	Container Size (Gallon)	# Per Acre ¹
<i>Melica imperfecta</i>	California melic	1 gal	100
<i>Polypodium californicum</i>	California polypody	1 gal	100
<i>Quercus agrifolia</i>	coast live oak	1 gal, 5 gal, 10 gal, 15 gal	150 ²
<i>Rubus ursinus</i>	California blackberry	1 gal	100
<i>Ericameria pinifolia</i>	pinebush	1 gal	100
<i>Toxicodendron diversilobum</i>	poison oak	1 gal	100
Total Plants			650

¹ All species substitutions must be approved by the County, USACE, USFWS, CDFW, and Restoration Ecologist.

²Number of plants accounts for potential die-off of approximately 50 percent of planted oaks. Planting total for oaks calculated at 30 feet on-center.

***Lepidospartum squamatum* Shrubland Alliance/*Baccharis salicifolia* Shrubland Alliance**

Lepidospartum squamatum Shrubland Alliance (RAFSS) – *Baccharis salicifolia* Shrubland Alliance is scattered within the upstream portions of the Reservoir and will be re-vegetated in mitigation area DG-9

and on the side slopes of the Episodic Maintenance Area. The planting palette includes species characteristic of this community such as scalebroom (*Lepidospartum squamatum*), mulefat (*Baccharis salicifolia*), prickly-pear cactus, black sage (*Salvia mellifera*), and hairy yerba santa (*Eriodictyon trichocalyx*) (Table 14). Potential locations where container plants for scalebroom, mulefat, prickly-pear cactus and hairy yerba santa will be placed in DG-9 will be determined after the completion of the sediment removal in this area but will most likely be located along the edges. Seeding will likely be the primary method used to re-establish the RAFSS in the majority of DG-9 due to the fact that this area will be subject to natural flows and scour. In addition, seeding may also be conducted on portions of the slopes of DG-1 if nonnative plant species removal is conducted and native plant species don't naturally recruit into the areas where the nonnative plants are removed. The plant species in the seed palette are adapted to growing in the active wash. The seeding palette includes California sagebrush, California croton, California buckwheat, slender buckwheat, and threadleaf snakeweed (Table 15).

Scientific Name	Common Name	Container Size (Gallon)	# Per Acre ¹
<i>Artemisia californica</i>	California sagebrush	1	50
<i>Baccharis salicifolia</i>	Mulefat	1	100
<i>Eriodictyon trichocalyx</i>	hairy yerba santa	1	50
<i>Eriogonum fasciculatum</i>	California buckwheat	1	50
<i>Lepidospartum squamatum</i>	scalebroom	1	100
<i>Lotus scoparius</i>	deerweed	1	50
<i>Opuntia littoralis</i>	prickly-pear cactus	1	20
<i>Salvia mellifera</i>	black sage	1	50
Total Plants			470

¹ All species substitutions must be approved by the County, USACE, USFWS, CDFW, and Restoration Ecologist.

Scientific Name	Common Name	Bulk Lbs /Acre
<i>Artemisia californica</i>	California sagebrush	2
<i>Baccharis salicifolia</i>	Mulefat	2
<i>Croton californicus</i>	California croton	2
<i>Eriodictyon trichocalyx</i>	hairy yerba santa	2
<i>Eriogonum fasciculatum</i>	California buckwheat	4
<i>Eriogonum gracile</i>	slender buckwheat	5
<i>Gutierrezia microcephala</i>	threadleaf snakeweed	3
<i>Lepidospartum squamatum</i>	scalebroom	3
<i>Lotus scoparius</i>	deerweed	2
<i>Salvia mellifera</i>	black sage	3
<i>Senecio flaccidus</i>	threadleaf ragwort	2
Total Bulk Lbs. of Seed		30

Prior to finalizing seed order the Restoration Ecologist shall review the percent purity, percent germination, and percent pure live seed per bulk pound to ensure the proper amount of bulk seed is planned for seeding which will result in revision to the amounts listed above. All species substitutions must be approved by the County, USACE, USFWS, CDFW, and Restoration Ecologist.

***Artemisia californica* – *Eriogonum fasciculatum* Shrubland Alliance**

Artemisia californica – *Eriogonum fasciculatum* Shrubland Alliance is a desired plant community for several of the mitigation areas. The planting palette includes species characteristic of this community such as California sage, buckwheat, deerweed, and white sage (*Salvia apiana*) (Table 16). This palette will primarily be used to define those species used to re-establish or enhance disturbed buffer habitats within several of the proposed mitigation areas within the Reservoir. The seeding palette includes California sagebrush, giant wildrye, slender buckwheat, foothill needlegrass, threadleaf snakeweed, and several other species (Table 17).

Scientific Name	Common Name	Container Size (Gallon)	# Per Acre ¹
<i>Artemisia californica</i>	California sagebrush	1	150
<i>Encelia californica</i>	California encella	1	50
<i>Eriogonum fasciculatum</i>	California buckwheat	1	150
<i>Isocoma menziesii</i> var. <i>menziesii</i>	goldenbush	1	20
<i>Lotus scoparius</i>	deerweed	1	50
<i>Malosma laurina</i>	laurel sumac	1	30
<i>Opuntia littoralis</i>	prickly-pear cactus	1	20
<i>Salvia mellifera</i>	black sage	1	50
Total Plants			520

¹Any native container plant substitutions that may be necessary will be at the discretion of the Project Restoration Ecologist. All species substitutions must be approved by the County, USACE, USFWS, CDFW, and Restoration Ecologist.

Scientific Name	Common Name	Bulk Lbs /Acre
<i>Acmispon glaber</i>	deerweed	8
<i>Artemisia californica</i>	California sagebrush	3
<i>Eriogonum gracile</i>	slender buckwheat	5
<i>Gutierrezia microcephala</i>	threadleaf snakeweed	2
<i>Leymus condensatus</i>	giant wildrye	6
<i>Lupinus bicolor</i>	miniature lupine	4
<i>Nassella lepida</i>	foothill needlegrass	3
Total Bulk Lbs. of Seed		31

Should the percent purity and germination of each species not be available at the time of ordering, the Restoration Ecologist shall approve any variation on seed purity and germination presented by the Installation Contractor. All species substitutions must be approved by the County, USACE, USFWS, CDFW, and Restoration Ecologist.

***Eriogonum fasciculatum* Shrubland Alliance – *Lepidospartum squamatum* Shrubland Alliance**

Eriogonum fasciculatum Shrubland Alliance - *Lepidospartum squamatum* Shrubland Alliance is a desired plant community in the mitigation area along the eastern slope between the main channel and the City's percolation basins. The seed mix includes species characteristic of this community such as buckwheat, deerweed, and white sage (*Salvia apiana*) (Table 18). This palette will primarily be used to define those species used to re-establish or enhance disturbed buffer habitats within several of the proposed mitigation areas within the Reservoir. The seeding palette includes California sagebrush, giant wildrye, slender buckwheat, foothill needlegrass, threadleaf snakeweed, and several other species.

Table 18. <i>Eriogonum fasciculatum</i> Shrubland Alliance - <i>Lepidospartum squamatum</i> Shrubland Alliance Seed Mix		
Scientific Name	Common Name	Bulk Lbs /Acre
<i>Acmispon glaber</i>	deerweed	2
<i>Artemisia californica</i>	California sagebrush	3
<i>Eriogonum gracile</i>	slender buckwheat	3
<i>Gutierrezia microcephala</i>	threadleaf snakeweed	2
<i>Leymus condensatus</i>	giant wildrye	5
<i>Lupinus bicolor</i>	miniature lupine	4
<i>Nassella lepida</i>	foothill needlegrass	3
<i>Eriodictyon trichocalyx</i>	hairy yerba santa	2
<i>Eriogonum fasciculatum</i>	California buckwheat	4
<i>Lepidospartum squamatum</i>	scalebroom	2
Total Bulk Lbs. of Seed		30

Should the percent purity and germination of each species not be available at the time of ordering, the Restoration Ecologist shall approve any variation on seed purity and germination presented by the Installation Contractor. All species substitutions must be approved by the County, USACE, USFWS, CDFW, and Restoration Ecologist.

4.8 Identification of Planting Areas

When the final plans for the restoration in the mitigation areas have been approved, the RE will determine planting locations of live stakes, propagated plants, and native seed based on micro-topography, hydrologic conditions, and current vegetation communities on site. The RE will demarcate planting locations that mimic the surrounding natural landscape using brightly colored pin flags where live stakes and propagated plants will be installed.

4.9 Container Plant and Seed Procurement

Container plant and seed procurement for all the onsite mitigation areas, excluding the temporary impact areas, DG-W-1, DG-W-2, DG-W-2 Outlet, DG-SF-1, DG-SF-2, DG-2 New Channels, DG-2 WOUS, DG-4-WOUS Connections, and DG-4A, will commence concurrently with the initiation of the initial weed removal and grow and kill program (Phase 1). Container plant and seed procurement for these excluded areas will commence in Phase 2 for DG-W-1, DG-W-2, DG-W-2 Outlet, DG-SF-1, DG-SF-2, DG-2 New

Channels, DG-2 WOUS, DG-4-WOUS Connections, and DG-4A, and in Phase 3 for the temporary impact areas.

Plant material will originate from local sources as is feasible, ideally within the Arroyo Seco and adjacent watersheds originating in the San Gabriel Mountains; however, sources can range from the San Gabriel Mountain range and Los Angeles Basin south to Orange County and east to western Riverside County. Materials should be obtained from areas that have habitat conditions that are similar to those within the Project area. Commercially produced seed will be acceptable for certain species, as determined by the RE.

4.9.1 Container Plant Procurement

Container plant materials will be obtained from a qualified native plant nursery experienced in the propagation of native plants species. Container plants will have container sizes no less than one gallon, with the exception of wetland species which can be procured as plugs (e.g. Ray Leach Cone-tainers™). Container plant species will be procured based on the approved planting palette for each vegetation community. Any species of container plant that is not available during Phase 1 of mitigation implementation will be procured and installed during Phases 2 and 3 of mitigation implementation. In addition, if the number of container plants specified in the planting palette are not available during Phase 1 of mitigation implementation, the additional number of plants will be procured and installed during Phases 2 and 3 of mitigation implementation.

4.9.2 Seed Procurement

Native seed materials will be obtained from a qualified seed vendor experienced in native seed collection. The native seed mix will be ordered according to the specifications in this Plan. Seeds will be cleaned to a commercially acceptable grade, tested, and labeled with the species name, weight, purity, germination rate, and geographic origin. The RE will inspect the seed mix tags of all deliveries of seed to assure that they are up to specifications (i.e., source[s], percent germination, and purity of seed). Seed quality will be the best obtainable in the year of application for both purity and germination and any seed being stored for future use within the Project area will be kept in a cool, dry place until site application. Any species of seed that is not available during Phase 1 of mitigation implementation will be procured and applied during Phases 2 and 3 of mitigation implementation. In addition, if the number of pounds of seed specified in the seed mix are not available during Phase 1 of mitigation implementation, the additional number of pounds of seed will be procured and applied during Phases 2 and 3 of mitigation implementation.

4.10 Willow and Mulefat Cuttings/Stakes

Suitable local donor areas will be identified within Devil's Gate Reservoir by the RE. Dormant pole cuttings from appropriate species may provide a large percentage of the plant material used for the proposed mitigation areas. To ensure establishment success, cuttings will be harvested from live, dormant plants (i.e., willows) either in late fall, winter, or very early spring before the buds start to break. Pole cuttings to be installed during Phase 1 of mitigation implementation will be harvested in the fall prior to the start of sediment removal activities. To the extent possible, these pole cuttings will be harvested from the permanent impact area of the Project. Pole cuttings to be installed in Phases 2 and 3 of mitigation

implementation will be harvested at other suitable local donor areas within or adjacent to the Project area. Willow stakes will be approximately four to five feet long and from one to two-inch diameter at their base, as vigorous young stakes with larger diameters establish more readily and successfully than older or small diameter stakes. A diagonal cut will be made at the base of each stake and the top will be cut horizontally to differentiate the rooting end from the above ground end to aid in installation. Lateral branches will also be removed during harvesting. The willow stakes will be stored (no longer than two weeks) in buckets filled with water and in a cool shaded location until ready for planting.

Immediately prior to installation, the stakes may be dipped in a rooting hormone and then installed in pre-watered holes approximately two to four feet deep or with more than half of the cutting underground. Appropriate installation areas will be determined by the RE and marked with brightly colored pin flagging. The holes will be backfilled and the soil around the stake tamped-in to ensure good soil to stem contact and no air pockets. The willow stakes will be watered immediately following installation. All cuttings will be provided with an emitter from the irrigation system.

4.11 Container Planting Methods

Container plant installation for all of the mitigation areas, excluding DG-1, the temporary impact areas, DG-W-1, DG-W-2, DG-W-2 Outlet, DG-SF-1, DG-SF-2, DG-2 New Channels, DG-2 WOUS, DG-4-WOUS Connections, DG-4, and DG-4A, is anticipated to commence in the late fall to early winter of 2018 following initial weed removal activities (Phase 1). Container plant installation for DG-W-1, DG-W-2, DG-W-2 Outlet, DG-SF-1, DG-SF-2, DG-2 New Channels, DG-2 WOUS, and DG-4-WOUS Connections will commence following the completion of grading and/or re-contouring in these areas (Phase 2). Container plant installation for DG-4 and DG-4A will commence following the completion of the grow and kill program, as determined by the RE (Phase 2). Phase 2 container planting is anticipated to occur during the fall and winter from January 2019 to February 2020. Container plant installation for the temporary impact areas will occur in the fall or winter following sediment removal in the temporary impact area which is currently scheduled for Year 3 of the initial sediment removal effort (Phase 3).

Each phase of container plant installation should occur in the fall or winter, between October and January, ideally following the first major rain event for the season. If planting must occur after February 15, then nesting bird surveys will be conducted in the planting area and adjacent buffer areas (see Section 4.16.3 for additional detail about nesting bird survey requirements). To the extent possible, planting of container plants should not occur later than March 1 since climate patterns will not be as conducive to plant establishment as compared to planting during fall or winter. Prior to installation, all plant material will be inspected by the RE to ensure that container stock is healthy and does not show signs of having pests or disease. If any container stock is in poor condition, it will be rejected by the RE.

Container plants will be planted using standard horticultural practices. Planting holes for all container plants, except oak trees, will be dug to a width twice the size of the rootball and to a depth slightly deeper than the depth of rootball so that the root crown is one inch below grade following installation. Oak trees will be planted in a manner that the root crown is 0.5 to one inch above grade following installation (after soil settles following watering). Prior to installation, all plants will be thoroughly watered in their containers and the soil in planting holes will be wetted with a minimum of one gallon of water. Planting

holes will be backfilled with native soil and irrigation basins will be formed around the base of each planting. Basins will be a minimum of two feet wide and have a ridge no less than four inches. Rocks greater than two inches in diameter will be removed to the extent possible from the backfill soil and fertilizer will not be added to backfill. Soil will be tamped-in by hand to collapse air pockets in the backfill. All container plants will be irrigated with a minimum of one gallon of water immediately following installation and basin creation. Container plants will be planted in ecologically appropriate locations throughout the site and as directed by the RE.

4.12 Seeding Methods

Seeding with native propagules will be performed after initial weed removal activities, earthwork, installation of irrigation systems, installation of structural habitat features, and container plant/pole cutting installation has been completed for each mitigation area and will occur during all three phases of mitigation implementation. Seed application is anticipated to occur in January 2019 for Phase 1 and during the fall and winter from December 2019 to January 2020 for Phase 2. Seed application for Phase 3 will occur in the fall or winter following container plant/pole cutting installation, which is dependent on the completion of sediment removal in the temporary impact areas. Native seed mixes will be applied using a combination of hydroseeding and hand seeding methods appropriate for each location throughout the site. Seed will be applied between October 1 and November 30 or potentially into the December/January timeframe in order to take advantage of natural rainfall throughout the wet season.

4.12.1 Hydroseeding

Hydroseeding will occur for mitigation areas large enough to be accessed by a hydroseed rig. Hydroseeding will occur in these areas following initial weed removal activities, earthwork, installation of irrigation systems, and container plant/pole cutting installation. Hydroseeding should occur in the fall or winter, between October and January, to take advantage of natural rainfall. To the extent possible, container plants and pole cuttings will be avoided during hydroseed application. Hydroseeding will consist of a one-step hydraulic application of a slurry mixture container water, organic soil stabilizer, cellulose wood fiber, and the seed mixtures specified in Section 4.7.1 of this plan. Fertilizer will not be added to the hydroseed mix.

4.12.2 Hand Seeding

For areas that have an abundance of well-established native habitat, or cannot be accessed by the hydroseed rig, hand broadcasting of seed will be employed. Hand seeding will occur in these areas following the initial weed removal activities, earthwork, installation of irrigation systems, and container plant/pole cutting installation. Hand seeding will occur in the fall or winter, between October and January, to take advantage of natural rainfall. Broadcast seeding will be completed using hand-crank spreaders or simply by-hand. The use of a dispersal agent will not be employed during hand seeding. Seed will be applied evenly throughout each mitigation area and incorporated into the soil to a depth of approximately 0.5 inches using metal hand rakes. Fertilizer will not be added to the seed mix. Due to the presence of native vegetation and limited accessibility, the use of an imprinting machine will not be

employed. Incorporating the seed into the soil using hand rakes should provide appropriate pockets where seed can germinate.

4.13 Erosion Control Measures

All proposed mitigation areas are located within floodplains and may be susceptible to flooding and erosion during stormwater events. Erosion control measures will be installed and maintained per applicable permit conditions (i.e., Storm Water Pollution Prevention Plan) and as appropriate and practicable to avoid increased erosion and/or sedimentation. Best Management Practices (BMPs) may include one or more of the following techniques: fiber rolls, jute netting, silt fencing, and straw or willow wattles. All materials shall be weed-free and subject to approval by the RE prior to purchase and/or installation. Silt fencing will be monitored regularly and removed or replaced prior to the point when its integrity is compromised (i.e., pieces begin to shred and break off). Straw wattles with plastic mesh will only be used as a temporary measure and must be removed once erosion control is no longer needed.

4.14 Biological Monitoring

Biological monitoring will be performed when mitigation activities are conducted during the breeding bird season (typically from February 15 through August 15) to prevent Project-related impacts to birds nesting within the work areas or immediately surrounding areas, in accordance with the Migratory Bird Treaty Act (USFWS 1918, as amended). Raptors can begin breeding activity, including nest building, as early as December. A survey for nesting raptors will be conducted in work areas adjacent to mature oaks, eucalyptus, and riparian trees prior to restoration activities that produce noise. In certain cases, it will be necessary to establish a no-work buffer. Monitoring will also be performed if detection of a special-status species is located within or immediately adjacent to work areas and there is a potential for Project-related impacts to occur to that species. A qualified biologist will perform the biological monitoring to ensure Project-related impacts do not occur to these sensitive biological resources. The biologist will also help enforce the regulations and recommendations pertaining to biological resources in the Project permits and agreements in order to maintain Project compliance with these documents. A daily monitoring log will be maintained, and the biologist will record all wildlife species, with special attention paid to special-status species, and construction activities monitored each day. The biologist will communicate with the appropriate Project personnel regarding the planned activities and any noncompliance issues observed during monitoring.

4.15 120-Day Plant Establishment Period

Following the installation of container plants, the RE will perform an inspection of each mitigation area. During the inspection, the RE will document any issues or outstanding items that need to be addressed by the RC. Once the RC has addressed any issues or outstanding items, the RE will prepare an As-Built Plan and notify LACFCD and regulatory agencies that initial mitigation activities have been completed in accordance with all applicable plans and permits. At this point, the 120-day Plant Establishment Period (PEP) will commence. Because mitigation implementation is anticipated to be conducted in three phases over multiple years, there will be multiple 120-day PEPs, dependent on when each mitigation area is planted.

During the 120-day PEP, the RC will provide regular maintenance of all mitigation areas. Maintenance will include tasks such as inspection of irrigation system, nonnative plant control, erosion control, pest control, dead plant replacement, and trash removal. The contractor will make general irrigation system checks once a month during this period.

During the 120-day PEP, the RE will visit each site at a frequency of once per month to conduct horticultural assessments. During these assessments, the RE will record moisture levels, condition of planted areas, erosion issues, signs of herbivory, insect damage or disease, and signs of anthropogenic disturbance. The RE will prepare an e-mail memorandum for LACFCD following each monitoring visit to provide a summary of the restoration site conditions, recommended remedial measures if issues are observed, and the results of any remedial work performed by the RC. Three weeks prior to the end of the 120-day PEP, a site walk through will be conducted by the RE so that a punch-list of outstanding items can be prepared for the RC. The RC will address all items on the punch-list prior to the end of the 120-day PEP. At the end of the 120-day PEP, a final site walk through will be conducted with LACFCD, the regulatory agencies, and the RE to verify that all punch-list items were addressed by the RC. If any punch-list items are determined to have not been addressed prior to the final walk through, the RC will have an additional two weeks to complete those items. The RE will verify when outstanding items are completed and will notify LACFCD and regulatory agencies that the 120-day PEP is complete and request approval to enter into the 5-year maintenance and monitoring period for the riparian areas and the 10-year maintenance and monitoring period for the upland areas.

4.16 Avoidance Measures

4.16.1 Contractor Education

An onsite, pre-construction meeting will be held prior to the commencement of restoration activities to identify sensitive areas and other sensitive resources that may be within or adjacent to the Project areas. All personnel working on the Project will attend at least one contractor education session that will be presented by the RE or another authorized biologist working on the Project. Contractor education will include topics such as roles and authority of the Biological Monitors, location of designated access routes, special status species that have the potential to occur within or near the Project area, what to do if a special status species is seen, limits of work, and permit obligations. The RE will provide a copy of this Mitigation Work Plan and any pertinent landscape construction documents to each contractor, along with copies of pertinent resource agency permits.

4.16.2 Preparation of a Nesting Bird Management Plan

A site-specific Nesting Bird Management Plan will be prepared that includes detailed methodologies and definitions that will allow a qualified biologist to monitor and implement nest-specific buffers based on topography, vegetation, species, and individual bird behavior. A Nest Log will be developed that will allow the tracking of each active nest and the ultimate outcome. This plan will be implemented to ensure the protection of common and sensitive bird species during construction and mitigation activities that occur are conducted in the breeding season.

4.16.3 Nesting Bird Surveys

If vegetation removal, mitigation implementation, or maintenance activities are conducted during the nesting bird season (February 15 through August 31), pre-construction nesting bird surveys will be conducted within one week prior to the start of the activities. A minimum of three surveys will be conducted on separate days to determine if least Bell's vireos or southwestern willow flycatchers are nesting within 500 feet of Project boundary with one survey being conducted one-day prior to the initiation of the activities. If no nesting activities are observed within 500 feet of the Project boundary, then vegetation removal, mitigation activities, or maintenance will be allowed to commence. If least Bell's vireo or southwestern willow flycatcher are observed nesting within the 500 feet, then nest monitoring will be initiated, and vegetation removal or other work activities will not be allowed to occur until the Designated Biologist establishes an appropriate nest buffer. Upon observation of nest building, completed nest(s), egg laying, incubation, hatchlings, fledglings, or attempted territory establishment activities around the nest, the Designated Biologist shall establish a buffer within 300 feet of the nest until the young have fledged and no additional signs of nesting are observed or if the nest fails, as determined by the Designated Biologist. The Designated Biologist will report the results when the nest is either completed or it fails to the USFWS and CDFW and work will not be allowed to proceed within the 300-foot nesting buffer until the USFWS provides their approval to proceed. The biologist conducting the survey will be a trained ornithologist with at least 40 hours of supervised experience locating vireo and mapping locations in the field. The biologist conducting surveys for southwestern willow flycatcher must hold the appropriate permits to conduct surveys for this species. If nest monitoring is required, then the biologist who conducts the monitoring must hold the appropriate permits to conduct nest monitoring for least Bell's vireo and southwestern willow flycatcher. The resumes for the biologists and monitors will be submitted to the USFWS for approval at least 7 days prior to initiation of surveys.

4.17 Additional Measures

4.17.1 Signage

Signage will be used to identify restoration areas, trails, and off-limits areas and interpretive signs will be placed at strategic locations to inform the site users about the importance of the mitigation areas and the habitat restoration activities. The trails and the proposed sign locations are shown on Figure 4-1. The sign locations include the following:

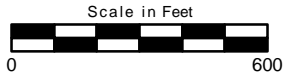
- On the west side of the Arroyo Seco where the main equestrian trail crosses the channel;
- On the west side of the Arroyo Seco at the junction of the main road to the Oak Grove Park parking lot dead ends near the mining pit;
- On the southwest side of the Project Area at the overlook;
- On the east side of Devil's Gate Dam where the access road enters the Reservoir;
- On the east side of the Reservoir near the location of the Lower Altadena Drain; and,
- On the east side of the Arroyo Seco adjacent to the mitigation area in Johnson Field.



**Figure 4-1
Proposed Trail Map**

- Map Features**
- Initial Sediment Removal Footprint ¹
 - Permanent Maintenance Footprint ¹
 - Arroyo Seco Trail
 - Seasonal Trail
 - Barriers to Access
 - Proposed Sign Location
- Mitigation Areas**
- DG-1
 - DG-1 WOUS
 - DG-2
 - DG-2 New Channels
 - DG-2 WOUS
 - DG-2A
 - DG-2B
 - DG-3A
 - DG-4
 - DG-4 Drainage
 - DG-4 Sheetflow
 - DG-4 WOUS
 - DG-4 WOUS Connections
 - DG-4A
 - DG-4B
 - DG-4C
 - DG-5
 - DG-7 (Temp Impacts)
 - DG-8 (Temp Impacts)
 - DG-9 (Temp Impacts)
 - DG-SF-1
 - DG-SF-2
 - DG-W-1 (Johnson Field)
 - DG-W-2 (Mining Pit)
 - DG-W-2 (Mining Pit Outlet)

Location: N:\2014\2014-003-008 Devils Gate Sediment Removal Project\maps_and_analysis\2017-04-13_Trails\DG_Approved_Trails_V3.mxd (MAG)mguidry 7/31/2018



LACFCD will work with the City to establish consistent interpretive signage and other signage for the sediment removal Project and the restoration areas. The proposed signage plan will be consistent with the City's current standards. The signs will be installed within 60 days of Project initiation.

4.17.2 Public Education and Outreach

Public education and outreach is an essential component of the Restoration Plan because the reservoir area is highly used by the public and it is an important natural area that is enjoyed by site users. LACFCD understands the importance of the area and that it is highly valued by hikers, bird watchers, equestrians, and other interested user groups. In addition, LACFCD also realizes the importance of the site users as stewards of the site and will work with the City and site users to identify issues or problems at the site, such as blockages of preserved trails by fallen trees, erosion of preserved trails, or trash dumping. Periodic presentations and updates will be provided to the agencies, the City, and to advisory groups, such as the Hahamongna Watershed Park Advisory Committee, Arroyos & Foothills Conservancy, and the Altadena Crest Trail Restoration Working Group and the local community, to brief them on the ongoing restoration activities and the status of the Project.

Other community outreach opportunities may include involving school groups or participants in the Tom Sawyer Camp with habitat restoration activities, wildlife inventories, nature walks, or trails cleanup. The program would be developed with input from the City, the community, and site users. Students would be encouraged to fulfill their requirements for volunteer activities through assistance with tasks such as trails cleanup, for example.

Additional outreach opportunities might include hiring staff from the local workforce to assist with invasive plant removal, trash removal, and other habitat restoration activities. This program would need to be developed but hiring local people would help support the City and its residents.

4.17.3 Installation of Trash Entrapment Device at West Altadena Storm Drain

If necessary and depending upon the configuration and operation of the Lower Altadena Drain, LACFCD may work with the City to develop and implement a plan to install and maintain a trash entrapment device at the West Altadena Storm drain. A significant amount of trash enters the Arroyo Seco from surrounding communities and particularly at the Lower Altadena Storm Drain, located on the east side of the reservoir. Entrapment and removal of the trash before it enters the Arroyo Seco will decrease the total amount of trash that ends up in the downstream areas and will greatly improve the water quality.

4.17.4 Vector Control

LACFCD will work with the City and San Gabriel Valley Mosquito and Vector Control District (Vector Control) to develop and implement a vector control program onsite. Standing water is not a goal of the restoration activities in the mitigation areas. However, there is a potential that low spots may naturally develop and temporarily hold water in some of the mitigation areas. LACFCD has an on-going contract with Vector Control to treat their facilities to control the mosquitos and to minimize the spread of disease via mosquitos and other vectors. Vector Control will utilize control methods that are safe in areas where sensitive or listed species of aquatic and terrestrial wildlife occur to avoid harming those species, including

the least Bell's vireo. Vector Control will not be allowed to cut any vegetation to gain access to areas that need treatment. The LACFCD will ensure that low areas that temporarily hold water are accessible to Vector Control so they can treat the areas for mosquitos and other vectors without the need to cut vegetation and to avoid harming sensitive wildlife. In the event that Vector Control needs to conduct treatments during the breeding season, LACFCD will have a Qualified Biologist, who is familiar about the locations of nesting birds and nesting least Bell's vireos, accompany Vector Control through the mitigation site.,

5.0 MAINTENANCE PLAN

At the conclusion of the 120-day establishment period for each mitigation area, the maintenance period for the onsite mitigation areas will commence. The maintenance period is anticipated to vary between five and ten years for some of the mitigation areas as the implementation of the mitigation may be staggered due to the need to conduct multiple rounds of nonnative plant species removal in some mitigation areas. In addition, the impacts to some of the temporary impact areas may occur early in the Project implementation while others may occur near the end of the sediment removal process. The maintenance period will be clearly documented for each of the mitigation areas. Maintenance of the mitigation areas will be performed in accordance with all Project permits and requirements until established performance standards have been achieved. Maintenance tasks include, but are not limited to, irrigation, irrigation system maintenance, nonnative plant control, remedial measures, erosion control, trash removal, and site protection.

5.1 Maintenance Schedule

The timing and frequency of most maintenance tasks will be determined by site-specific conditions (e.g., nonnative plants, irrigation requirements), recommendations from the RE, and established performance standards. A tentative schedule for typical maintenance tasks is provided in Table 19.

Table 19. Maintenance Schedule	
Time Frame	Activity
Year 1	
Twice per month (May-Aug)	Site Irrigation
Monthly (Sept-May)	
Every two months	Irrigation System Maintenance
Quarterly (minimum) or As Necessary	Weed Abatement/Invasive Plant Control
As Required (Dec-Feb)	Supplemental plantings
As Required	Maintenance of site protection measures
Years 2-5	
As-needed	Site Irrigation*
As-needed	Irrigation System Maintenance
Quarterly or As Necessary	Weed Abatement/Invasive Plant Control
As Required (Dec-Feb)	Supplemental plantings
As Required	Maintenance of site protection measures

Table 19. Maintenance Schedule	
Time Frame	Activity
Years 6-10 (if necessary)	
As-needed	Site Irrigation*
As-needed	Irrigation System Maintenance
Quarterly or As Necessary	Weed Abatement/Invasive Plant Control
As Required	Maintenance of site protection measures

*Irrigation will be suspended accordingly in riparian and upland sites so that these sites are off of irrigation for two years prior to being signed off as successful

5.2 Irrigation

During the first year following initial planting, container plants and pole cuttings will be irrigated at least twice per month if the areas have not received sufficient rainfall. However, the frequency of irrigation may need to be adjusted based on site conditions and climatic conditions. The Maintenance Contractor will verify that all container plantings have received sufficient water during each irrigation event. The RE will conduct periodic checks to also verify that sufficient water has been applied during irrigation. Following the first year of the maintenance period, the RE will annually assess each mitigation area to determine whether supplemental irrigation will continue or if it is no longer required.

The Maintenance Contractor will be responsible for the regular maintenance and repair of the irrigation system. General system checks will be made at least every month from April to November, and as needed at other times of the year, to ensure the system is operating efficiently and that container plants are receiving adequate water. The RE will also verify that the irrigation system is operating correctly during periodic monitoring events. Once the RE has determined that supplemental irrigation is no longer required, all aboveground parts of the irrigation system will be removed from the mitigation areas. Irrigation of the mitigation areas should occur for a period of no more than three years following container plant and pole cutting installation.

5.3 Nonnative Plant Management

5.3.1 Invasive Plants

All nonnative invasive plants ranked as High or Moderate in the California Invasive Plant Inventory (Cal-IPC 2006) will be controlled and suppressed during the maintenance period. A concerted effort will be made to eradicate invasive species that were present prior to implementation. Control of these species within the mitigation areas, the routine annual maintenance area, and the episodic maintenance area will be an ongoing task throughout the five to ten-year maintenance period. The management of perennial pepper weed infestations within the Reservoir will be a multi-year endeavor to achieve adequate control. A combination of hand tools, weed whips, and/or herbicide will be used during invasive weed abatement activities with the purpose of eliminating invasive weeds prior to flower and seed production. Invasive weeds adjacent to installed container plantings and existing native plants will be removed by hand without the use of herbicide. Portions of invasive weeds that remain in the ground after cutting has occurred will be treated with herbicide, a technique known as the cut and spray method. All cut or hand

removed plant material will be collected, removed from the mitigation areas, and disposed of at an appropriate facility located outside of the Project site. The required level of effort for invasive weed management will be determined by annual monitoring results and the current status of site performance standards. All control methods will be implemented according to requirements and restrictions addressed in the Mitigation Work Plan (Section 4.4.1).

5.3.2 General Weed Control

In addition to the control of all invasive nonnative plants, other nonnative annual and perennial plants will be controlled in the mitigation areas and on the side slopes (EMA) of the PMA to reduce competition with natives. A combination of hand tools, weed whips, and/or herbicide will be used to achieve this task with the goal of eliminating weeds before they mature and/or produce flowers. Nonnative weeds adjacent to installed container plantings and existing native plants will be removed by hand without the use of herbicide. All cut or hand removed plant material will be collected, removed from the mitigation areas, and disposed of at an appropriate facility located outside of the Project site. All control methods will be implemented according to requirements and restrictions addressed in the Mitigation Work Plan (Section 4.4.1).

If the mitigation areas develop a dense growth of annual nonnative grasses or herbs, string-trimmers will be used to cut down plants before production of flowers. The RE and Maintenance Contractor will determine whether or not follow-up application with herbicide is necessary. If flowering parts are present, all cut material will be collected, bagged, removed from the restoration site, and disposed at an appropriate facility located outside of the Project site.

5.3.3 Weed Control in the PMA

In addition to the control of all invasive nonnative plants, other nonnative annual and perennial plants in the mitigation areas and on the side slopes of the PMA, the Maintenance Contractor will also be responsible for conducting removals in the remainder of the PMA, which includes the 42.06 acres where the annual sediment removals will occur. Even though the native vegetation will be removed from the areas where sediment is initially removed and where annual sediment removals will occur, the growth of nonnative and invasive plants and weeds can be detrimental to the adjacent mitigation areas. The initial vegetation removal in the PMA will be conducted between November 2018 and end of January 2019. Following the initial vegetation removal, much of the area in the PMA will sit idle until the construction contractor begins sediment removals in April of 2019. In addition, the construction contractor will begin removing sediment at the dam and will work upstream so some areas of the PMA will likely support the growth of nonnative and invasive species until the sediment is removed. Therefore, the Maintenance Contractor will be responsible for removing nonnative and invasive plants and weeds in the areas where the Construction Contractor is not actively removing sediment. Following the completion of the initial sediment removal project (1.7 mcy), the Maintenance Contractor will be responsible for controlling the nonnative and invasive plants and weeds in the entire 42.06-acre PMA. A combination of hand tools, weed whips, and/or herbicide will be used to achieve this task with the goal of eliminating weeds before they mature and/or produce flowers. All cut or hand removed plant material from invasive plants will be collected, removed from the PMA, and disposed of at an appropriate facility located outside of the Project

site. All control methods will be implemented according to requirements and restrictions addressed in the Mitigation Work Plan (Section 4.4.1).

If the areas within the PMA develop a dense growth of annual nonnative grasses or herbs, string-trimmers will be used to cut down plants before production of flowers. The RE and Maintenance Contractor will determine whether or not follow-up application with herbicide is necessary. If flowering parts are present, all cut material will be collected, bagged, removed from the PMA, and disposed at an appropriate facility located outside of the Project site.

5.4 Maintenance of the Side Slopes

The maintenance activities related to sediment removal and repair of the side slopes will only occur after large storm events that damage portions of the side slopes or when erosion compromises a section of the side slopes. The maintenance activities will be limited to the locations where sediment has accumulated and will only consist of the removal of accumulated sediment and repair of the side slopes. The vegetation buried by sediment may be removed during recontouring. The LACFCD does not anticipate that all 7.34 acres of the side slopes will need to be repaired in the same season or that repair will be necessary on a frequent basis. The primary purpose of the side slope maintenance is not to remove vegetation, but only to repair the sides slopes so they can revegetate with native plant species.

Regular maintenance on the side slopes will include the removal of nonnative and invasive plant species to limit the spread of these species into the mitigation site. This maintenance will be conducted at the same time that maintenance activities are conducted in the mitigation site. Maintenance will typically occur on a quarterly basis and will include the use of string-trimmers, herbicides, and hand-pulling of weeds near native plants. A Restoration Monitor will be present during the maintenance activities in the mitigation site and on the side slopes. The intended vegetation on the side slopes is a mix of riparian scrub (mulefat and other shrubby species) and RAFSS, which will provide foraging opportunities for least Bell's vireo and other wildlife species and will create a buffer between the annual maintenance area and the mitigation site. The Restoration Monitor will ensure that the Landscape Contractor's crew only remove plant species that are appropriate for removal.

If recontouring of any portion of the sides slopes is necessary, the Restoration Specialist will evaluate the need to reseed the side slopes after the recontouring is completed. The vegetation that grows on the side slopes is expected to provide a good seed bank in the soils so after the recontouring is completed, the nonnative and invasive plant species will be controlled to allow the native plants to revegetate naturally. If the vegetation on the side slopes does not successfully germinate and grow, then reseeding of the sides slopes may be conducted. The Restoration Specialist will monitor the repaired portions of the sides slopes to evaluate if reseeding is necessary and when it would be appropriate.

5.5 Pest Control

The RE and Maintenance Contractor will monitor the mitigation areas for signs of insects, diseases, or herbivory of container plants. Plants that are severely diseased or infested with insects may be removed and replaced. Although not required, if exclusionary fencing or plant cages become necessary and are installed to protect container plants, they will be monitored and repaired or replaced if damaged. Existing

cages around installed container plants will be removed or enlarged, as appropriate, if the plants begin to outgrow them or the RE determines the plantings can survive without protection.

5.6 Supplemental Planting and Seeding

In the event established Project performance standards (e.g., native plant cover) are not being met, the RE may direct the Maintenance Contractor to install additional container plants or perform additional seeding. In addition, any species of container plant and/or seed that is not available during Phase 1 of mitigation implementation will be procured and installed/applied during Phases 2 and 3 of mitigation implementation. Also, if the number of container plants specified in the planting palette and/or the number of pounds of seed specified in the seed mix are not available during Phase 1 of mitigation implementation, the additional number of plants and/or additional pounds of seed will be applied during Phases 2 and 3 of mitigation implementation. Replacement plantings, seeding, and installation practices will follow requirements and restrictions as addressed in the Mitigation Work Plan (Section 4.7).

5.7 Trash and Debris Removal

Trash, and debris that may compromise the success of the restoration areas, will be removed from the mitigation areas, including trash brought in by storm flow, during regularly scheduled maintenance activities throughout the 10-year maintenance period. The contractor will exercise care so that trash removal activities minimize or avoid impacts to cuttings or established native vegetation in the mitigation areas. Trash will be removed from the areas and disposed of in a landfill.

5.8 Erosion Control

Erosion control measures that have been installed will be monitored and repaired throughout the maintenance period. If the RE identifies any new erosion issues, additional temporary, low-impact erosion control measures may be installed. Once it has been determined by the RE that there is sufficient vegetation established within the mitigation areas, the temporary erosion control devices will be removed.

5.9 Site Protection

Existing site protection (e.g., exclusionary fences, barriers, signs) will be monitored and repaired throughout the maintenance period. If unauthorized access into the mitigation areas occurs, the RE will consult with LACFCD to determine if additional site protection measures are required.

5.10 Tree Trimming within Existing Easements

LACFCD will coordinate with the existing easement holders about the timing and the extent of tree trimming that may be required within the existing easements. If the easement holders determine that tree trimming is necessary during the nesting season, the LACFCD will implement all of the same mitigation measures and avoidance and minimization measures that are required during sediment removal and habitat restoration activities. These measures include pre-construction surveys, focused surveys for least Bell's vireos and other nesting birds and monitoring during construction and habitat restoration activities. The purpose of the surveys and monitoring is to ensure that least Bell's vireo and other nesting birds are not affected by any activities being conducted in the sediment removal area or the mitigation areas. In

addition, monitoring during tree-trimming activities will be conducted by LACFCD to ensure that the easement holders do not affect nesting birds or do not unnecessarily damage the habitats in the mitigation site.

6.0 ECOLOGICAL PERFORMANCE STANDARDS

This section defines a set of annual performance standards, or success criteria, for evaluating the successful restoration of native habitat within the proposed onsite mitigation areas. These performance standards are observable or measurable physical, hydrological, and biological attributes that will be used to determine if the proposed mitigation areas are meeting established objectives. These standards will also be used to gauge when and to what extent remedial measures will be required to ensure the success of the areas.

The performance standards will be measured on an annual basis beginning in the spring or summer following initial mitigation activities in the mitigation areas. All mitigation areas will not be implemented at the same time based on the Project schedule. Site performance standards are dependent on the mitigation type (creation, restoration, or enhancement) and the target vegetation community. If the performance standards are not achieved in 5 years for the riparian mitigation areas and ten years for the upland mitigation areas, then monitoring and adaptive management measures (if applicable) will continue until the performance standards are met. Table 20 shows the performance standards and each standard is described briefly below.

Table 20. Performance Standards and Descriptions		
Category	Performance Standard	Description
Physical-1	Structural Patch Richness	The site must contain target % or more of the number of structural patch types found at the selected reference site.
Physical-2	Sediment/Topographic Stability	Formation of substantial rills and gullies is minimized and normal sheet flow during inclement weather does not cause substantial sediment transport to lower elevations.
Fauna-1	Wildlife Use Monitoring	Target riparian/aquatic wildlife species present within the boundary of mitigation site, including approved buffer, equal to at least 80% of reference site by year 5.
Flora-1	Survivorship ¹	Tree, shrub, and herb strata container plants will have the following survival requirements: Year 1 – 90% Survival Year 2 – 85% Survival Year 3 – 80% Survival Year 4 – 80% Survival Year 5 – 80% Survival

Table 20. Performance Standards and Descriptions

Category	Performance Standard	Description
Flora-2	Native Plant Cover	<p>Combined tree, shrub, and herb strata container plants will have the following native plant cover requirements:</p> <p style="text-align: center;"><u>Least Bell's Vireo Habitat</u> Year 1 – 20% Cover Year 2 – 30% Cover Year 3 – 40% Cover Year 4 – 55% Cover Year 5 – 100% Cover ²</p> <p style="text-align: center;"><u>Other Riparian Habitat Mitigation Areas</u> Year 1 – 20% Cover Year 2 – 30% Cover Year 3 – 40% Cover Year 4 – 55% Cover Year 5 – 75% Cover ³</p> <p style="text-align: center;"><u>Upland and RAFSS Habitat Mitigation Areas</u> Year 1 – 20% Cover Year 2 – 30% Cover Year 3 – 40% Cover Year 4 – 55% Cover Year 5 – 75% Cover ³</p> <p style="text-align: center;"><u>Oak Woodland Habitat Mitigation Areas</u> Year 1 – 10% Cover Year 2 – 20% Cover Year 3 – 30% Cover Year 4 – 40% Cover Year 5 – 50% Cover ⁴</p>
Flora-3	Nonnative Plant Cover	<p>Combined tree, shrub, and herb strata container plants will have the following native plant cover requirements:</p> <p style="text-align: center;"><u>Least Bell's Vireo Habitat</u> Not more than 5 percent for Year 1 – Year 5</p> <p style="text-align: center;"><u>All Other Habitat Mitigation Areas</u> Year 1 25% annual herbaceous species/grasses; 15% woody species/perennial herbs; 5% Cal-IPC Moderate or High Threat invasive species.</p> <p style="text-align: center;">Year 2 15% annual herbaceous species/grasses; 10% woody species/perennial herbs; 3% Cal-IPC Moderate or High Threat invasive species.</p> <p style="text-align: center;">Year 3 10% annual herbaceous species/grasses; 5% woody species/perennial herbs; 2% Cal-IPC Moderate or High Threat invasive species.</p>

Category	Performance Standard	Description
		<p>Year 4</p> <p>10% annual herbaceous species/grasses; 5% woody species/perennial herbs; 1% Cal-IPC Moderate or High Threat invasive species.</p> <p>Year 5</p> <p>10% annual herbaceous species/grasses; 5% woody species/perennial herbs; 0% Cal-IPC Moderate or High Threat invasive species.</p>
Flora-4	Native Plant Species Richness	By Year 5 the site must have 100% of the species present in the respective reference sites.

¹ If a volunteer or recruit of the same species originally planted is determined to be growing within a plant basin (or within one meter of that basin) with a dead plant, then that plant will count toward the survival total.

² Target of 100% of reference site for tree, shrub, and herb layers. The Year 5 cover standard for least Bell's vireo habitat will be based on results of vegetation sampling using the point-line intercept method (Elzinga et al. 2001) and the target should be 100% of the cover determined at the least Bell's vireo reference site.

³ The Year 5 cover standard for other riparian habitats is 75% of the reference sites and for upland and RAFSS habitat areas, the Year 5 cover standard will be based on 75% of the cover determined at the reference site for those habitat types. The 10 Year cover standard for the upland and RAFSS is 90% of the reference sites.

⁴ The Year 5 cover standard for oak woodland habitat areas will be based on 50% of the cover determined at the reference site and the 10 Year cover standard is 70% of the reference site.

6.1 Performance Standards




6.1.1 Physical

Structural Patch Richness

Structural patch richness is a measure of the number of different types of physical surfaces or features within a given site that may provide habitat for aquatic, wetland, or riparian species. This may include, but is not limited to debris wrack lines, cobbles/boulders, large woody debris, plant hummocks/sediment mounds, and/or standing snags. Structural patch richness will be evaluated every two years for all the previously established CRAM Assessment Areas (AAs) using the Riverine CRAM structural patch richness worksheet. Baseline conditions for the CRAM AAs were assessed in 2015 (Figure 6-1). In addition, the restoration of habitat for least Bell's vireo shall have a similar plant species diversity and structural composition as the least Bell's vireo reference site.

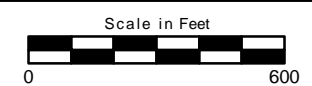
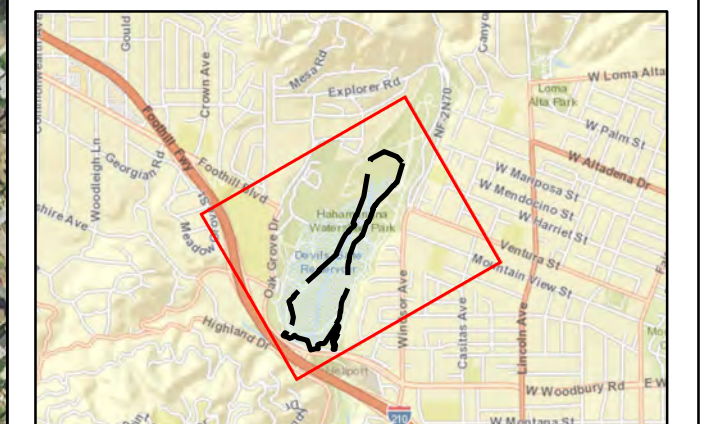


Figure 6-1 CRAM Assessment Areas

- Map Features**
-  Project Footprint
 -  Mitigation Areas
 -  CRAM Assessment Areas

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Sediment and Topographic Stability

Mitigation areas are meant to be graded, planted and seeded in a way that will maximize the ecological function of the site. If the surface topography is graded appropriately, rainfall will be able to infiltrate the soil and recharge mitigation areas with soil moisture. Additionally, grading of channels in appropriate locations throughout the site will convey larger volumes of runoff that originate from off site, or from sheet flow within the site. The site will be maintained and monitored so that substantial rills and gullies are not allowed to form and normal sheet flow during inclement weather does not cause substantial sediment transport to lower elevations.

6.1.2 Fauna

Wildlife Use Monitoring

The wildlife use within the mitigation areas and buffer habitats will be determined through a series of general biological surveys and focused surveys for special-status species. Over 48 acres of potentially suitable habitat for least Bell's vireo, a federally listed species, is anticipated within the mitigation areas. The wildlife use of the mitigation areas and the buffer habitats will be evaluated every three years and compared to the corresponding reference site in order to track the success of mitigation with reference to wildlife habitat quality. Monitoring methodology is detailed in Section 7.0.

6.1.3 Flora

Survival

Survival is a measure of how many container plants or willow or mulefat stakes installed have survived since initial installation. Survival will be evaluated annually to determine the number of surviving container stock and cuttings. Survival of plantings will be 95 percent at the end of Year 1, 90 percent at the end of Year 2, and 80 percent for Years 3 through 5. Should survival fall below the performance standard then supplemental planting will be required. Monitoring methodology is detailed in Section 7.0.

Native Plant Cover

Native plant cover is a measure of the percent aerial coverage of native plant species (tree, shrub, and herb strata) on a given site. Total native plant cover for each mitigation area will be evaluated on a yearly basis and compared to the corresponding target values determined at the reference sites in order to track the success of mitigation with reference to native vegetative cover. For the least Bell's vireo habitats in the mitigation site, an offsite reference site that is occupied by least Bell's vireo will be used to determine the target 5 Year performance standard for native plant cover. The values for percent cover of the native tree, shrub, and herb layers will be determined at the reference site in Year 1 of the implementation of the restoration project. The actual percent cover of native plants in each of the layers (tree, shrub, and herb) and the total overall cover used for the performance standard in the least Bell's vireo habitat in the mitigation site will be determined when the reference site is established. The target values for native cover will be 100 percent of the values determined at the reference site and those values will be used as the target throughout the interim management period. The 5 Year performance standard for the non-vireo riparian habitats is 75 percent of the reference sites. The 5 Year native cover performance standard for the

Quercus agrifolia Woodland Alliance is 50 percent of the reference site and the 10 Year cover standard is 70 percent of the reference site. The long-term goal for oak woodland would be to achieve 90 percent of the reference site. The Year 5 cover standard for the *Lepidospartum squamatum* Shrubland Alliance, *Eriogonum fasciculatum* Shrubland Alliance, and *Artemisia californica* Shrubland Alliance is 75 percent of the reference sites and the 10 Year cover standard is 90 percent of the cover determined at the reference sites. Monitoring methodology is detailed in Section 7.0.

Nonnative Plant Cover

Nonnative plant cover is a measure of the percent areal coverage of nonnative (exotic) plant species (tree, shrub, and herb strata) on a given site. Total nonnative plant cover for each mitigation area will be evaluated on a yearly basis and compared to the corresponding reference site in order to track the success of mitigation with reference to nonnative vegetative cover. The nonnative plant cover in least Bell's vireo habitat will be no more than five percent during Years 1 through 5. For all other habitats, the nonnative performance standards for Years 1 through 5 include: Year 1 – 25 percent annual herbaceous species/grasses; 15 percent woody species/perennial herbs; and 5 percent Cal-IPC Moderate or High Threat invasive species; Year 2 – 15 percent annual herbaceous species/grasses; 10 percent woody species/perennial herbs; and 3 percent Cal-IPC Moderate or High Threat invasive species; Year 3 – 10 percent annual herbaceous species/grasses; 5 percent woody species/perennial herbs; and 2 percent Cal-IPC Moderate or High Threat invasive species; Year 4 – 10 percent annual herbaceous species/grasses; 5 percent woody species/perennial herbs; and 1 percent Cal-IPC Moderate or High Threat invasive species; and Year 5 – 10 percent annual herbaceous species/grasses; 5 percent woody species/perennial herbs; and 0 percent Cal-IPC Moderate or High Threat invasive species. The monitoring methodology is detailed in Section 7.0.

Native Plant Species Richness

Native plant species richness is a measure of the number of different native plant species represented on a given site. Native plant species richness for each mitigation area will be evaluated on a yearly basis and compared to the corresponding reference site in order to track the success of mitigation. By Year 5 the site must have 100 percent of the species present in the respective reference sites. Monitoring methodology is detailed in Section 7.0.

6.2 Reference Sites

Reference sites will be established to define effective, objective, and realistic annual performance standard targets for the proposed onsite mitigation areas. These sites will be established in unimpaired habitats that most closely resemble those habitats targeted within each mitigation area. Figure 6-2 shows the anticipated locations of the reference sites but the actual placement of the reference sites will be determined at the start of the project.

Reference sites will be established for each vegetation community type targeted for mitigation. In addition, a separate reference site will be established in riparian habitat that is known to support the nesting activities of the least Bell's vireo. The actual locations of the reference sites will be established in conjunction with the initiation of mitigation activities, but the first monitoring of the reference sites will




not occur until the spring or summer following plant installation in the mitigation areas. The monitoring at the reference sites will include evaluating structural patch richness (riparian only), percent cover of native and nonnative plant species, native plant species richness, and wildlife use monitoring.

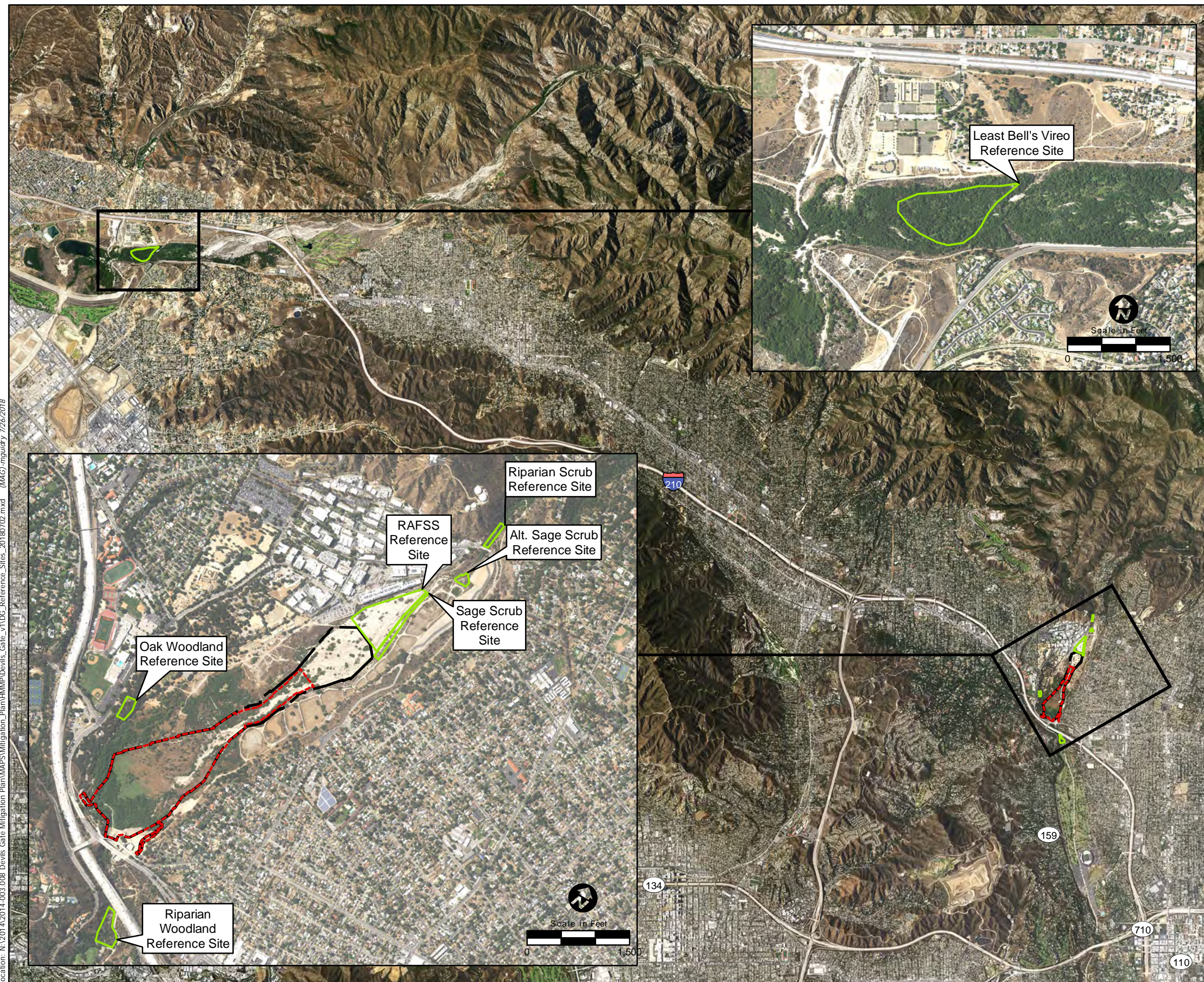
6.3 Non-Achievement of Performance Standards

If, after 5 years in the riparian mitigation areas and 10 years in the RAFSS and other upland mitigation areas, the performance standards have not been met in all or a portion of the mitigation areas, then the LACFCD will re-evaluate site conditions and implement additional mitigation offsetting measures (e.g., supplemental planting of native riparian vegetation, alteration of the flow regime) or pursue an alternative strategy (e.g., new location).

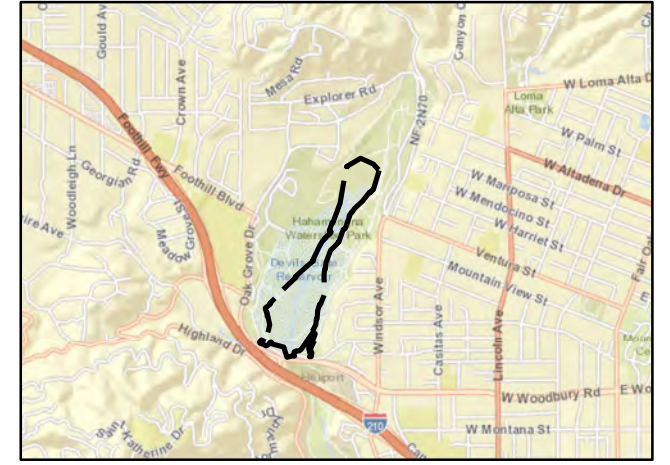
**Figure 6-2
Habitat Mitigation Reference Sites**

Map Features

-  Initial Sediment Removal Footprint ¹
-  Permanent Maintenance Footprint ¹
-  Reference Site



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7.0 MONITORING PROGRAM

The following is a description of the monitoring program intended to provide information on whether the proposed onsite mitigation areas are meeting annual objectives and established ecological performance standards. The information gathered during monitoring events will also be used to determine whether remediation or adaptive management is necessary to achieve site objectives. The following program includes monitoring frequency, duration, types of monitoring, methodologies, and reporting requirements.

Monitoring of each onsite mitigation area will be conducted using a combination of horticultural and botanical monitoring methodologies in addition to photo documentation. Relevant reference site conditions (i.e., botanical monitoring) will also be collected concurrently with mitigation area conditions to provide a standard in which local and regional changes in biological and environmental conditions can be taken into account. The monitoring program for the mitigation areas that support riparian habitat is intended to be a five-year program to meet the performance standards. For the RAFSS and the other upland communities, the monitoring program may be extended up to 10 years to meet the performance standards because the plant species in the upland communities tend to be slower growing than the plant species in the riparian communities.

7.1 Monitoring Methodology

Table 21 shows the monitoring schedule and each component is discussed individually below.

Table 21. Monitoring Schedule	
Activity	Time Frame
Horticultural Monitoring	120-day PEP - Monthly
	Year 1 - Monthly
	Years 2 and 3 - Quarterly
	Years 4 and 5 - Twice per Year
	Years 6 through 10 - Twice per Year
Botanical Monitoring	Annually Beginning in Spring or Summer Following Installation (May-August)
Faunal Diversity Monitoring	Annually
Groundwater and Hydrologic Monitoring	Twice per Year
CRAM Assessments	Every 2 years
Focused Species Surveys	Annually
Photodocumentation	Annually

7.1.1 Horticultural Monitoring

Horticultural (qualitative) monitoring will be conducted at each onsite mitigation area by a RE. Data collected during horticultural monitoring events will include, but not be limited to, soil conditions (e.g., moisture), seed germination, presence of volunteer native species, nonnative plant species, significant disease or pest problems, vandalism, and any erosion issues. All observations and any data collected will

be documented on a horticultural monitoring form. A RE will conduct horticultural monitoring at each mitigation area monthly during the initial 120-day PEP and the remainder of Year 1 following implementation, quarterly during Years 2 and 3, semi-annually (i.e., twice per year) during Years 4 and 5, and semi-annually in Years 6 through 10 for the upland communities or until the performance standards are met. Data collected during the horticultural monitoring events will be summarized into a memo and provided to the LACFCD. Each memo will also include any recommendations to increase the success of the mitigation area.

7.1.2 Botanical Monitoring

Botanical (quantitative) monitoring will also be conducted at each onsite mitigation area by a RE. Botanical monitoring events will provide quantifiable data to assist with determining progress towards established performance standards. Monitoring will be conducted once per year, between May and August, with a goal of monitoring at the same time each year. The first botanical monitoring event will be conducted in the spring or summer following container plant and/or pole stake installation. Scrub habitat reaches peak growth sometime between April and June and riparian habitat reaches its peak growth sometime between June and August. Data collected during botanical monitoring events will include container plant survival, total native and nonnative plant cover, structural diversity (tree, shrub and herb strata), tree and shrub height, and native plant species richness.

Survival will be determined by counting installed plantings and will be conducted annually until Year 5. Any plantings that appear to be dead, missing, or in a condition unlikely to survive, will be marked with brightly colored biodegradable flagging. Results of survival counts will be noted on botanical monitoring forms. If a volunteer or recruit of the same species originally planted is determined to be growing within a plant basin (or within one meter of that basin) with a dead plant, then that plant will count toward the survival total.

Native and nonnative plant cover will be determined using a modified point-line intercept method along established transect lines (Elzinga et al. 2001). Transect lines will be established randomly during the 120-day PEP. The start and end of each transect line will be marked with steel rebar and a plastic orange cap and GPS coordinates will be taken to document the start and end locations of each transect. Transects will have a maximum length of 100-meters and be will established at one 100-meter transect per acre. If a mitigation area is between 0.5 acre and 1.0 acre, then the maximum transect length will be 25 meters and there will be no more than three transects established. If a mitigation area is less than 0.5 acre (e.g., DG-5) then the maximum transect length will be 25 meters and there will be no more than two transects established. Mitigation areas with an area of greater than three acres, such as DG-4, will have a maximum of five 100-meter transects established.

Data will be collected along each transect at every 0.5 m (sampling location), starting at 0.5 m. Each plant species that intersects the transect tape at each sampling location will be recorded. A sampling dowel will be used to assist in determining which plant species intersect the transect tape at each sampling location. If the canopy of a plant intersects the transect tape at a sampling location, that species will also be recorded; this includes tree species with an overhead canopy. If only one plant species intersects the transect tape at any sampling location, that species will receive one tally mark. If multiple plant species

intersect the transect tape at any sampling location, they will receive a fraction of a tally mark dependent on the number of species that intersect the transect tape at that sampling location. Bare ground, rock, and litter will also be recorded along each transect in areas that have no plant overlap. Species occurrence along each transect line will be totaled and divided by the number of sampling points and multiplied by 100 to derive the percent cover (total cover) along that transect. If bare ground, rock, and litter are recorded, these values will be deducted from the total number of plant-transect intersections (a.k.a., hits). The same transects will be monitored during Year 1 through Year 5 for the riparian mitigation areas and Year 1 through 10 for the upland mitigation areas or until the performance standards are met. Photos will also be taken from the start and end of each transect whenever data is collected. Botanical monitoring will occur concurrently at established reference sites to obtain accurate data in which to measure annual performance standard targets. All collected data will be entered in the field onto datasheets. Data will be collected along transect lines at the reference sites in the same manner as it was collected along the transect lines in the mitigation areas.

In addition, the Relevé vegetation sampling protocol developed by the California Native Plant Society and CDFW will be used to supplement quantitative data collection. Specifically, the CDFW-CNPS Protocol for the Combined Vegetation Rapid Assessment and Relevé Field Form will be used (CDFW-CNPS 2016). In shrub dominated habitat a 400 square meter plot will be used and in tree dominated habitat a 1,000 square meter plot will be used. A total of one plot per every three acres will be established for habitats covering large areas (such as DG-4). If a habitat type covers less than three acres, then one plot per acre will be used.

7.1.3 Wildlife Use Monitoring

Faunal Diversity Monitoring

To monitor and document the use of the onsite mitigation areas by native wildlife species, seasonal wildlife surveys will be conducted by a qualified biologist each year in the spring and fall during the five-year maintenance and monitoring period. These surveys will be optimally timed during the height of spring and fall migration periods to document the highest and most diverse number of species using the areas. The surveys will be conducted on foot throughout each of the mitigation areas. The qualified biologist conducting the monitoring will document all species observed, detected, and/or heard during the surveys and a master wildlife compendium will be maintained to document the wildlife identified using the mitigation areas. Binoculars and appropriate field guides will be utilized during the surveys to aid in accurate wildlife species identification. A handheld GPS device will be used to take the coordinates of any special status species observed during the surveys. To the extent possible, spring faunal diversity monitoring will be conducted at the same time as the focused species surveys and fall faunal diversity monitoring will be conducted at the same time as the fall horticultural monitoring event.

Focused Species Surveys

Protocol-level surveys for least Bell's vireo will be conducted by a qualified biologist in the riparian mitigation areas and the existing riparian habitat within the Project area on an annual basis during the five-year maintenance and monitoring period. Protocol-level surveys may also be conducted annually during the five-year maintenance and monitoring period for other federally-listed species that are known

to occur or have the potential to occur within the Project area. These additional species may include southwestern willow flycatcher, western yellow-billed cuckoo, and coastal California gnatcatcher. Focused protocol surveys will be conducted in accordance with the most up-to-date and widely-accepted survey protocols established for each of the target species. Binoculars and appropriate field guides will be utilized during the surveys to aid in accurate wildlife species identification. A handheld GPS device will be used to take the coordinates of any target or incidental special status species observed during the surveys. To the extent possible, focused protocol surveys will be conducted at the same time as the spring faunal diversity monitoring.

7.1.4 Groundwater and Hydrologic Monitoring

Planned habitat mitigation for the Project includes restoring riparian vegetation communities that are typically reliant on the presence of soil moisture levels that are greater than typical soil moisture levels in upland vegetation communities, and the presence of groundwater. Current groundwater availability for mitigation areas varies and could be affected following sediment removal activities. The planned mitigation for the Project in the riparian vegetation communities will be supplemented with water from a perched aquifer that is located on the west side of the sediment removal area and from a constant supply of urban runoff on the east side of the sediment removal area.

Groundwater monitoring wells have been established and are regularly monitored at locations north (Jet Propulsion Laboratory monitoring wells) and east (City monitoring wells) of Devil's Gate Reservoir. LACFCD will acquire the groundwater level data from both JPL and the City each year during the wet and dry seasons for each year that mitigation monitoring occurs. This data will be provided to the RE along with historic groundwater data for inclusion in the annual report. The RE will provide a discussion of the groundwater levels in the annual report and will identify if any unusual fluctuations have occurred and if any adaptive management measures need to be implemented (see Section 8.0 for specific adaptive management measures).

LACFCD currently monitors the flow of water entering Devil's Gate Reservoir, the elevation levels where water is held behind the dam, and the duration of inundation at various elevation levels. This data will continue to be monitored by LACFCD on an annual basis and will be reported in the annual reports. In the annual report, the RE will provide a discussion of the success of the mitigation areas as it relates to the hydrology information.

Focused hydrologic monitoring will be conducted at mitigation areas DG-W-1 and DG-W-2, where wetland conditions may develop if regular inputs of storm water runoff occur in these areas. Focused hydrologic monitoring will be conducted by ECORP's RE during qualitative monitoring events and will include noting changes in hydrology, presence of surface water, and the presence of hydrophytic vegetation. If it is determined that wetland conditions may be present based on the monitoring results, a qualified biologist will perform an informal wetland delineation to verify wetland conditions, following the guidelines of the USACE Arid West Supplement. A formal wetland determination may be conducted if it is determined to be warranted.

7.1.5 California Rapid Assessment Method (CRAM) Monitoring

CRAM is a scientifically defensible, rapid assessment method designed to assess ambient conditions of wetland habitats within California. It is also a common tool used, in conjunction with other monitoring methodologies, to assess the performance of compensatory mitigation and restoration projects in riparian habitats. CRAM assesses ecological attributes such as site hydrology, physical structure, and biotic structure and provides a score in reference to similar unimpaired habitat types within California.

Following the implementation of onsite mitigation activities, a certified CRAM practitioner will conduct assessments every two years at the previously established CRAM AAs in riparian mitigation areas DG-4, DG-5, DG-9 (Temp Impacts) and in the permanent impact area. If necessary, additional CRAM AAs may be established in appropriate locations in the mitigation areas. CRAM assessments will be conducted during the same timeframe each year that assessments are conducted. CRAM scores obtained during these monitoring events will be compared to baseline CRAM scores taken in 2015 and used to track habitat re-establishment and function. Individual CRAM metrics such as Structural Patch Richness can also be used separately from the overall score to track the progress of specific site ecological functions. The Structural Patch Richness metric measures the number of different patch types within a given AA and can provide insight into how the AA is functioning. The Plant Community metric measures the number of plant layers, number of co-dominant species and percent invasion. This metric can identify the types of plants growing as well as invasive species outbreaks within a given AA. CRAM monitoring will continue during the long-term management phase of the Project.

7.1.6 Photodocumentation

Permanent photo point stations will be established at each onsite mitigation area to provide a visual record of progress over time at each site. The geographic coordinates of each photo station will be recorded with a GPS unit and the directionality of each photo station will be documented. Digital photos will be taken from these points during each botanical monitoring event throughout the monitoring period. Additional photos will be taken throughout each site that are representative of current site conditions or show issues that need to be addressed. Photos will be provided as an appendix to each annual report. The location and exact number of photo points will be determined during the PEP.

7.2 Reporting Requirements

7.2.1 Completion of Initial Construction and As-Built Report

An email notification will be submitted to the Agencies following the completion of each phase of compensatory mitigation implementation. It is anticipated that at least three phases will be necessary due to logistical reasons. As-Built Reports will be prepared for the three phases of implementation and will be provided to the agencies following the notification that each phase has been completed. The following information will be included in the As-Built Reports:

- Date(s) all compensatory mitigation construction activities were completed;
- Modifications (if any) to the originally-approved schedule for future mitigation monitoring, implementation and reporting pursuant to final approved mitigation plan;

- Summary of compliance status with each special condition of associated permits or verification (including any noncompliance previously having occurred or currently occurring and corrective actions taken to achieve compliance);
- Photographs of the habitats constructed at the compensatory mitigation site. For those aspects directly associated with pre-existing WOUS, before photos shall also be provided;
- One copy of "as built" drawings for the entire compensatory mitigation Project prepared in accordance with SPD Map and Drawing Standards. These will be updated with each phase that is completed.

7.2.2 Annual Reporting

Annual reports for the onsite compensatory mitigation areas will be prepared for each of the monitoring years following the PEP or until the regulatory agencies (USACE, USFWS, CDFW, and RWQCB) deem the mitigation site successful. At a minimum, annual reports will include the following information and all information as required within Project permits:

- Description of restoration activities (e.g. site preparation, plant installation and overview of planting effort, number of replaced plants and/or recruits, when activities were conducted);
- Description of maintenance activities (e.g. nonnative plant control, irrigation, trash removal);
- Current site conditions (e.g. percent survival, percent cover, hydrology, methods used to assess parameters);
- Current status and progress of the site with regard to meeting all of the mitigation success criteria;
- Results of the PEP and horticultural monitoring
- Results of the botanical monitoring
- Any problems or issues noted during the monitoring and steps taken to address them;
- Wildlife species compendium;
- Special-status species documentation, if any;
- Documentation of large scale issues and corrective actions, if applicable;
- Coordination with agencies; and
- Photo documentation.

7.2.3 Mitigation Completion

Upon achieving the onsite mitigation success criteria, the RE will prepare a notification memorandum for the LACFCD and regulatory agencies. The letter will provide information that verifies the successful completion of the 5-year mitigation effort for the riparian mitigation areas and the 10-year mitigation

effort for the upland mitigation areas and request concurrence from the LACFCD and regulatory agencies. Because each of the mitigation areas will be monitored, managed, and discussed separately, individual mitigation areas can meet the success criteria and receive final sign-off independently of each other. In order to be released from further mitigation and monitoring responsibilities for each mitigation area, LACFCD must receive written confirmation from the regulatory agencies that the required onsite mitigation has met all the success criteria and that the mitigation is deemed as complete for that mitigation area.

If a mitigation area meets all of the success criteria prior to Year 5 for the riparian areas or prior to Year 10 for the upland areas, (in comparison with reference site), then LACFCD may request early sign-off.

7.2.4 Fund Designation Agreement

Following the completion of the milestones identified in Table 22, LACFCD will provide a memorandum to CDFW with the information on the completion of each of the milestones. Appendix B includes the full Fund Designation Agreement between LACFCD and CDFW.

Table 22. Fund Designation and Credit Mitigation Milestones				
ITEM*	Site Preparation and Implementation (50%)	Achievement of 3-Year Performance Standard (70%)	Achievement of 5-Year Performance Standard (90%)	Signoff (100%)
East Side Mitigation	\$750,000.00	\$250,00.00	\$120,000.00	\$150,000.00
Johnson Field Restoration	\$150,000.00	\$40,000.00	\$25,000.00	\$6,500.00
Lower Altadena Restoration	\$500,000.00	\$100,000.00	\$50,000.00	\$100,000.00
West Side Mitigation	\$1,900,000.00	\$780,000.00	\$450,000.00	\$350,000.00
Former Mining Pit Restoration	\$255,000.00	\$55,000.00	\$25,000.00	\$8,500.00
Temporary Impact Areas	\$850,000.00	\$315,000.00	\$125,000.00	\$245,000.00
Off-Site Mitigation Acquisition				\$6,400,000.00
TOTAL CREDIT				\$14,000,000.00

*Full description of each mitigation item is detailed in the Habitat Restoration Plan.

8.0 ADAPTIVE MANAGEMENT PLAN

Adaptive management is a method used to address unexpected changes in site conditions, responsibilities, or performance of a mitigation site. The goal of adaptive management is to actively adjust the approach or methods so that the onsite compensatory mitigation Project achieves its objectives and ecological performance standards. Problems that might prompt the need for adaptive management include a failure of the mitigation site to attain interim and/or final performance standards, fire, storm events with unusually high levels of runoff, substantial new exotic plant or wildlife infestations, and human-related disturbances such as extreme trespassing or vandalism.

The RE will analyze site progress as part of the regularly scheduled monitoring at the mitigation areas and will suggest remedial measures to address unforeseen changes in site conditions or other components of the mitigation Project. Minor problems, such as trash, vandalism, isolated instances of plant mortality, or

small-scale weed or pest infestations will be addressed and resolved when they are discovered. Specific monitoring will be conducted after unusual events, such as a large storm event or fire, to document damage to the mitigation areas. If changes in the management of the mitigation areas are necessary due to the unforeseen circumstances or damage, then the RE will develop an approach to address and rectify the problems. Resolution of minor problems will be documented in the annual reporting and will not require separate notification to any agencies.

If unforeseen changes noted during monitoring will result in a substantial change to the management of the mitigation areas, LACFCD will be notified immediately and an adaptive approach can be developed in a timely manner to address such changes. In the event that large scale issues arise, the CDFW and USACE will be notified within 24 hours of discovery. Large scale corrective measures, such as regrading part or all of the compensatory mitigation areas, replanting more than 20 percent of the areas to improve species cover or diversity, or supplemental soil amendments may require approval by the CDFW and USACE. Large scale events and the proposed corrective measures will be thoroughly documented in a report, which will be provided to CDFW and USACE for review and approval. LACFCD is ultimately responsible for the success of the implementation and will take corrective action if any component is not achieving the performance standards.

CDFW will be notified if performance standards are not met at any of the mitigation areas in a monitoring year. If modifications are necessary to the CDFW-approved HRP, the USACE-approved HMMP, or the USACE-approved LTMP to improve success at the mitigation areas, then the modifications may need to be approved by CDFW and or USACE prior to implementation.

8.1 Potential Risks and Uncertainties

8.1.1 Flooding

The proposed onsite mitigation areas are located within a flood control facility that has experienced high stormwater flows in the past. As such, there is the potential risk of flooding that may result in large-scale damage to container plantings, loss of irrigation systems, site erosion, and channel instability. The specific triggers that will be used to make decisions regarding inundation impacts to plants species in the mitigation areas will include number of days of inundation, depth of the inundation, and visible signs of damage observed during monitoring. The maximum number of days of inundation will be limited to 30 days because black willow can survive extended periods of inundation. However, mulefat and some of the other species cannot withstand the same duration of inundation as black willow. In addition, the depth of inundation will have a bearing on the number of days of allowable inundation. Plants inundated at a one-foot depth can survive longer than if they were inundated at a three-foot depth, for example. Therefore, if inundation does occur, LACFCD will coordinate with the RE to determine the approximate depth of inundation and will record the date the inundation began. The RE will determine a maximum number of days of allowable inundation based on the depth and will notify LACFCD to determine the date when the inundation must be alleviated. For the first two years of the restoration project, the RE will notify CDFW within 24 hours of making the determination of the appropriate course of action. CDFW may subsequently reconsider this notification requirement after the first two years of the restoration project.

If large scale events occur that require corrective actions, then the CDFW, USFWS, and USACE will be notified within 24 hours of discovery. The proposed corrective measures will be thoroughly documented in a report that will be provided to CDFW, USFWS, and USACE for review and approval.

Corrective Measures

In the event site damage does occur, LACFCD and regulatory agencies will be notified within 24 hours (via email and potentially by phone) and prior to the implementation of any corrective measures. Such measures may include, but are not limited to:

- Re-grading/contouring part or all of the damaged mitigation site;
- Installation of additional container plantings or native seed;
- Repair or replacement of damaged irrigation systems; or,
- Installation of additional erosion BMPs.

8.1.2 Fire

Although uncommon for riparian habitats, there is the potential risk of damage to the onsite mitigation areas from wildfire. Impacts from wildfire may include loss of container plantings and existing native vegetation, damage to irrigation systems or exclusionary barriers, potential for nonnative plant infestations, and/or potential for large-scale erosion from subsequent stormflows.

Corrective Measures

In the event a wildfire does occur within any of the proposed mitigation areas, LACFCD and regulatory agencies will be notified within 24 hours (via email and potentially by phone) and prior to the implementation of any corrective measures. Such measures may include, but are not limited to:

- Installation of additional container plantings or native seed;
- Repair or replacement of damaged irrigation systems or exclusionary barriers;
- Additional nonnative plant control measures; or,
- Installation of additional erosion BMPs.

8.1.3 Site Failures

Given the unpredictable nature of restoration projects, there is always the potential for site failure in the form of large-scale die-off of container plants due to drought or insufficient site hydrology to support target communities, unmanageable infestations of nonnative species, or other unforeseen issues. Monitoring the health of the target communities, groundwater levels, and natural precipitation will trigger the need for corrective measures. Triggers will include: annual plant mortalities that are not offset by natural recruitment or volunteers of the same plant species; a negative trend in native tree species cover for a three-year period; and, slow growth of tree species (e.g., less than 2.5 feet of vertical growth per year, on average, until the trees achieve the typical maximum size for each particular species.

Corrective Measures

In the event of significant site failures, LACFCD and regulatory agencies will be notified within 24 hours (via email and potentially by phone) and prior to the implementation of any corrective measures. Such measures may include, but are not limited to:

- Apply supplemental irrigation if extended periods of drought occur or if natural rainfall is less than what would be required to sustain the target communities;
- Re-grading/contouring part or all of the affected mitigation area;
- Adding supplemental soil amendments;
- Installation of additional container plantings or native seed;
- Changes in water regime behind the dam if water availability is low or inundation is prolonged;
- Trail closures or installation of additional barriers if human-caused impacts are damaging the mitigation areas; or
- Siting of new mitigation area as additional compensation.

9.0 REFERENCES

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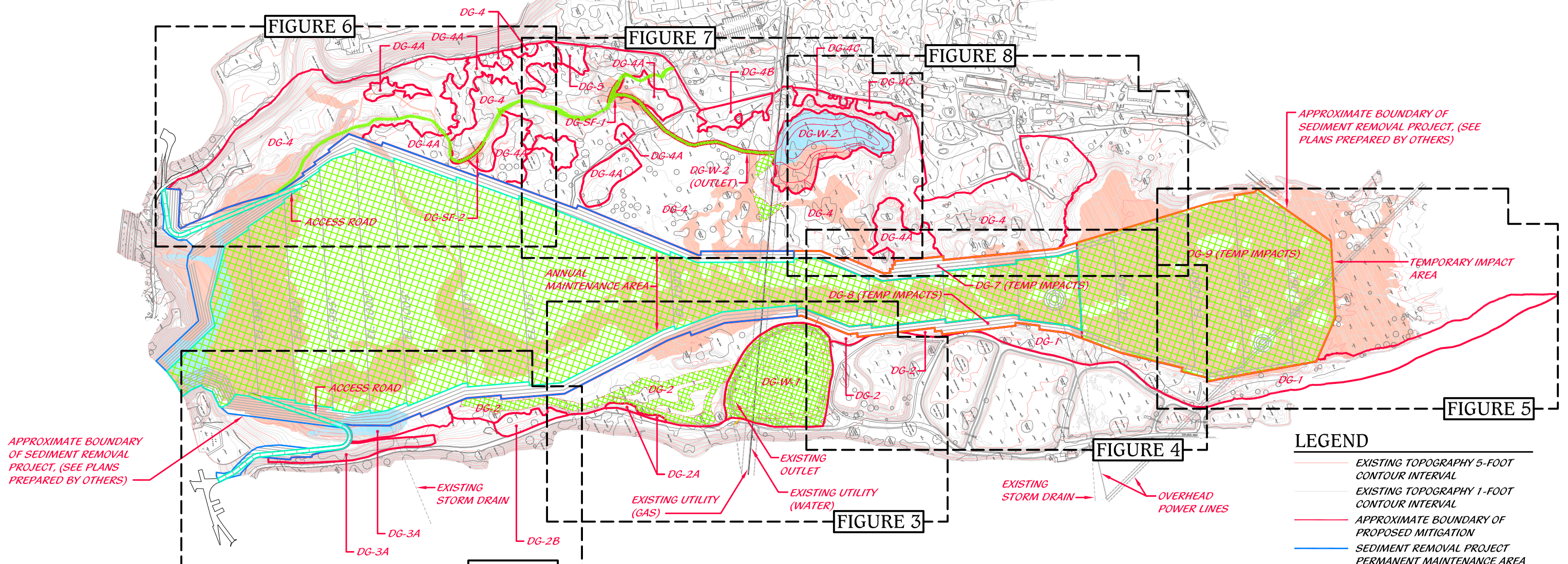
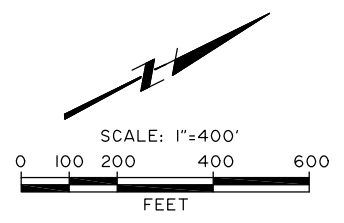
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LIST OF APPENDICES

Appendix A – Conceptual Restoration Design Drawings

Appendix B – Fund Designation Agreement

Conceptual Restoration Design Drawings



APPROXIMATE BOUNDARY OF SEDIMENT REMOVAL PROJECT, (SEE PLANS PREPARED BY OTHERS)

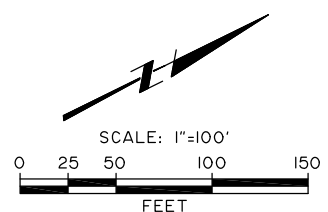
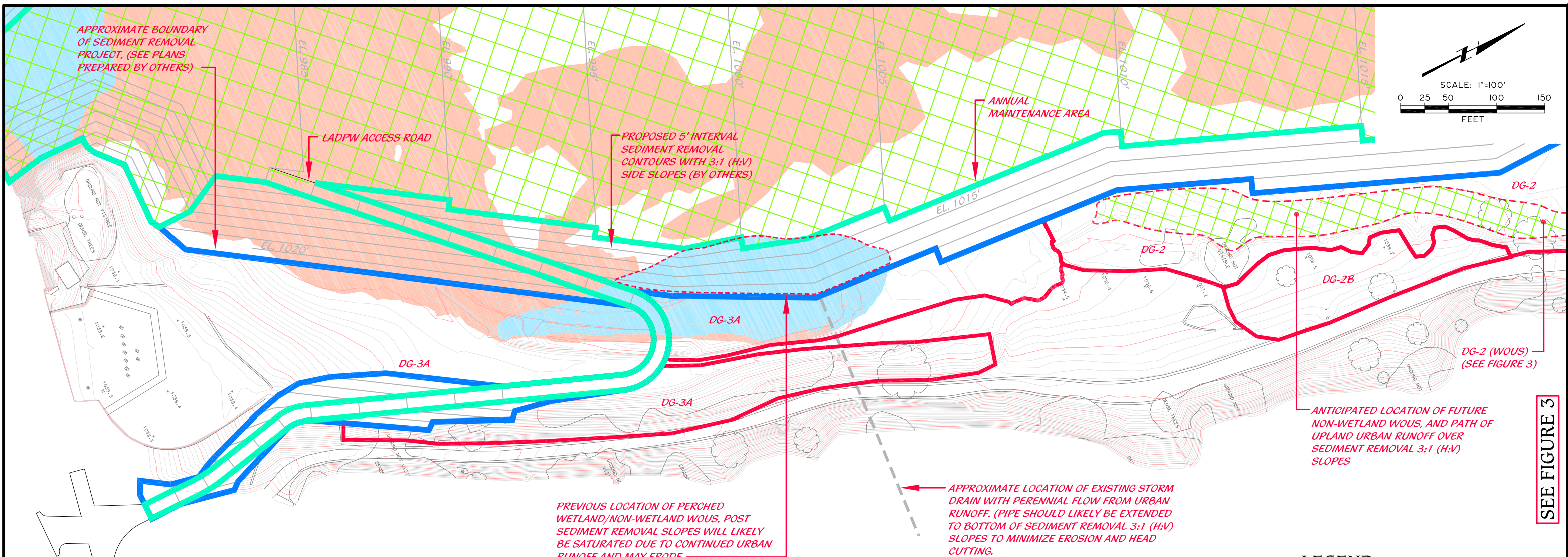
APPROXIMATE BOUNDARY OF SEDIMENT REMOVAL PROJECT, (SEE PLANS PREPARED BY OTHERS)

TEMPORARY IMPACT AREA

- LEGEND**
- EXISTING TOPOGRAPHY 5-FOOT CONTOUR INTERVAL
 - EXISTING TOPOGRAPHY 1-FOOT CONTOUR INTERVAL
 - APPROXIMATE BOUNDARY OF PROPOSED MITIGATION
 - SEDIMENT REMOVAL PROJECT PERMANENT MAINTENANCE AREA
 - SEDIMENT REMOVAL PROJECT ANNUAL MAINTENANCE AREA
 - SEDIMENT REMOVAL PROJECT TEMPORARY IMPACTS
 - SEDIMENT REMOVAL PROJECT 5-FOOT CONTOUR
 - PRE PROJECT NON-WETLAND WOUS
 - APPROXIMATE ADDITIONAL LIMIT OF POST PROJECT NON-WETLAND WOUS
 - WETLAND WATERS OF THE U.S.

POST SEDIMENT REMOVAL SITE PLAN
SCALE: 1"=400'

	TERRACOSTA CONSULTING GROUP ENGINEERS AND GEOLOGISTS 3890 MURPHY CANYON ROAD, SUITE 200 SAN DIEGO, CA 92123 (858) 573-6900	FIGURE NUMBER 1
	PROJECT NAME DEVIL'S GATE RESERVOIR	PROPOSAL NUMBER 3019
OVERALL POST SEDIMENT REMOVAL SITE PLAN - INDEX		



SEE FIGURE 3

PREVIOUS LOCATION OF PERCHED WETLAND/NON-WETLAND WOUS. POST SEDIMENT REMOVAL SLOPES WILL LIKELY BE SATURATED DUE TO CONTINUED URBAN RUNOFF AND MAY ERODE

APPROXIMATE LOCATION OF EXISTING STORM DRAIN WITH PERENNIAL FLOW FROM URBAN RUNOFF. (PIPE SHOULD LIKELY BE EXTENDED TO BOTTOM OF SEDIMENT REMOVAL 3:1 (H:V) SLOPES TO MINIMIZE EROSION AND HEAD CUTTING.

DETAILED SITE PLAN
SCALE: 1"=100'

DG-3A

DG-3A is a 1.15-acre area in the southeastern portion of the Reservoir. Currently, the area consists of disturbed riparian/oak woodland dominated by large eucalyptus trees with an understory of exotics including mustards and nonnative grasses.

Planned Activities:

1. Planting and seeding with native riparian (and oak) species.
2. Remove non-native/invasive plant species from approximately 1.0 acre within the mitigation area.

DG-2

DG-2 is a 3.83-acre area in the eastern portion of the Reservoir located between the Reservoir channel and the pedestrian pathway. Currently, the area consists of a mix of riparian woodland, mulefat thickets, and riparian herbaceous vegetation communities with several areas dominated by exotics including perennial pepperweed, poison hemlock, mustards, wild radish, and Italian thistle.

Planned Activities:

1. Planting and seeding with native riparian species.
2. Remove non-native/invasive plant species from approximately 1.1 acres within the mitigation area.

DG-2B

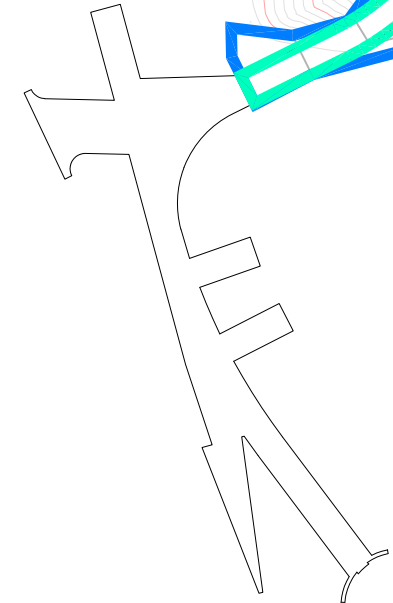
DG-2B is a 0.38-acre area on the easternmost side of the Reservoir also adjacent to the pedestrian pathway. The area is a disturbed area that gently slopes away from the pathway and it supports a Mustard and Annual Brome Semi-Natural Herbaceous Stand community dominated by poison hemlock, perennial pepperweed, nonnative grasses, mustards, wild radish, and Italian thistle. Adjacent vegetation communities include pockets of riparian woodland interspersed in mulefat thickets on the west side and north sides and oak woodland on the east side of the pathway.

Planned Activities:

1. Planting and seeding with native species.
2. Remove non-native/invasive plant species from approximately 0.38 acres within the mitigation area.

LEGEND

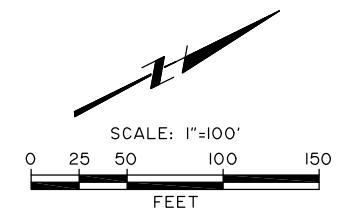
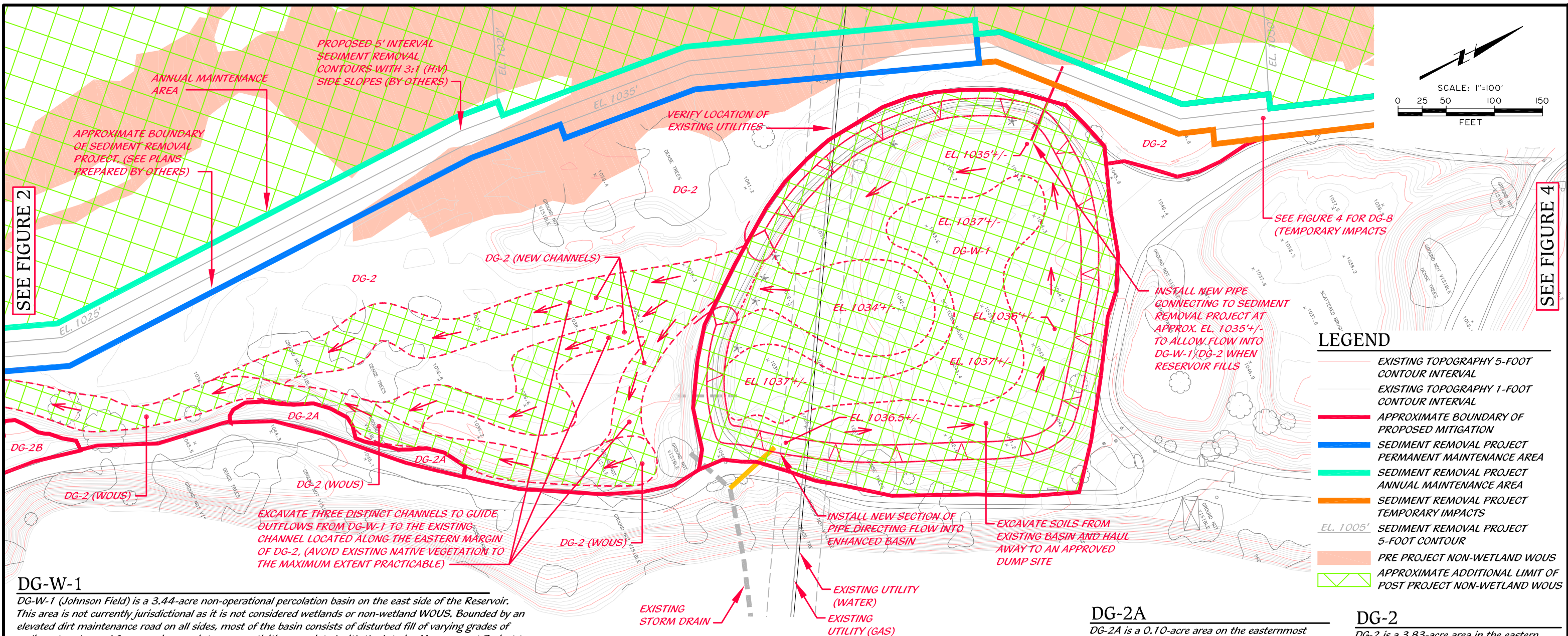
- EXISTING TOPOGRAPHY 5-FOOT CONTOUR INTERVAL
- EXISTING TOPOGRAPHY 1-FOOT CONTOUR INTERVAL
- APPROXIMATE BOUNDARY OF PROPOSED MITIGATION
- SEDIMENT REMOVAL PROJECT PERMANENT MAINTENANCE AREA
- SEDIMENT REMOVAL PROJECT ANNUAL MAINTENANCE AREA
- SEDIMENT REMOVAL PROJECT TEMPORARY IMPACTS
- EL. 1005' SEDIMENT REMOVAL PROJECT 5-FOOT CONTOUR
- PRE PROJECT NON-WETLAND WOUS
- APPROXIMATE ADDITIONAL LIMIT OF POST PROJECT NON-WETLAND WOUS
- WETLAND WATERS OF THE U.S.



TERRACOSTA CONSULTING GROUP ENGINEERS AND GEOLOGISTS 3890 MURPHY CANYON ROAD, SUITE 200 SAN DIEGO, CA 92123 (858) 573-6900		FIGURE NUMBER 2
PROJECT NAME DEVIL'S GATE RESERVOIR		PROPOSAL NUMBER 3019



**POST SEDIMENT REMOVAL
DETAILED SITE PLAN**



SEE FIGURE 2

SEE FIGURE 4

- LEGEND**
- EXISTING TOPOGRAPHY 5-FOOT CONTOUR INTERVAL
 - EXISTING TOPOGRAPHY 1-FOOT CONTOUR INTERVAL
 - APPROXIMATE BOUNDARY OF PROPOSED MITIGATION
 - SEDIMENT REMOVAL PROJECT PERMANENT MAINTENANCE AREA
 - SEDIMENT REMOVAL PROJECT ANNUAL MAINTENANCE AREA
 - SEDIMENT REMOVAL PROJECT TEMPORARY IMPACTS
 - EL. 1005' SEDIMENT REMOVAL PROJECT 5-FOOT CONTOUR
 - PRE PROJECT NON-WETLAND WOUS
 - APPROXIMATE ADDITIONAL LIMIT OF POST PROJECT NON-WETLAND WOUS

DG-W-1
 DG-W-1 (Johnson Field) is a 3.44-acre non-operational percolation basin on the east side of the Reservoir. This area is not currently jurisdictional as it is not considered wetlands or non-wetland WOUS. Bounded by an elevated dirt maintenance road on all sides, most of the basin consists of disturbed fill of varying grades of sediment and gravel from previous maintenance activities associated with the Interim Management Project to manage sediment behind Devil's Gate Dam. The disturbed portion of the area primarily consists of a Mustard and Annual Brome Semi-Natural Herbaceous Stand community dominated by nonnative annuals including mustards, nonnative grasses, tocalote, wild radish, Italian thistle, and some perennial pepperweed. Several escaped cultivars border the basin on the east and west sides including palms and large eucalyptus trees.

- Planned Activities:**
1. Planting and seeding with native riparian species.
 2. Recontour existing soil to improve conveyance of flows during inclement weather.
 3. Recontour existing soil to improve distribution of water throughout mitigation area.
 4. Recontour and homogenize soil to improve soil conditions to support riparian trees.
 5. Improve hydrology so that DG-W-1 can convey flows to DG-2 and DG-2 non-wetland WOUS.
 6. Remove non-native/invasive plant species from approximately 1.0 acre within the mitigation area.
 7. Export of soil will occur with a total estimated volume of 34,287 cu yd.

Additional Notes:
 Select areas will be graded to be lower in elevation than the locations slated for re-establishment of riparian woodland/mulefat thickets in order to allow water to collect to support hydrophytic vegetation development. Although wetland mitigation is not a goal for DG-W-1, if wetland habitat can be supported then the habitat restoration program will maintain these areas appropriately. The existing maintenance road on the west and south sides of DG-W-1 will be partially excavated to have a sloped berm without a flattened top, and a minimum 15-foot-wide channel will be cut through the southwestern corner so water can flow into DG-2, and ultimately into the main basin. The existing street drain that outflows just south of DG-W-1 directly into DG-2 will be modified to flow directly into DG-W-1. Also, approximately 2-foot diameter corrugated HDPE pipe will be installed at the northwestern corner of DG-W-1 at approximately elevation 1035' to allow backup flows into the basin. It is anticipated that this may occur for a 4 to 8 hour period during 2-year storm events. Final resulting acreage will be determined following the habitat mitigation implementation.

DETAILED SITE PLAN
 SCALE: 1"=100'

DG-2 (NEW CHANNELS)
 DG-2 (NEW CHANNELS) is a 0.83-acre area within DG-2. The plan is to excavate three distinct channels to guide outflows from the modified DG-W-1 basin, and reconnect flows to the existing DG-2 (WOUS) drainage.

- Planned Activities:**
1. Planting and seeding with native riparian species.
 2. Recontour existing soil to improve conveyance of flows during inclement weather.
 3. Recontour existing soil to improve distribution of water throughout mitigation area.
 4. Recontour and homogenize soil to improve soil conditions to support riparian trees.
 5. Improve hydrology so that DG-W-1 can convey flows to DG-2.
 6. Remove non-native/invasive plant species from approximately 0.5 acre within the mitigation area.
 7. Estimated volume of soil to be manipulated throughout mitigation area is 540.0 cu yd. Neither import or export of soil is anticipated.

DG-2 (WOUS)
 DG-2 (WOUS) is a 0.75-acre drainage area in the eastern portion of the Reservoir located westerly of DG-2A and the pedestrian pathway. The plan is to rehabilitate the area.

- Planned Activities:**
1. Planting and seeding with native riparian species.
 2. Recontour existing soil in select locations to improve conveyance of flows during inclement weather.
 3. Improve hydrology so that DG-W-1 can convey flows to the Reservoir.
 4. Remove non-native/invasive plant species from approximately 0.3 acre within the mitigation area.
 5. Neither import or export of soil is anticipated.

DG-2A
 DG-2A is a 0.10-acre area on the easternmost side of the Reservoir immediately adjacent to the pedestrian pathway. The area is on an elevated terrace nearly level with the adjacent pathway and primarily consists of a Mustard and Annual Brome Semi-Natural Herbaceous Stand community dominated by nonnative grasses, mustards, and horehound. Adjacent vegetation communities include pockets of riparian woodland interspersed in mulefat thickets on the west side, disturbed oak woodland bisecting the area, and coast live oak woodland on the east side of the pathway.

- Planned Activities:**
1. Planting and seeding with native species.
 2. Remove non-native/invasive plant species from approximately 0.1 acre within the mitigation area.

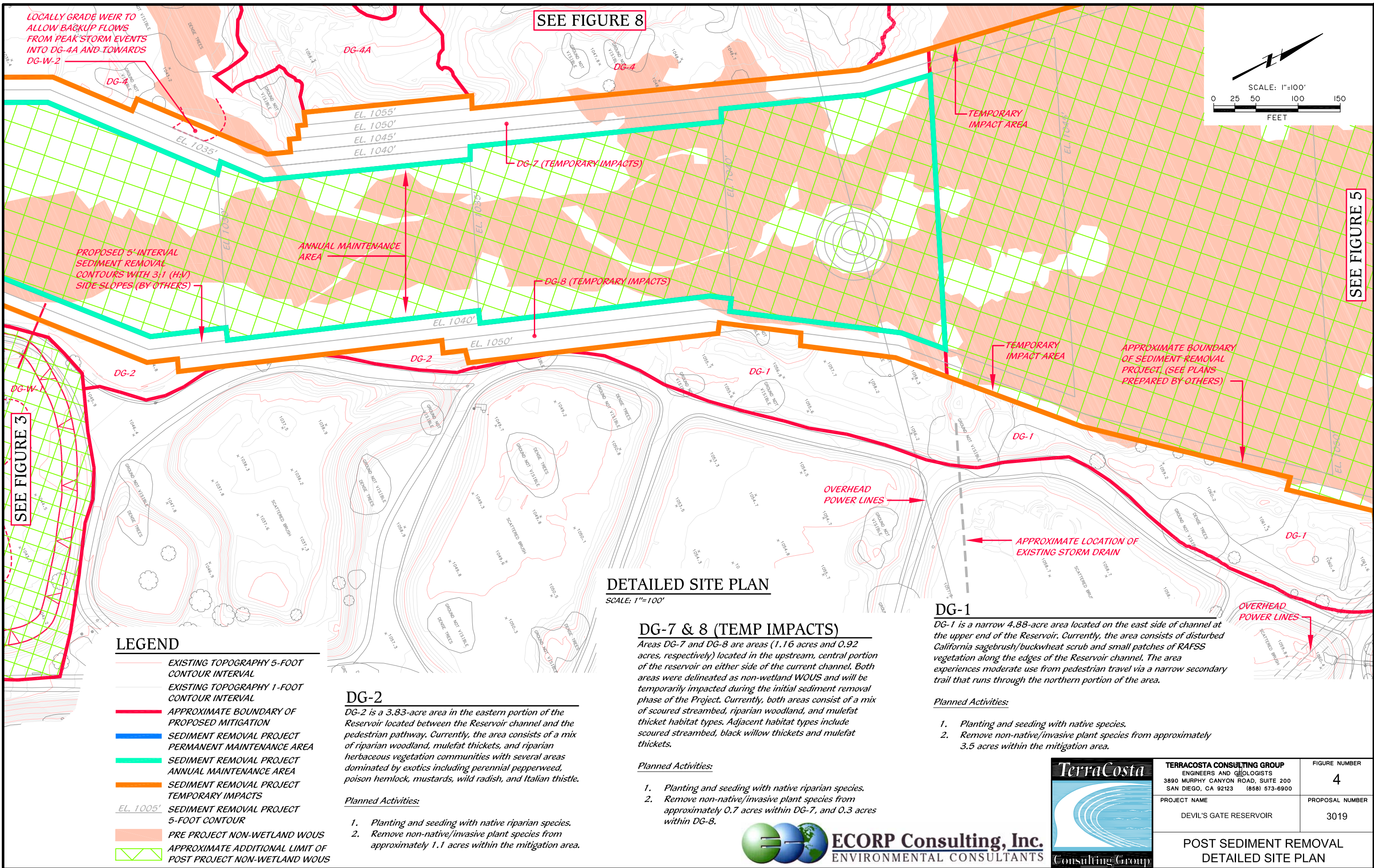
DG-2
 DG-2 is a 3.83-acre area in the eastern portion of the Reservoir located between the Reservoir channel and the pedestrian pathway. Currently, the area consists of a mix of riparian woodland, mulefat thickets, and riparian herbaceous vegetation communities with several areas dominated by exotics including perennial pepperweed, poison hemlock, mustards, wild radish, and Italian thistle.

- Planned Activities:**
1. Planting and seeding with native riparian species.
 2. Remove non-native/invasive plant species from approximately 1.1 acres within the mitigation area.

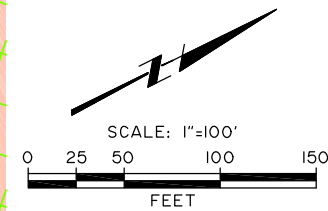


TERRACOSTA CONSULTING GROUP ENGINEERS AND GEOLOGISTS 3890 MURPHY CANYON ROAD, SUITE 200 SAN DIEGO, CA 92123 (858) 673-6900	FIGURE NUMBER 3
PROJECT NAME DEVIL'S GATE RESERVOIR	PROPOSAL NUMBER 3019

**POST SEDIMENT REMOVAL
 DETAILED SITE PLAN**



SEE FIGURE 8



SEE FIGURE 5

SEE FIGURE 3

DETAILED SITE PLAN

SCALE: 1"=100'

LEGEND

- EXISTING TOPOGRAPHY 5-FOOT CONTOUR INTERVAL
- EXISTING TOPOGRAPHY 1-FOOT CONTOUR INTERVAL
- APPROXIMATE BOUNDARY OF PROPOSED MITIGATION
- SEDIMENT REMOVAL PROJECT PERMANENT MAINTENANCE AREA
- SEDIMENT REMOVAL PROJECT ANNUAL MAINTENANCE AREA
- SEDIMENT REMOVAL PROJECT TEMPORARY IMPACTS
- EL. 1005' SEDIMENT REMOVAL PROJECT 5-FOOT CONTOUR
- PRE PROJECT NON-WETLAND WOUS
- APPROXIMATE ADDITIONAL LIMIT OF POST PROJECT NON-WETLAND WOUS

DG-2

DG-2 is a 3.83-acre area in the eastern portion of the Reservoir located between the Reservoir channel and the pedestrian pathway. Currently, the area consists of a mix of riparian woodland, mulefat thickets, and riparian herbaceous vegetation communities with several areas dominated by exotics including perennial pepperweed, poison hemlock, mustards, wild radish, and Italian thistle.

Planned Activities:

1. Planting and seeding with native riparian species.
2. Remove non-native/invasive plant species from approximately 1.1 acres within the mitigation area.

DG-7 & 8 (TEMP IMPACTS)

Areas DG-7 and DG-8 are areas (1.16 acres and 0.92 acres, respectively) located in the upstream, central portion of the reservoir on either side of the current channel. Both areas were delineated as non-wetland WOUS and will be temporarily impacted during the initial sediment removal phase of the Project. Currently, both areas consist of a mix of scoured streambed, riparian woodland, and mulefat thicket habitat types. Adjacent habitat types include scoured streambed, black willow thickets and mulefat thickets.

Planned Activities:

1. Planting and seeding with native riparian species.
2. Remove non-native/invasive plant species from approximately 0.7 acres within DG-7, and 0.3 acres within DG-8.

DG-1

DG-1 is a narrow 4.88-acre area located on the east side of channel at the upper end of the Reservoir. Currently, the area consists of disturbed California sagebrush/buckwheat scrub and small patches of RAFSS vegetation along the edges of the Reservoir channel. The area experiences moderate use from pedestrian travel via a narrow secondary trail that runs through the northern portion of the area.

Planned Activities:

1. Planting and seeding with native species.
2. Remove non-native/invasive plant species from approximately 3.5 acres within the mitigation area.



ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS



TERRACOSTA CONSULTING GROUP
ENGINEERS AND GEOLOGISTS
3890 MURPHY CANYON ROAD, SUITE 200
SAN DIEGO, CA 92123 (858) 673-6900

FIGURE NUMBER

4

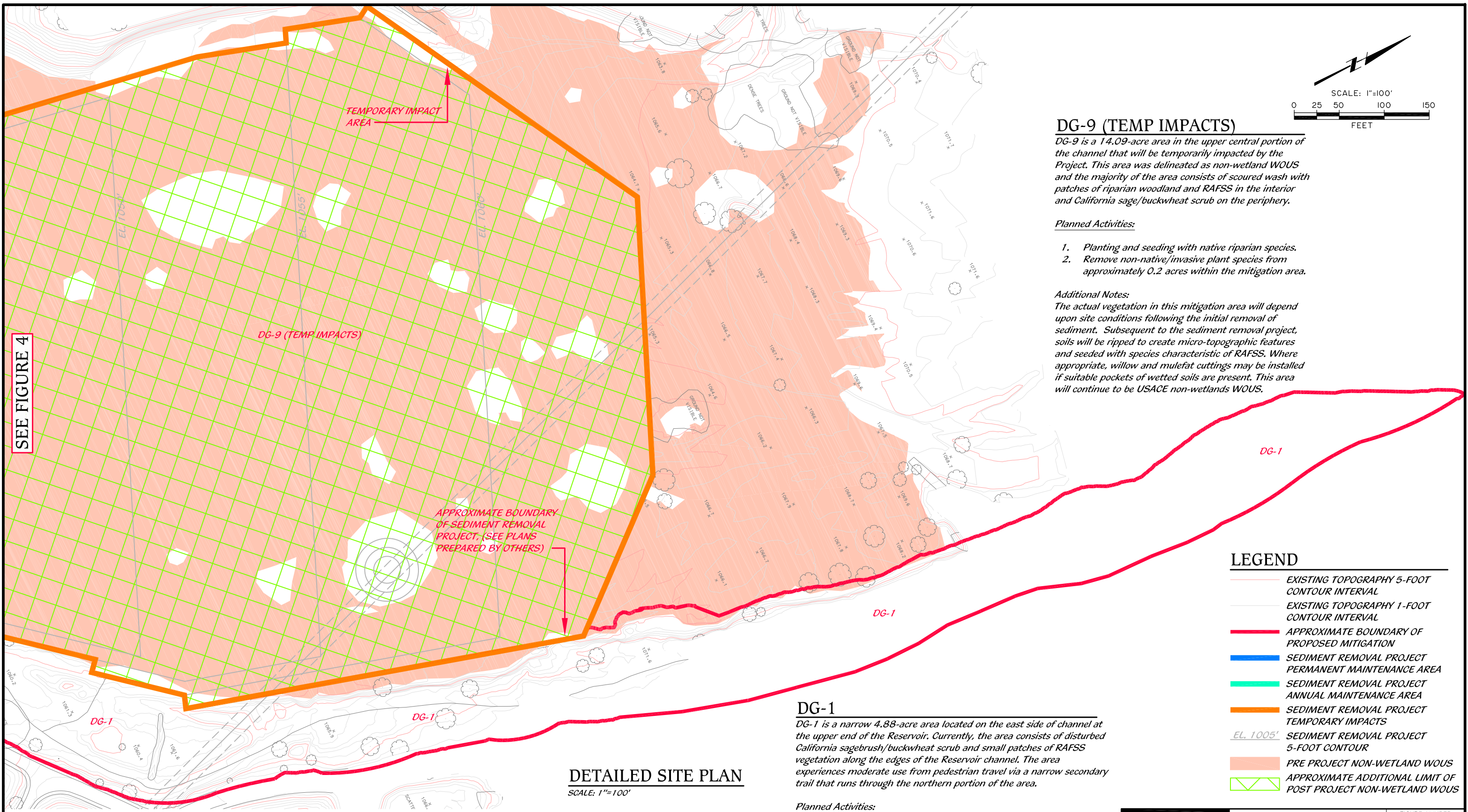
PROJECT NAME

DEVIL'S GATE RESERVOIR

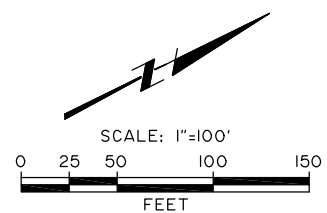
PROPOSAL NUMBER

3019

POST SEDIMENT REMOVAL
DETAILED SITE PLAN



SEE FIGURE 4



DG-9 (TEMP IMPACTS)

DG-9 is a 14.09-acre area in the upper central portion of the channel that will be temporarily impacted by the Project. This area was delineated as non-wetland WOUS and the majority of the area consists of scoured wash with patches of riparian woodland and RAFSS in the interior and California sage/buckwheat scrub on the periphery.

Planned Activities:

1. Planting and seeding with native riparian species.
2. Remove non-native/invasive plant species from approximately 0.2 acres within the mitigation area.

Additional Notes:

The actual vegetation in this mitigation area will depend upon site conditions following the initial removal of sediment. Subsequent to the sediment removal project, soils will be ripped to create micro-topographic features and seeded with species characteristic of RAFSS. Where appropriate, willow and mulefat cuttings may be installed if suitable pockets of wetted soils are present. This area will continue to be USACE non-wetlands WOUS.

APPROXIMATE BOUNDARY OF SEDIMENT REMOVAL PROJECT, (SEE PLANS PREPARED BY OTHERS)

DETAILED SITE PLAN
SCALE: 1"=100'

DG-1

DG-1 is a narrow 4.88-acre area located on the east side of channel at the upper end of the Reservoir. Currently, the area consists of disturbed California sagebrush/buckwheat scrub and small patches of RAFSS vegetation along the edges of the Reservoir channel. The area experiences moderate use from pedestrian travel via a narrow secondary trail that runs through the northern portion of the area.

Planned Activities:

1. Planting and seeding with native species.
2. Remove non-native/invasive plant species from approximately 3.5 acres within the mitigation area.

LEGEND

- EXISTING TOPOGRAPHY 5-FOOT CONTOUR INTERVAL
- EXISTING TOPOGRAPHY 1-FOOT CONTOUR INTERVAL
- APPROXIMATE BOUNDARY OF PROPOSED MITIGATION
- SEDIMENT REMOVAL PROJECT PERMANENT MAINTENANCE AREA
- SEDIMENT REMOVAL PROJECT ANNUAL MAINTENANCE AREA
- SEDIMENT REMOVAL PROJECT TEMPORARY IMPACTS
- EL. 1005' SEDIMENT REMOVAL PROJECT 5-FOOT CONTOUR
- PRE PROJECT NON-WETLAND WOUS
- APPROXIMATE ADDITIONAL LIMIT OF POST PROJECT NON-WETLAND WOUS












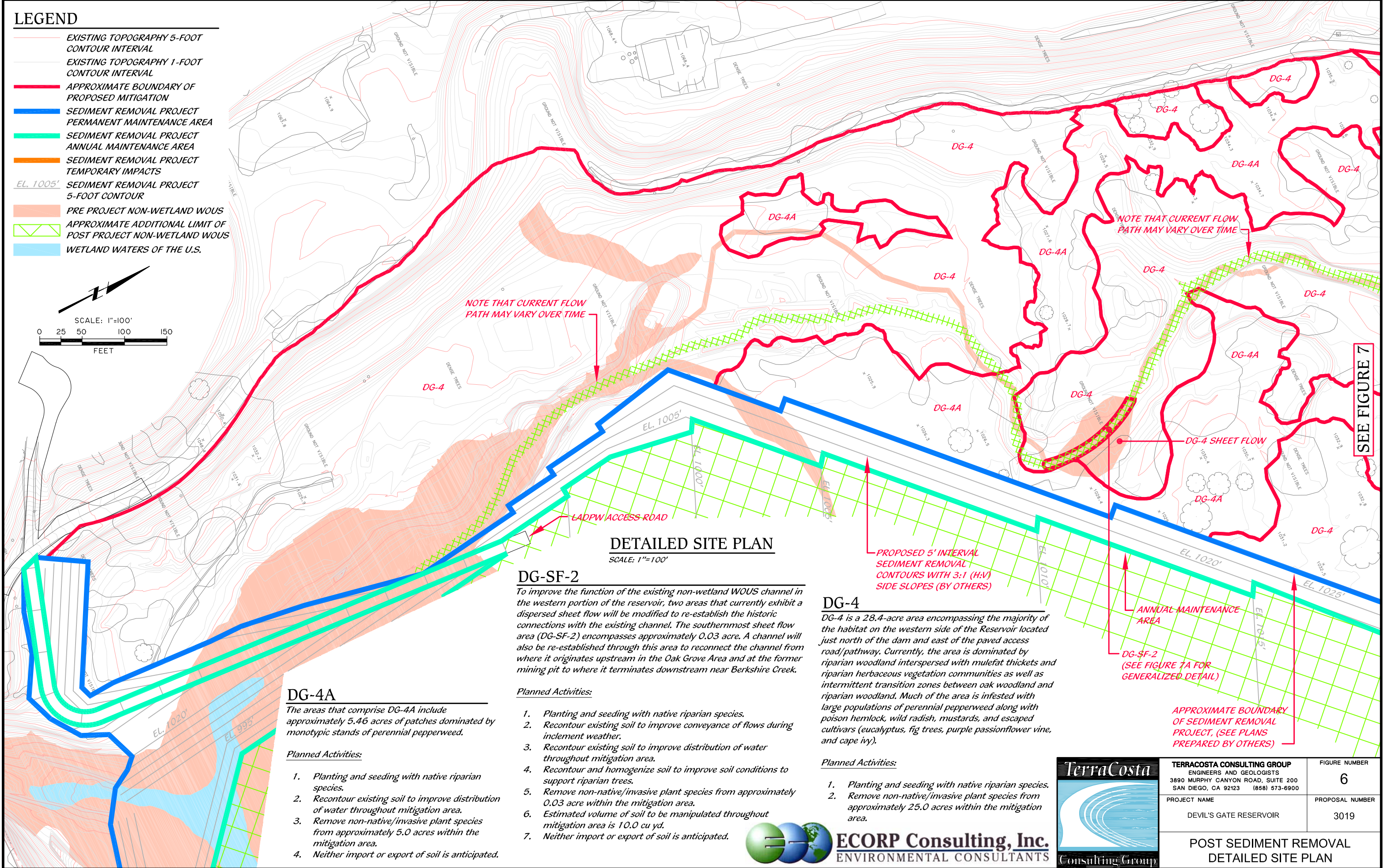
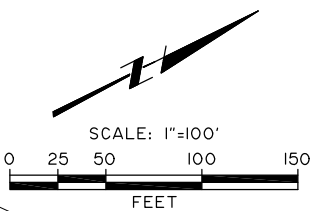
TERRACOSTA CONSULTING GROUP ENGINEERS AND GEOLOGISTS 3890 MURPHY CANYON ROAD, SUITE 200 SAN DIEGO, CA 92123 (858) 573-6900		FIGURE NUMBER 5
PROJECT NAME DEVIL'S GATE RESERVOIR		PROPOSAL NUMBER 3019



**POST SEDIMENT REMOVAL
DETAILED SITE PLAN**

LEGEND

-  EXISTING TOPOGRAPHY 5-FOOT CONTOUR INTERVAL
-  EXISTING TOPOGRAPHY 1-FOOT CONTOUR INTERVAL
-  APPROXIMATE BOUNDARY OF PROPOSED MITIGATION
-  SEDIMENT REMOVAL PROJECT PERMANENT MAINTENANCE AREA
-  SEDIMENT REMOVAL PROJECT ANNUAL MAINTENANCE AREA
-  SEDIMENT REMOVAL PROJECT TEMPORARY IMPACTS
-  EL. 1005' SEDIMENT REMOVAL PROJECT 5-FOOT CONTOUR
-  PRE PROJECT NON-WETLAND WOUS
-  APPROXIMATE ADDITIONAL LIMIT OF POST PROJECT NON-WETLAND WOUS
-  WETLAND WATERS OF THE U.S.



DETAILED SITE PLAN
SCALE: 1"=100'

DG-SF-2

To improve the function of the existing non-wetland WOUS channel in the western portion of the reservoir, two areas that currently exhibit a dispersed sheet flow will be modified to re-establish the historic connections with the existing channel. The southernmost sheet flow area (DG-SF-2) encompasses approximately 0.03 acre. A channel will also be re-established through this area to reconnect the channel from where it originates upstream in the Oak Grove Area and at the former mining pit to where it terminates downstream near Berkshire Creek.

Planned Activities:

1. Planting and seeding with native riparian species.
2. Recontour existing soil to improve conveyance of flows during inclement weather.
3. Recontour existing soil to improve distribution of water throughout mitigation area.
4. Recontour and homogenize soil to improve soil conditions to support riparian trees.
5. Remove non-native/invasive plant species from approximately 0.03 acre within the mitigation area.
6. Estimated volume of soil to be manipulated throughout mitigation area is 10.0 cu yd.
7. Neither import or export of soil is anticipated.

DG-4A

The areas that comprise DG-4A include approximately 5.46 acres of patches dominated by monotypic stands of perennial pepperweed.

Planned Activities:

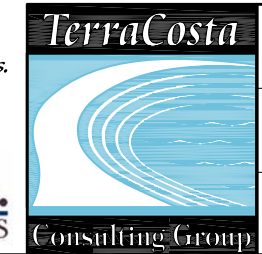
1. Planting and seeding with native riparian species.
2. Recontour existing soil to improve distribution of water throughout mitigation area.
3. Remove non-native/invasive plant species from approximately 5.0 acres within the mitigation area.
4. Neither import or export of soil is anticipated.

DG-4

DG-4 is a 28.4-acre area encompassing the majority of the habitat on the western side of the Reservoir located just north of the dam and east of the paved access road/pathway. Currently, the area is dominated by riparian woodland interspersed with mulefat thickets and riparian herbaceous vegetation communities as well as intermittent transition zones between oak woodland and riparian woodland. Much of the area is infested with large populations of perennial pepperweed along with poison hemlock, wild radish, mustards, and escaped cultivars (eucalyptus, fig trees, purple passionflower vine, and cape ivy).

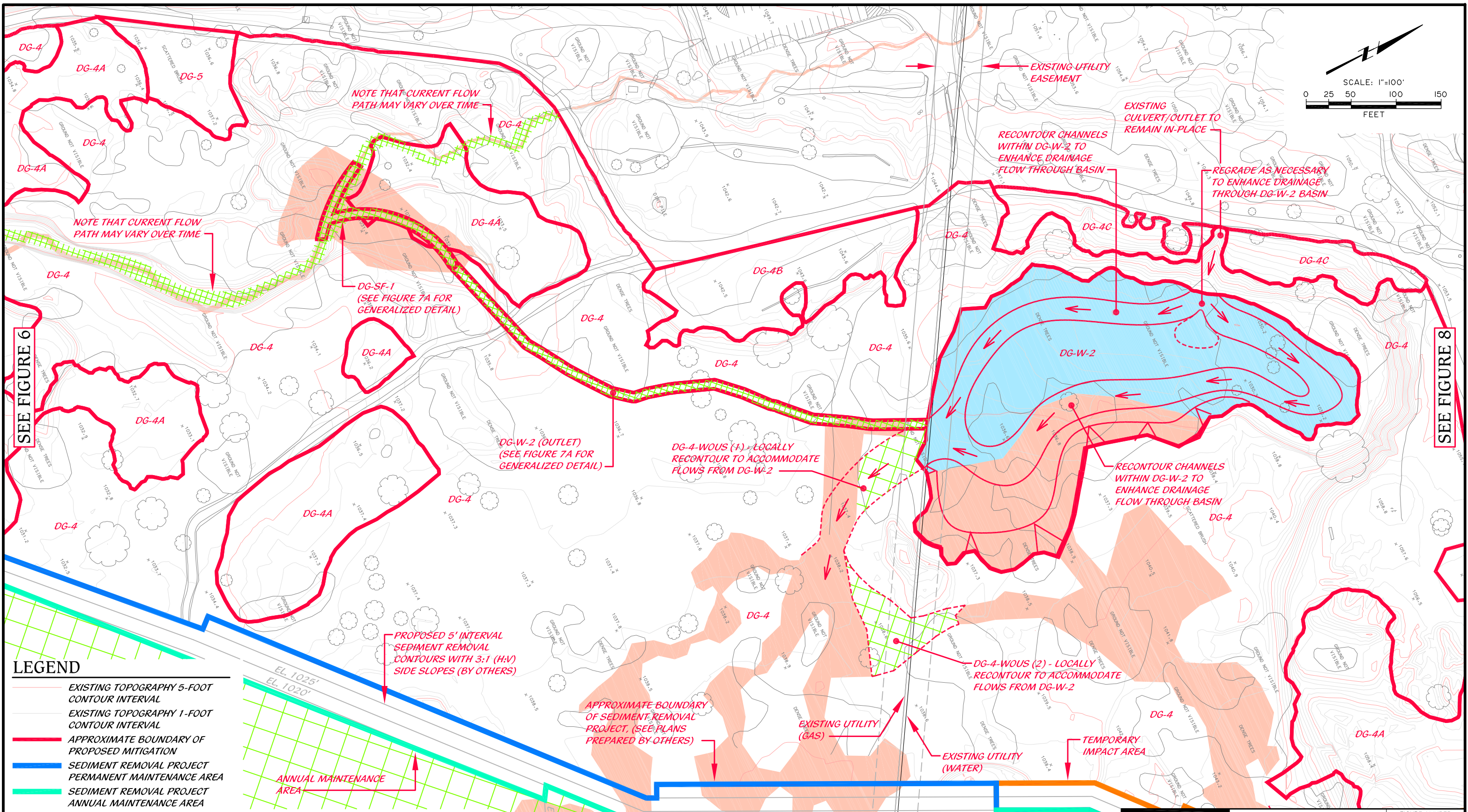
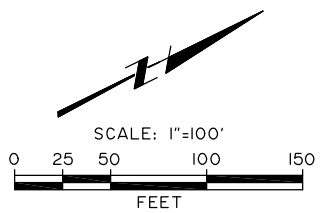
Planned Activities:

1. Planting and seeding with native riparian species.
2. Remove non-native/invasive plant species from approximately 25.0 acres within the mitigation area.



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PROJECT NAME DEVIL'S GATE RESERVOIR		PROPOSAL NUMBER 3019

**POST SEDIMENT REMOVAL
DETAILED SITE PLAN**



SEE FIGURE 6

SEE FIGURE 8

- LEGEND**
- EXISTING TOPOGRAPHY 5-FOOT CONTOUR INTERVAL
 - EXISTING TOPOGRAPHY 1-FOOT CONTOUR INTERVAL
 - APPROXIMATE BOUNDARY OF PROPOSED MITIGATION
 - SEDIMENT REMOVAL PROJECT PERMANENT MAINTENANCE AREA
 - SEDIMENT REMOVAL PROJECT ANNUAL MAINTENANCE AREA
 - SEDIMENT REMOVAL PROJECT TEMPORARY IMPACTS
 - EL. 1005' SEDIMENT REMOVAL PROJECT 5-FOOT CONTOUR
 - PRE PROJECT NON-WETLAND WOUS
 - APPROXIMATE ADDITIONAL LIMIT OF POST PROJECT NON-WETLAND WOUS
 - WETLAND WATERS OF THE U.S.

NOTES

SEE FIGURE 6 FOR DESCRIPTIONS OF WORK FOR AREAS DG-4 & DG-4A.

SEE FIGURE 7A FOR DESCRIPTIONS OF WORK FOR AREAS DG-SF-1, DG-4B, DG-4C, DG-5, DG-W-2 & DG-W-2 (OUTLET).

DETAILED SITE PLAN
SCALE: 1"=100'



TERRACOSTA CONSULTING GROUP ENGINEERS AND GEOLOGISTS 3890 MURPHY CANYON ROAD, SUITE 200 SAN DIEGO, CA 92123 (858) 573-6900		FIGURE NUMBER 7
PROJECT NAME DEVIL'S GATE RESERVOIR		PROPOSAL NUMBER 3019
POST SEDIMENT REMOVAL DETAILED SITE PLAN		

DG-SF-1 & DG-SF-2

To improve the function of the existing non-wetland WOUS channel in the western portion of the reservoir, two areas that currently exhibit a dispersed sheet flow will be modified to re-establish the historic connections with the existing channel. The northernmost sheet flow area (DG-SF-1) encompasses approximately 0.08 acre. At the point where the re-established outflow channel from the former mining pit enters this sheet flow area, the channel will be re-established and connected with the channels that enter from the Oak Grove area and the former mining pit. The southernmost sheet flow area (DG-SF-2) encompasses approximately 0.03 acres. This will re-establish the connections of the two channels with the existing non-wetland WOUS channel that proceeds through the western portion of the reservoir to Berkshire Creek, (i.e., DG-4-Drainage).

Planned Activities:

1. Planting and seeding with native riparian species.
2. Recontour existing soil to improve conveyance of flows during inclement weather.
3. Recontour existing soil to improve distribution of water throughout mitigation area.
4. Recontour and homogenize soil to improve soil conditions to support riparian trees.
5. Remove non-native/invasive plant species from approximately 0.05 acre within DG-SF-1 & 0.03 acres within DG-SF-2.
6. Estimated volume of soil to be manipulated throughout mitigation area is 31.0 cu yd within DG-SF-1 & 10 cu yd within DG-SF-2.
7. Neither import or export of soil is anticipated.

DG-4B

DG-4B is a 0.54-acre area on the far west side of the Reservoir immediately adjacent to the pedestrian pathway and east of the Lower Oak Grove Parking Lot. Currently, the area consists of disturbed bare ground with patches of exotic annuals including horehound, mustards, poison hemlock, and perennial pepperweed. Adjacent vegetation communities include mulefat thickets and patches of willow thickets to the north, east, and south and disturbed areas to the west.

Planned Activities:

1. Planting and seeding with native riparian species.
2. Remove non-native/invasive plant species from approximately 0.54 acre within the mitigation area.

DG-4C

DG-4C is a 0.45-acre area on the far west side of the Reservoir immediately adjacent to the pedestrian pathway and northeast of the Oak Grove Park lower parking lot. Currently, the area consists of disturbed riparian scrub habitat with patches of exotic annuals, including nonnative grasses and mustards. Adjacent vegetation communities include willow thickets to the east and south and disturbed areas to the west.

Planned Activities:

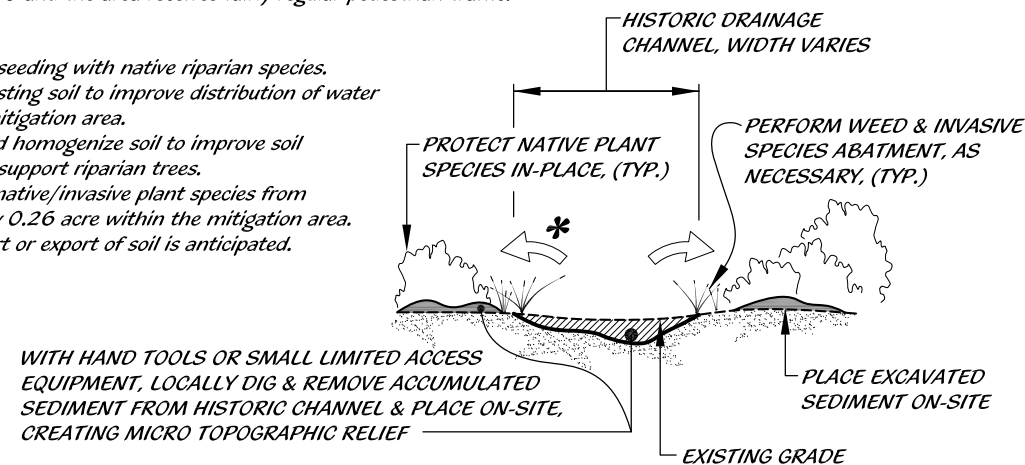
1. Planting and seeding with native riparian species.
2. Remove non-native/invasive plant species from approximately 0.45 acre within the mitigation area.

DG-5

DG-5 is a 0.26-acre area on the far west side of the Reservoir immediately adjacent to the pedestrian pathway and the larger enhancement area DG-4. Currently, the area consists of compacted disturbed bare ground with patches of riparian scrub. Adjacent vegetation communities include riparian woodland on the north, east, and west sides and oak woodland on the opposite side of the pathway to the west. One of the baskets from the disc golf course is located within DG-5 and the area receives fairly regular pedestrian traffic.

Planned Activities:

1. Planting and seeding with native riparian species.
2. Recontour existing soil to improve distribution of water throughout mitigation area.
3. Recontour and homogenize soil to improve soil conditions to support riparian trees.
4. Remove non-native/invasive plant species from approximately 0.26 acre within the mitigation area.
5. Neither import or export of soil is anticipated.



DG-SF-1 & DG-SF-2 GENERALIZED DETAIL

NOT TO SCALE

DG-W-2 (Mining Pit)

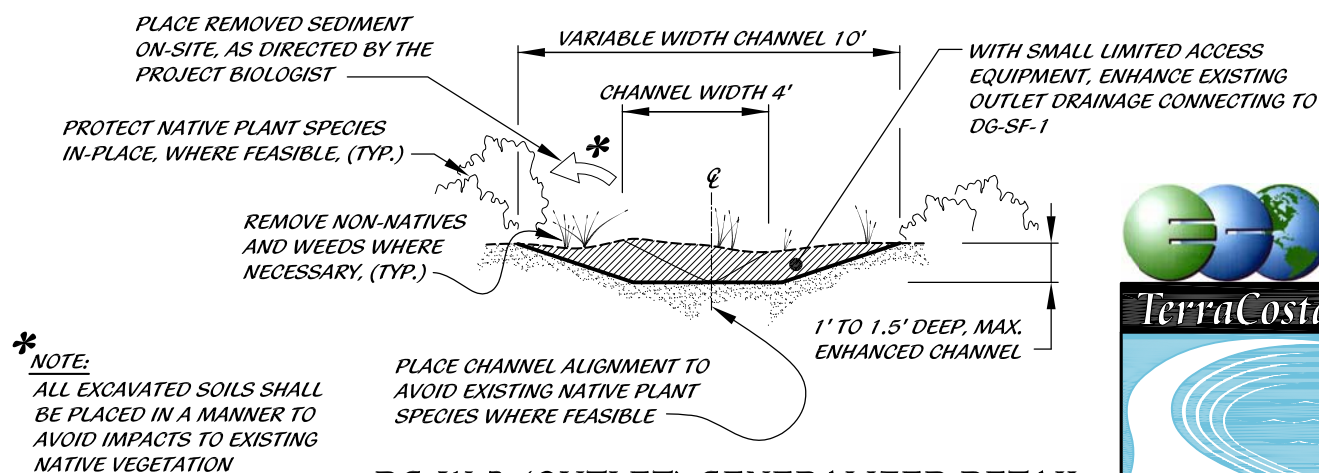
DG-W-2 is a 2.13-acre area on the west side of the Reservoir that is surrounded by the DG-4 enhancement area. The area is located within a topographic depression that was created when the area was historically mined. The majority of DG-W-2 has been delineated as USACE jurisdictional wetlands. This area has a history of inundation following storm events, which is evident in historic aerial photographs. In addition to inundation, the former mining pit receives sheet flows from the Oak Grove Area of Hahamongna Watershed Park through a culvert under the road located to the west of the mining pit. Flow also historically entered the pit from the east during high flows as evidenced by the presence of jurisdictional non-wetland WOUS sheet flow area located east of the pit. DG-W-2 currently supports vegetation that is typical of both wetland and riparian habitat. Vegetation within this area was a mix of non-native plants in areas with high clay content, surrounded by thickets of mulefat (*Baccharis salicifolia*) and black willow (*Salix gooddingii*) in areas where soil appeared to be higher sand content. Black willow thickets had willows ranging from approximately 10 to 20 feet in height with trunks having diameter at breast height of four to six inches. The area closest to the existing culvert outlet (on western bank) has a prevalence of accumulated soils that seem to range in texture from sand, silty sand, silty clay, clay loam, to sandy loam (determined by visual examination, texture analysis was not performed). Much of this accumulated soil has likely been deposited into this area during storm events. Excavations into the soil profile (by-hand) revealed that accumulated sediments with clays and silts may only be present within the first 12 to 18 inches of soil. Adjacent vegetation communities include disturbed California sagebrush/buckwheat scrub to the north, riparian woodland/mulefat thickets to the south and east, and developed areas to the west. Overflow exits DG-W-2 to the south and when it encounters a heavily used trail, it is diverted to the south as evidenced by multiple sheet flow channels running east towards the main channel. Evidence of inundation from the south is also present, which is likely a result of filling of the reservoir during heavy storms.

Planned Activities:

1. Planting and seeding with native riparian species.
2. Recontour existing soil in select areas to improve conveyance of flows during inclement weather.
3. Recontour existing soil in select areas to improve distribution of water throughout mitigation area.
4. Recontour and homogenize existing soil in select areas to improve soil conditions to support riparian trees.
5. Improve hydrology so that connection with DG-W-2 (Outlet) and existing non-wetland WOUS in DG-4 occurs.
6. Remove non-native/invasive plant species from approximately 0.6 acre within the mitigation area.
7. Estimated volume of soil to be manipulated throughout mitigation area is 4,000 cubic yards (cu yd).
8. Estimated area where soil manipulation will occur is 1.3 acres. Neither import or export of soil is anticipated.

Additional Notes:

Although additional wetland mitigation is not a goal for DG-W-2, if wetland habitat can be supported then the habitat restoration program will maintain these areas appropriately so that wetland vegetation will become well established and self-sustaining. Wetland vegetation will be planted as appropriate and the perimeter will be planted with willows and mulefat to form a multi-structured riparian habitat surrounding the basin. The post-project condition of this mitigation area will be riparian woodland and mulefat thickets, with a potential for additional USACE jurisdictional wetland.



DG-W-2-(OUTLET) GENERALIZED DETAIL

NOT TO SCALE

DG-W-2 (OUTLET)

DG-W-2 (Outlet) is a 0.13-acre channel area that will be re-established on the southwest side of the former mining pit (DG-W-2). At present, the outflow channel from the former mining pit intersects a heavily used trail and the flow is diverted along the trail towards the main drainage channel. Currently, the area where the channel will be re-established is vegetated with a patchy distribution of mulefat scrub and riparian woodland/scrub. The understory of the existing habitat contains an abundance of perennial pepperweed and other nonnative plants. To improve the function of the rehabilitated wetland in the former mining pit and to allow flow to return to the historic flow path to the western portion of the reservoir, a non-wetland WOUS channel will be reestablished. The location of where the channel exits the former mining pit will remain approximately the same but the channel will be re-established by removing the sediment that has created the diversion to the south and re-contouring the channel. The re-established channel will be approximately 475 feet long and the width will approximately match the existing outflow channel and the existing channel where the connection will be re-established (approximately 4 to 10 feet wide). The trail that has caused the diversion of this drainage in the past will be closed. Approximately 0.13 acre of non-wetland WOUS will be reestablished, which will result in a return of natural flow from the mining pit to the western portion of the reservoir. Existing native plants will be avoided to the extent possible during the construction of the channel. Invasive and nonnative plants and weeds will be removed and willows and mulefat will be planted along the banks of the re-established channel, where appropriate, to create or restore the riparian woodland/scrub.

Planned Activities:

1. Planting and seeding with native riparian species.
2. Recontour existing soil to improve conveyance of flows during inclement weather.
3. Recontour existing soil to improve distribution of water throughout mitigation area.
4. Recontour and homogenize soil to improve soil conditions to support riparian trees.
5. Improve hydrology so that DW-W-2 can convey flows to DG-4 (Drainage).
6. Remove non-native/invasive plant species from approximately 0.1 acre within the mitigation area.
7. Estimated volume of soil to be manipulated throughout mitigation area is 260.0 cu yd.
8. Neither import or export of soil is anticipated.

DG-4-WOUS CONNECTIONS (RE-ESTABLISHMENT)

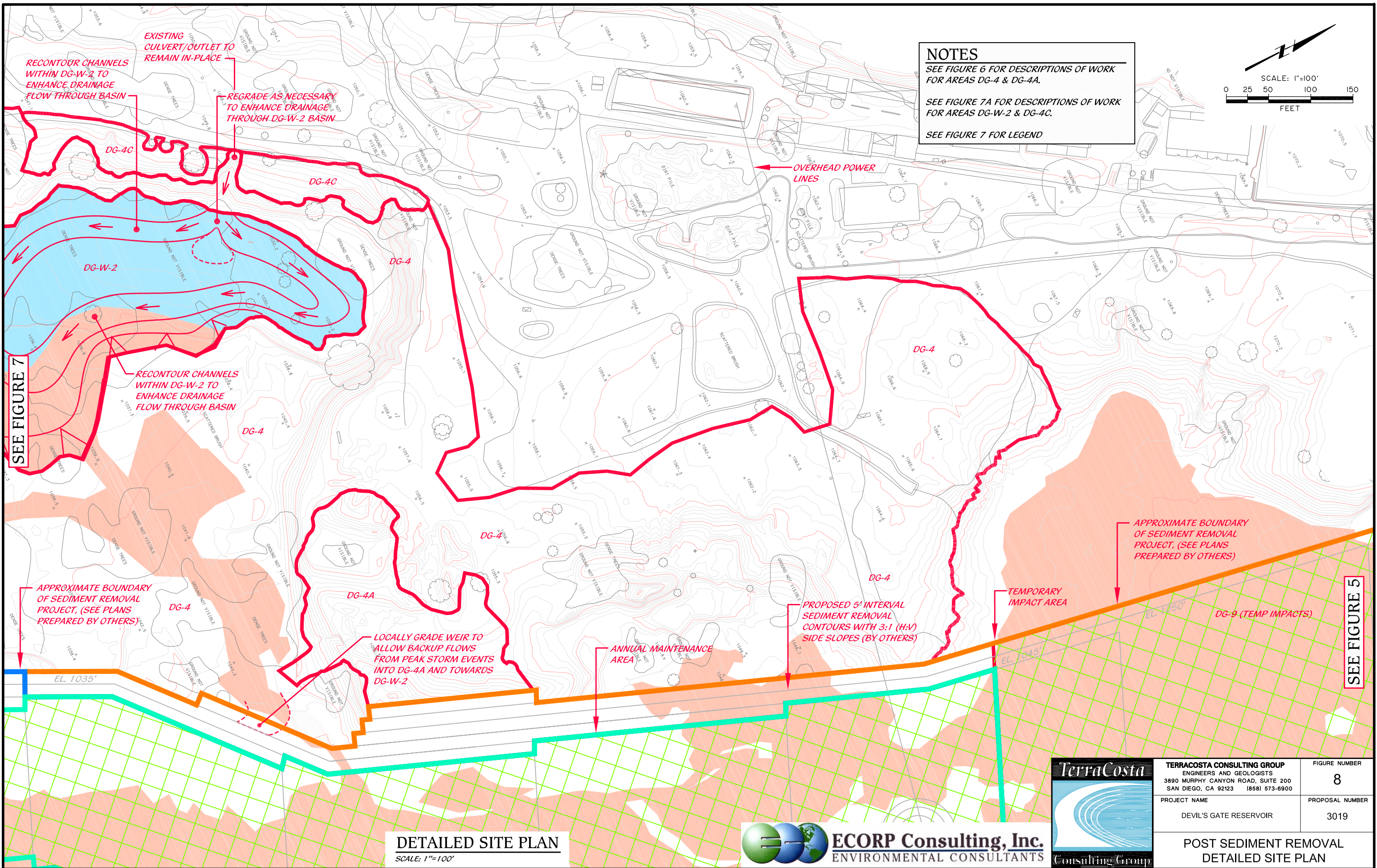
DG-4-WOUS Connections comprises two areas with a combined acreage of approximately 0.22-acre. These two mitigation areas serve to re-establish non-wetland WOUS in two locations: (1) from the mining pit to existing non-wetland WOUS located in DG-4, and (2) as a connection between two existing non-wetland WOUS areas within DG-4. Both mitigation areas are on the west side of the Reservoir, within DG-4 and east of DG-W-2 (Mining Pit) and DG-W-2 (Outlet). These two mitigation areas will allow for flows from DG-W-2 to reach existing non-wetland WOUS, and then flow to the side slopes of the western edge of the reservoir. In addition, the second mitigation area will allow flows to move in a southerly direction from existing non-wetland WOUS (when the Reservoir is filled with water) to the other section of non-wetland WOUS immediately to the south. The area where these channels will be formed is currently a mix of sparse riparian tree species, mulefat thickets, and non-native infestations of perennial pepperweed, poison hemlock, and other nonnative species. During formation of these non-wetland WOUS avoidance of native plants will be achieved to the maximum extent practicable. Ultimately, the DG-4-WOUS Connections will re-establish non-wetland WOUS through DG-4 and provide for connections to other existing non-wetland WOUS areas.

Specifically, DG-4-WOUS Connections will be recontoured to improve conveyance of flows during inclement weather. In addition, soil manipulation during formation of channels will improve distribution of water in DG-4 and improve soil conditions to support growth of riparian trees. Following removal of non-native and invasive plant species from approximately 0.01 acre of DG-4, planting and seeding with native riparian trees and shrubs will occur so that black willow woodland can grow and persist and improve the hydrological function of this area.

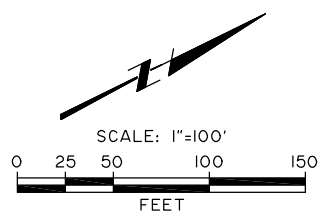
Planned Activities:

1. Planting and seeding with native riparian species.
2. Recontour existing soil to improve conveyance of flows during inclement weather.
3. Recontour existing soil to improve distribution of water throughout mitigation area.
4. Improve hydrology so that DG-W-2 can convey flows to non-wetland WOUS in DG-4.
5. Improve hydrology so that a connection is established between two areas of non-wetland WOUS in DG-4.
6. Remove non-native/invasive plant species from approximately 0.01 acre within the mitigation area.
7. Estimated volume of soil to be manipulated throughout mitigation area is 20.0 cu yd.
8. Neither import or export of soil is anticipated.

	ECORP Consulting, Inc. ENVIRONMENTAL CONSULTANTS	FIGURE NUMBER 7A
	TERRACOSTA CONSULTING GROUP ENGINEERS AND GEOLOGISTS 3890 MURPHY CANYON ROAD, SUITE 200 SAN DIEGO, CA 92123 (858) 673-6900	PROJECT NAME DEVIL'S GATE RESERVOIR
POST SEDIMENT REMOVAL FIGURE 7 DESCRIPTIONS OF WORK		



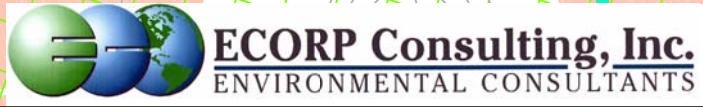
NOTES
 SEE FIGURE 6 FOR DESCRIPTIONS OF WORK FOR AREAS DG-4 & DG-4A.
 SEE FIGURE 7A FOR DESCRIPTIONS OF WORK FOR AREAS DG-W-2 & DG-4C.
 SEE FIGURE 7 FOR LEGEND



SEE FIGURE 7

SEE FIGURE 5

DETAILED SITE PLAN
 SCALE: 1"=100'



TERRACOSTA CONSULTING GROUP ENGINEERS AND GEOLOGISTS 3890 MURPHY CANYON ROAD, SUITE 200 SAN DIEGO, CA 92123 (858) 573-6900		FIGURE NUMBER 8
PROJECT NAME DEVIL'S GATE RESERVOIR		PROPOSAL NUMBER 3019

**POST SEDIMENT REMOVAL
 DETAILED SITE PLAN**

FUND DESIGNATION AND CREDIT

Issue Date: September 26, 2018

Beneficiary:

California Department of Fish and Wildlife
1416 Ninth Street, 12th Floor
Sacramento, CA 95814
Attn: HCPB Mitigation Account Coordinator

Amount: U.S. \$14,000,000 (fourteen million dollars)

Expiry: July 1, 2038 at our counters

Dear Sirs:

1. At your request, The Los Angeles County Flood Control District (“Applicant”), hereby establishes in favor of the California Department of Fish and Wildlife (“CDFW”), this fund designation and credit (“Credit”) in the principal sum of U.S. \$14,000,000 (fourteen million dollars) (“Principal Sum”).
2. This Credit is and has been established for the benefit of the CDFW pursuant to the terms of the Streambed Alteration Agreement No. 1600-2015-0263-R5 (“SAA”) and the Incidental Take Permit No. 2081-2016-031-05 (“ITP”) for the Devil’s Gate Reservoir Sediment Removal and Management project (“Project”) issued by the CDFW to the Applicant on March 21, 2017 and July 16, 2018 respectively.
3. Further, the Applicant has agreed to complete certain mitigation requirements, as set forth in all of Condition 3 in the SAA, and all of Condition 8 in the ITP, and detailed in the Project’s Habitat Restoration Plan.
4. This Credit is intended by the CDFW and the Applicant to serve as a security device for the performance by the Applicant of the Mitigation Milestones as defined in the Project’s Habitat Restoration Plan and attached hereto as Attachment A.
5. The CDFW shall be entitled to draw upon this Credit only by presentation of a duly executed Certificate for Drawing in the same form as Attachment B, which is attached hereto.
6. The Certificate of Drawing shall be completed and signed by the Authorized Representatives of the CDFW as defined in paragraph 12 below. The CDFW will

give notice to the Applicant that it will present a fully executed Certificate of Drawing (Attachment B) thirty days prior to the date the Certificate is so presented. Presentation by the CDFW of a completed Certificate of Drawing may be made in person or by registered mail. Presentation of the Certificate of Drawing is limited to one request per year.

7. Upon presentation of a duly executed Certificate of Drawing as above provided, payment shall be made to the CDFW, or to the account of the CDFW, in immediately available funds, as the CDFW shall specify.
8. All drawings under this Credit shall be paid with the Applicant's funds. Each drawing honored by the Applicant hereunder shall reduce, *pro tanto*, the Principal Sum. Applicant's payment to the CDFW of an amount demanded in accordance herewith, does not constitute an agreement by the Applicant that the amount demanded is correct; an admission that the basis for the CDFW's request is valid; nor, is it a waiver of any claims the Applicant may have to recover the amount so paid. By paying to the CDFW an amount demanded in accordance herewith, the CDFW releases the Applicant from any obligation to complete that mitigation milestone or associated mitigation requirements.
9. The Applicant shall be entitled to reduce the Principal Sum only by presentation of a duly executed Certificate of Mitigation Milestone Completion ("CMMC") which: (i) shall be in the form of Attachment C, which is attached hereto, and (ii) shall be completed and signed by Authorized Representatives of the Applicant as defined in paragraph 12 below. Submittal by the Applicant of a completed CMMC to the CDFW may be made in person or by registered mail. Presentation of the CMMC is limited to one request per year.
10. The Applicant shall submit to the CDFW for its approval the duly executed CMMC before it may reduce the Principal Sum. The CDFW shall indicate its approval by returning a signed copy of the CMMC by the CDFW Authorized Representative in Attachment C to the Applicant.
11. This Credit will be cancelled upon receipt by the Applicant of a Certificate of Release from the CDFW, which: (i) shall be in the form of Attachment D, which is attached hereto, and (ii) shall be completed and signed by the Authorized Representatives of the CDFW as set forth in Attachment D. Presentation by the CDFW of a completed Certificate of Release may be made in person or by registered mail.
12. The "Authorized Representatives" shall mean
 - a. For the CDFW: (1) the Director or a Regional Manager of the California Department of Fish and Wildlife or their designee, and (2) the General Counsel of the CDFW or their designee,

- b. For the Applicant: (1) Chief Engineer of the Los Angeles County Flood Control District or their designee.

13. This Credit shall be automatically extended without amendment for additional periods of one year from the present or any future expiration date hereof, unless at least sixty (60) days prior to any such date, the Applicant notifies the CDFW in writing by registered mail, return receipt requested, or by overnight courier that the Applicant elects not to consider this Credit extended for any such period.

14. Communications with respect to this Credit shall be in writing. The address for notices with respect to this Credit shall be:

- a. For the CDFW: Written notices, reports and other communications shall be delivered by registered first class mail at the following address, or at addresses the CDFW may subsequently provide the Applicant. Notices, reports, and other communications shall reference the Project name, Applicant, and SAA Number (1600-2015-0263-R5) and ITP Number (2081-2016-031-05) in a cover letter and on any other associated documents to:

- i. Mr. Ed Pert, Regional Manager
C/o Steve Gibson
California Department of Fish and Wildlife
3883 Ruffin Rd.
San Diego, CA 92123; and copy to:

- ii. Habitat Conservation Planning Branch
California Department of Fish and Wildlife
Attn: CESA Permitting Program
1416 Ninth Street, Suite 1266
Sacramento, California 95814; and

- b. For the Applicant:

- i. Los Angeles County Department of Public Works
Attn: Water Resources Division
900 South Fremont Avenue
Alhambra, CA 91801

15. This Credit may not be transferred.

16. This Credit shall, if not canceled, expire on July 1, 2038 or any agreed, extended expiration date.

17. The Applicant hereby agrees with the CDFW that documents presented in compliance with the terms of this Credit will be duly honored upon presentation, as specified herein.

18. The CDFW hereby agrees with the Applicant that documents presented in compliance with the terms of this Credit will be duly honored upon presentation, as specified herein.

19. This Credit sets forth in full the terms of the Applicant's undertaking. Such undertaking shall not in any way be modified, amended or amplified by reference to any document or instrument referred to herein or in which this Credit is referred to or to which this Credit relates and any such reference shall not be deemed to incorporate herein by reference any document or instrument.

Los Angeles County Flood Control District

By: _____
Name: _____
Title: _____

California Department of Fish and Wildlife

By: _____
Name: _____
Title: _____

ATTACHMENT A

FUND DESIGNATION AND CREDIT
MITIGATION MILESTONES

ITEM*	Site Preparation and Implementation (50%)	Achievement of 3-Year Performance Standard (70%)	Achievement of 5-Year Performance Standard (90%)	Signoff (100%)
East Side Mitigation	\$750,000.00	\$250,00.00	\$120,000.00	\$150,000.00
Johnson Field Restoration	\$150,000.00	\$40,000.00	\$25,000.00	\$6,500.00
Lower Altadena Restoration	\$500,000.00	\$100,000.00	\$50,000.00	\$100,000.00
West Side Mitigation	\$1,900,000.00	\$780,000.00	\$450,000.00	\$350,000.00
Former Mining Pit Restoration	\$255,000.00	\$55,000.00	\$25,000.00	\$8,500.00
Temporary Impact Areas	\$850,000.00	\$315,000.00	\$125,000.00	\$245,000.00
Off-Site Mitigation Aquisition				\$6,400,000.00
TOTAL CREDIT				\$14,000,000.00

*Full description of each mitigation item is detailed in the Habitat Restoration Plan.

ATTACHMENT B

FUND DESIGNATION AND CREDIT
CERTIFICATE FOR DRAWING

To: Los Angeles County Department of Public Works
900 South Fremont Avenue
Alhambra, CA 98103
Attn: Water Resources Division

Re: Devil's Gate Reservoir Sediment Removal and Management Project
Streambed Alteration Agreement No. 1600-2015-0263-R5
Incidental Take Permit No. 2081-2016-031-05

The undersigned, the duly Authorized Representatives of the California Department of Fish and Wildlife ("CDFW"), hereby certify to the Applicant that:

1. **[Insert one of the following statements:** "In the opinion of the CDFW, the Applicant has failed to complete the mitigation milestone [*item*] referenced in Attachment A of the Credit." **or** "As set forth in paragraph 12, the Applicant has informed the CDFW that the Credit will not be extended and the Applicant has not provided the CDFW with an equivalent security approved by the CDFW to replace the Credit."]
2. The undersigned are authorized under the terms of the Credit to present this Certificate as the sole means of demanding payment on the Credit.
3. The CDFW is therefore making a drawing under the Credit in the amount of U.S. \$_____.
4. The remaining balance in the Principal Sum of the Credit is U.S. \$_____.
5. The amount demanded does not exceed the Principal Sum of the Credit.
6. Upon receipt of payment, the Applicant is released from further obligations to complete the mitigation milestone and associated mitigation requirements.

Therefore, the CDFW has executed and delivered this Certificate as of the ____ day of _____, _____.

CALIFORNIA DEPARTMENT OF FISH AND WILDLIFE

BY: _____

[Insert one of the following: "DIRECTOR" or "REGIONAL MANAGER, [*NAME OF REGIONAL OFFICE*"]]

BY: _____

GENERAL COUNSEL

ATTACHMENT C

FUND DESIGNATION AND CREDIT
CERTIFICATE FOR MITIGATION MILESTONE COMPLETION

To: California Department of Fish and Wildlife
Habitat Conservation Planning Branch
1416 Ninth Street, 12th Floor
Sacramento, California 95814
Attn: HCPB Mitigation Account Coordinator

Re: Devil's Gate Reservoir Sediment Removal and Management Project
Streambed Alteration Agreement No. 1600-2015-0263-R5
Incidental Take Permit No. 2081-2016-031-05

The undersigned, the duly Authorized Representative of the Applicant, hereby certifies to the California Department of Fish and Wildlife ("CDFW") that:

1. Based on information contained in the _____ **[report title]** _____ dated _____ **[date]** _____ the Applicant has successfully completed the mitigation milestone _____ **[item]** _____ at a value of U.S. \$_____.
2. The Applicant is therefore reducing the Principal Sum by an amount of U.S. \$_____.
3. The remaining balance in the Principal Sum of the Credit is U.S. \$_____.

Therefore, the Applicant has executed and delivered this Certificate for Mitigation Milestone Completion as of the _____ day of _____, _____.

LOS ANGELES COUNTY FLOOD CONTROL DISTRICT

BY: _____
CHIEF ENGINEER,

CALIFORNIA DEPARTMENT OF FISH AND WILDLIFE

BY: _____
[Insert one of the following: "DIRECTOR" or "REGIONAL MANAGER, [NAME OF REGIONAL OFFICE]"]

ATTACHMENT D

FUND DESIGNATION AND CREDIT
CERTIFICATE FOR RELEASE

To: Los Angeles County Department of Public Works
900 South Fremont Avenue
Alhambra, CA 98103
Attn: Water Resources Division

Re: Devil's Gate Reservoir Sediment Removal and Management Project
Streambed Alteration Agreement No. 1600-2015-0263-R5
Incidental Take Permit No. 2081-2016-031-05

The undersigned, the duly Authorized Representatives of the California Department of Fish and Wildlife ("CDFW"), hereby certifies to the Applicant that:

1. **[Insert one of the following statements:** "The Applicant has presented documentary evidence of full compliance with the Mitigation Milestones referenced in Attachment A of the Credit." **Or** "The natural expiration of this Credit has occurred."]

2. The CDFW therefore requests the release of the Credit.

Therefore, the CDFW has executed and delivered this Certificate for Release as of the ____ day of _____, _____.

CALIFORNIA DEPARTMENT OF FISH AND WILDLIFE

BY: _____

[Insert one of the following: "DIRECTOR" or "REGIONAL MANAGER, [**NAME OF REGIONAL OFFICE**"]