

GENERAL BIOLOGICAL REPORT

For The
Moreno Master Drainage Plan

Prepared For:

Albert A. Webb Associates
3788 McCray Street
Riverside, California 92506
Contact: Cheryl DeGano
(951) 320-6052

Prepared By:

Glenn Lukos Associates, Inc.
29 Orchard
Lake Forest, California 92630
Report Preparer: David Moskovitz
(949) 837-0404, ext. 42
(949) 837-5834 fax

February 27, 2012

TABLE OF CONTENTS

	Page
1.0 INTRODUCTION.....	1
1.1 Report Purpose.....	1
1.2 Project Location.....	1
1.3 Background and Project Description.....	1
1.4 Scope and Methodology.....	4
1.5 Existing Conditions.....	5
1.6 Relationship of the MDP to the MSHCP.....	5
2.0 METHODOLOGY.....	7
2.1 Botanical Resources.....	7
2.3 Wildlife Resources.....	8
2.4 MSHCP Riparian/Riverine Areas and Vernal Pools.....	10
2.5 Jurisdictional Waters.....	11
3.0 REGULATORY SETTING.....	17
3.1 State and/or Federally Listed Plants or Animals.....	17
3.2 California Environmental Quality Act.....	19
4.0 RESULTS.....	22
4.1 Vegetation Types/Land Uses.....	22
4.2 Special-Status Plants.....	28
4.3 Special-Status Animals.....	30
4.4 Nesting Birds.....	38
4.5 Raptor Foraging Habitat.....	38
4.6 Jurisdictional Waters.....	38
4.7 MSHCP Riparian/Riverine Areas and Vernal Pools.....	38
5.0 IMPACT ANALYSIS AND RECOMMENDED MEASURES.....	39
5.1 California Environmental Quality Act.....	39
5.2 Vegetation/Land Use Types.....	41
5.3 Special-Status Species.....	41
5.4 Raptor Foraging Habitat.....	44
5.5 Nesting Birds.....	44
5.6 Jurisdictional Waters.....	45
5.7 MSHCP Riparian/Riverine Areas and Vernal Pools.....	45
5.8 Indirect Impacts to Biological Resources.....	46

	Page
6.0 REFERENCES.....	46
7.0 CERTIFICATION	49

TABLES

Table 3-1. CNPS Lists	21
Table 4-1. Summary of MSHCP Vegetation Mapping for the MDP Project Area	22
Table 4-2. Special-Status Plants Evaluated for the MDP Project Area	28
Table 4-3. Special-Status Animals Evaluated for the MDP Project Area	28

EXHIBITS

- Exhibit 1 – Regional Map
- Exhibit 2 – Vicinity Map
- Exhibit 3 – Proposed Project (Albert A. Webb Associates Figure 2)
- Exhibit 4 – MSHCP Map
- Exhibit 5 – Vegetation Map
- Exhibit 6 – Site Photographs
- Exhibit 7 – Jurisdictional Waters Assessment
- Exhibit 8 – Soil Map

1.0 INTRODUCTION

1.1 Report Purpose

This report provides the results of general biological surveys and habitat assessments conducted by Glenn Lukos Associates, Inc. (GLA) for the Moreno Master Drainage Plan (MDP) located in the City of Moreno Valley, Riverside County, California. This report provides a program-level of assessment of the various proposed MDP Facilities, and the relationship of the MDP to the requirements of the Western Riverside County Multiple Species Habitat Conservation Plan (MSHCP), the California Environmental Quality Act (CEQA), and State and Federal regulations such as the Endangered Species Act (ESA), Clean Water Act (CWA), and the California Fish and Game Code.

1.2 Project Location

The Moreno MDP Project area occurs within the northeastern portion of Western Riverside County, California [Exhibit 1 – Regional Map]. The Moreno MDP Project area is located north and south of State Route (SR) 60, with the majority of the Moreno MDP located south of SR-60. The boundaries of the Moreno MDP area generally consist of Lassel Street to the west, Theodore Street to the east, Reche Canyon and San Timoteo Badlands foothills to the north, and Mount Russell foothills to the south. The Moreno MDP includes land within Moreno Valley and unincorporated Riverside County. The Moreno MDP Project area is depicted on the U.S. Geological Survey (USGS) Sunnymead Quadrangle Map [Exhibit 2 – Vicinity Map].

1.3 Background and Project Description

The Project proposes to revise the Moreno MDP to investigate and reevaluate the drainage problems of the Moreno Valley area and to develop an economically and environmentally sensitive drainage plan that considers flood protection for both existing and future development. The boundary of the plan usually follows regional watershed limits. Proposed facilities identified in an MDP may include channels, storm drains, levees, basins, dams, or any other conveyance capable of feasibly relieving flooding problems within the plan area. The Moreno MDP will consist of three separate components: Administration of the MDP, Future Construction of the MDP, and Future Operations and Maintenance of the MDP; hereinafter collectively referred to as the “Project.”

1.3.1 Administration of the MDP

The first component of the proposed Project being analyzed consists of the preparation and, ultimately, the adoption of the Moreno MDP as a long-range planning document. The Moreno MDP will be a guide for the alignment, type, size and cost of major proposed facilities (MDP Facilities) within the Moreno watershed to address the current and future drainage needs of Moreno Valley and the surrounding area. The drainage boundary of the Moreno MDP (MDP Boundary) is drawn to include all of the watershed area that contributes to the drainage problems in the community. The MDP Facilities would contain the 100-year flood discharge.

The Moreno MDP has a variety of planning uses. The Moreno MDP will be relied upon by the City of Moreno Valley (Moreno Valley) and Riverside County as it reviews and approves existing and proposed development in the MDP Boundary. New development may be required to construct MDP Facilities or set aside right-of-way for future MDP Facilities. The local jurisdictions can also use the Moreno MDP to identify MDP Facilities and costs for inclusion in capital improvement programs. Finally, the local jurisdictions can use the Moreno MDP for long-range planning of other public infrastructure projects like roads or utility pipelines.

1.3.2 Future Construction of the MDP

The second component of the Moreno MDP being analyzed in this Draft PEIR is the reasonably foreseeable impacts resulting from construction of the MDP Facilities. The MDP identifies the approximate location, size and type of MDP Facilities needed in order to alleviate and control flooding in the MDP Boundary. The Moreno MDP proposes the construction of approximately 30 miles of storm drainages and channels, and 50 acres of detention basins. The alignments and type of facilities depicted in the Moreno MDP can change as more detailed information becomes available during the design process. For example, the locations of underground utilities, new development patterns, right-of-way availability, hazardous materials sites, or the results of subsequent focused biological surveys may necessitate a shift in alignment or change in facility type. To add to that uncertainty, the construction of the MDP Facilities will be accomplished in discrete phases over a number of decades by different private entities and public agencies.

Despite this future environment of uncertainty and change, the proposed Project still must identify the general types of construction activities anticipated and the associated impacts. Subsequent CEQA analysis would be required when the individual MDP Facilities are designed and proposed for construction, but those future construction projects would tier from the forthcoming PEIR.

The Moreno MDP proposes a system of open channels, underground storm drains, and six basins, the conceptual location of which is presented in Figure 2 (Proposed Project – Moreno Master Drainage Plan Revision) as prepared by Albert A. Webb Associates [Exhibit 3 of this report].

1.3.3 Open Channels

The Moreno MDP proposes two types of open channels, lined and unlined channels.

Lined channels are usually trapezoidal shaped with concrete paving on the sides and bottom. Sides slope upward from the bottom at a rate of one foot vertically for every 1.5 feet horizontally. There will only be two lined channels; a section of the Line F southwest of Oliver Street to Grand Vista Drive with a bottom width ranging from 20 to 35 feet and a depth of nine feet, and a section of Line A west of the intersection of Locust Avenue and Quincy Street with a bottom width of six feet and depth of 4.5 feet.

Unlined channels are usually trapezoidal shaped, paved with rock-lined side slopes with a soft earthen bottom. Side slopes for unlined channels will run either 1.5 or 2 feet horizontally for

every foot of rise. Unlined channels in the Moreno MDP have a bottom width ranging from ten to thirty feet and a depth of six feet. Unlined channels require additional rights-of-way due to their wider cross sections.

Open channel rights-of-way for both lined and unlined facilities must accommodate the channel footprint plus areas needed for channel maintenance including access roads. Generally, channels with top widths less than 20 feet will require one access road; channels with top widths 20 feet or greater, require two access roads.

Open channels are generally considered the most economically feasible means of transporting large flood flows for any appreciable distance and are used wherever appropriate. In addition to their role as flow conveyors, open channels provide an outlet for the underground facilities proposed in the Moreno MDP as well as local drainage facilities to be built by developers and others. All of the open channels proposed in the Moreno MDP are intended to carry the runoff from a 100-year frequency storm.

1.3.4 Underground Storm Drains

The underground storm drains proposed by the Moreno MDP, generally consist of reinforced concrete pipe (RCP), ranging in size from 30 inches to 96 inches in diameter, and reinforced concrete box (RCB), which could be a square or rectangular “pipe” made of concrete with rebar or wire mesh fabric. A single “cell” of a RCB can be used, or multiple RCBs can be arranged sideways to make a pipe or tunnel like structure. Manholes are located as necessary for maintenance access with a maximum spacing of 500 feet. Catch basins are not specifically located until final design.

The underground drainage facilities are only proposed in those locations within the Moreno MDP where the application of open channels is not feasible, either because of topographic constraints or existing development (where possible, the underground storm drains proposed in the Moreno MDP are located in existing or future street rights-of-way). Most of the underground facilities within road rights-of-way are sized to carry the runoff generated by a 10-year storm event.

During a 100-year storm event, excess flow is expected to be carried in the street section above the facility. Otherwise, underground facilities are sized to convey the 100-year storm runoff.

1.3.5 Detention Basins and Debris Basin

The Moreno MDP proposes four detention basins and two debris basins. Detention basins’ use of temporary storage will reduce fairly high flow rates to substantially lower outflow rates. The debris basins will reduce the sediment downstream. The reduction of peak flows and debris allows for smaller, less costly facilities downstream of the basins. All four proposed detention basins are designed for ultimate 100-year storm events. The two proposed debris basins are designed for 10-year sediment yield from the watershed area. Flows exceeding the design capacity of a basin would pass over the emergency spillway in flow patterns approximating current conditions.

1.3.6 Future Operations and Maintenance of the MDP

The final component of the Moreno MDP to be analyzed is the reasonably foreseeable impact of future operation and maintenance activities. Once a facility is constructed it will require maintenance in order to retain flood control capacity. It is expected that the District will operate and maintain all of the MDP Facilities.

Maintenance of storm drains and concrete channels typically consists of keeping these facilities and their side drains clear of debris and sediment, as well as repairs to access roads and fences, and removing graffiti. On rare occasions, major repairs may be required following damaging storm events. Thus, major grading will not routinely occur while maintaining the underground storm drains and open concrete channels. To maintain the constructed facilities, the District will occasionally use equipment similar to the types used to construct the proposed facilities.

The District periodically inspects earthen channels and basins the routine maintenance of which will likely require the following activities: the removal of deposition, repair of eroded slopes, and reduction of fire hazards by annually mowing, and application of herbicides as well as the maintenance activities described in the previous paragraph. Vegetation must be removed or mowed, as necessary, to provide the designed hydraulic capacity. Any vegetation that may pose a fire hazard to adjacent structures must also be maintained. The design capacity of the facility and the frequency, duration, and velocity of runoff usually dictate the frequency of vegetation maintenance. Most facilities require some annual vegetation control.

Maintenance of the earthen facilities will also include occasional erosion repair and sediment removal. The frequency of these activities is a function of storm flows, and is difficult to estimate. The proposed earthen facilities are also more likely to be damaged by high velocity peak flows and more frequent storm events. While major repairs are expected to be relatively infrequent, RCFCWCD will occasionally need to substantially grade and repair the earthen facilities.

1.4 Scope and Methodology

Biologists/Regulatory Specialists from Glenn Lukos Associates, Inc. (GLA) conducted general assessments of the Moreno MDP Project area on January 19 and February 1, 2012. Since access was not available to many of the properties within the study area, the assessments were conducted from the roads and other public rights-of-way, and were not intended to be site-specific for the alignments. As such, this report provides a discussion of existing conditions for the Moreno MDP Project area based on those general assessments; as well as a review of aerial imagery, the California Natural Diversity Database (CNDDDB), the MSHCP documents, and other existing information. Where applicable, this report is consistent with accepted scientific and technical standards and survey guideline requirements issued by the U.S. Fish and Wildlife Service (USFWS), the California Department of Fish and Game (CDFG), the California Native Plant Society (CNPS), and the Western Riverside County MSHCP. This report also discusses the relationship of the MDP to the MSHCP, including future assessments and project-specific studies that will be required in order for individual projects within the MDP study area to be

compliant with the provisions of the MSHCP, including requirements as outlined in *Volume I, Sections 6.1.2, 6.1.3, 6.1.4, and 6.3.2* of the MSHCP document. Finally, this report provides a general assessment of the Moreno MDP Project area for waters of the United States and waters of the State subject to the jurisdictions of (1) the U.S. Army Corps of Engineers (Corps) pursuant to Section 404 of the Clean Water Act; (2) the Regional Water Quality Control Board (Regional Board) pursuant to Section 401 of the Clean Water Act; and (3) CDFG pursuant to Division 2, Chapter 6, Section 1600 of the California Fish and Game Code.

1.5 Existing Conditions

The Moreno MDP Project area drains from north to south/southwest. The majority of the Project area is generally very flat in topography, with the exception of a prominent hill with native scrub vegetation south of SR- 60 and west of Moreno Beach Drive. Nearly all of the proposed MDPF Facilities occur in developed areas, or in existing/former agricultural areas. A smaller number of the proposed MDP Facilities occurs within areas supporting non-native grassland and ruderal vegetation. Many of the proposed MDP Facilities occur within existing paved roads, with others occurring within open fields. Some of the proposed MDP Facilities, specifically the proposed open channels, coincide with existing drainage courses. The majority of the Moreno MDP Project area is disturbed and does not support native habitats.

1.6 Relationship of the Moreno MDP to the MSHCP

1.6.1 MSHCP Background

The Western Riverside County MSHCP is a comprehensive habitat conservation/planning program for Western Riverside County. The intent of the MSHCP is to preserve native vegetation and meet the habitat needs of multiple species, rather than focusing preservation efforts on one species at a time. The MSHCP provides coverage (including take authorization for listed species) for special-status plant and animal species, as well as mitigation for impacts to special-status species and associated native habitats.

Through agreements with the U.S. Fish and Wildlife Service (USFWS) and CDFG, the MSHCP designates 146 special-status animal and plant species as Covered Species, of which the majority have no project-specific survey/conservation requirements. The MSHCP provides mitigation for project-specific impacts to these species for Projects that are compliant/consistent with MSHCP requirements, such that the impacts are reduced to below a level of significance pursuant to CEQA.

The Covered Species that are not yet adequately conserved have additional requirements in order for these species to ultimately be considered “adequately conserved”. A number of these species have survey requirements based on a project’s occurrence within a designated MSHCP survey area and/or based on the presence of suitable habitat. These include Narrow Endemic Plant Species (MSHCP *Volume I, Section 6.1.3*), as identified by the Narrow Endemic Plant Species Survey Areas (NEPSSA); Criteria Area Plant Species (MSHCP *Volume I, Section 6.3.2*) identified by the Criteria Area Plant Species Survey Areas (CAPSSA); animals species (burrowing owl, mammals, amphibians) identified by survey areas (MSHCP *Volume I, Section*

6.3.2); and species associated with riparian/riverine areas and vernal pool habitats, i.e., least Bell's vireo, southwestern willow flycatcher, western yellow-billed cuckoo, and three species of listed fairy shrimp (MSHCP *Volume I, Section 6.1.2*). An additional 28 species (MSHCP *Volume I, Table 9.3*) not yet adequately conserved have species-specific objectives in order for the species to become adequately conserved. However, these species do not have project-specific survey requirements.

The goal of the MSHCP is to have a total Conservation Area in excess of 500,000 acres, including approximately 347,000 acres on existing Public/Quasi-Public (PQP) Lands, and approximately 153,000 acres of Additional Reserve Lands targeted within the MSHCP Criteria Area. The MSHCP is divided into 16 separate Area Plans, each with its own conservation goals and objectives. Within each Area Plan, the Criteria Area is divided into Subunits, and further divided into Criteria Cells and Cell Groups (a group of criteria cells). Each Cell Group and ungrouped, independent Cell has designated "criteria" for the purpose of targeting additional conservation lands for acquisition. Projects meeting the definition of a "Covered Activity" are not required to set aside land pursuant to the Cell Criteria. However, all Projects within the Criteria Area must go through the Joint Project Review (JPR) process, where the Project is reviewed to ensure overall compliance/consistency with the biological requirements of the MSHCP.

1.6.2 Relationship of the Moreno MDP to the MSHCP

The majority of the proposed MDP Facilities occur within the MSHCP burrowing owl survey area, however they do not occur within the NEPSSA, CAPSSA, or amphibian survey areas. A small portion of Line F occurs within the Los Angeles pocket mouse (LAPM) survey area, immediately east of Redlands Boulevard and the proposed Cactus Basin. Within designated MSHCP survey areas, the MSHCP requires habitat assessments, and focused surveys within areas of suitable habitat. For locations with positive survey results, the MSHCP requires that 90 percent of those portions of the property that provide for long-term conservation value for the identified species shall be avoided until it is demonstrated that conservation goals for the particular species have been met throughout the MSHCP. Findings of equivalency shall be made demonstrating that the 90-percent standard has been met, if applicable. If equivalency findings cannot be demonstrated, then "biologically equivalent or superior preservation" must be provided. Section 4.0 of this report discusses each proposed Line and Basin with respect to burrowing owl assessment and survey requirements, and Line F with respect to LAPM requirements.

None of the proposed MDP Facilities occur within the MSHCP Criteria Area. As such, none of these lands are targeted for conservation through the HANS process, though conservation could be required for certain facilities in conjunction with individual species requirements (e.g., burrowing owl) or habitat requirements (riparian/riverine areas). Two proposed Lines (A and J-9) coincide with PQP Lands, though the proposed activities in these areas are not expected to adversely affect conservation values of these lands. Exhibit 4 provides an overlay of all relevant MSHCP surveys areas, etc.

2.0 METHODOLOGY

Glenn Lukos Associates, Inc. (GLA) conducted general biological surveys and habitat assessments of the MDP Project area in order to identify potential impacts to biological resources associated with implementation of the proposed MDP Facilities, and to develop recommendations for the additional studies/analyses. As noted above, the field assessments were conducted from roads and other public right-of-ways, and were not site-specific for many of the alignments. Field assessments were conducted on January 19 and February 1, 2012.

In addition to site reconnaissance, the study included a review of the California Natural Diversity Database (CNDDDB) [CDFG 2012], the California Native Plant Society (CNPS) On-Line Inventory of Rare and Endangered Plants of California (CNPS 2010), MSHCP species and habitat maps, MSHCP sensitive soil maps, Natural Resource Conservation Service's (NRCS) soil data, and other pertinent literature. As could feasibly be detected through the limited observation and review of aerial imagery, GLA identified potential waters of the United States (Corps jurisdiction), waters of the State (CDFG jurisdiction), and MSHCP riparian/riverine areas and vernal pools.

Individual plant and animal species are evaluated in this report based on their "special-status". For the purpose of this report, plants were considered "special-status" based on one or more of the following criteria:

- Listing through the Federal and/or State ESA;
- Occurrence in the CNPS Rare Plant Inventory (List 1B, 2, 3, or 4);
- CNDDDB Global/State Rankings; and/or
- Evaluation and coverage under the MSHCP.

Animals were considered "special-status" based on one or more of the following criteria:

- Listing through the Federal and/or State ESA;
- Designation as a Federal Species of Concern;
- Designation by the State as a California Species of Special Concern (SSC) or California Fully-Protected Species (CFP);
- CNDDDB Global/State Rankings; and/or
- Evaluation and coverage under the MSHCP.

As mentioned above, the majority of the proposed MDP Facilities occur within the MSHCP burrowing owl survey area, however they do not occur within the NEPSSA, CAPSSA, or amphibian survey areas. A small portion of Line F occurs within the Los Angeles pocket mouse (LAPM) survey area, immediately east of Redlands Boulevard and the proposed Cactus Basin.

2.1 Botanical Resources

Botanical resources within the MDP Project area were generally assessed, including the potential for special-status plants to occur within the footprints of the proposed MDP Facilities. Botanical resources were assessed through the review of existing literature, evaluation of general

vegetation types throughout the Project area, and general habitat assessments for special-status plants.

2.1.1 Literature Review

Prior to conducting the field assessments, pertinent literature on the flora of the region was examined. A review was conducted using available literature and other historical records. These resources included, but were not limited to, the following:

- California Native Plant Society *Online Inventory of Rare and Endangered Plants of California* (Eighth Edition) [CNPS 2010];
- California Natural Diversity Database (CNDDDB) for the USGS Sunnymead quadrangle, and other surrounding quadrangle maps (CDFG 2012); and
- MSHCP Document, including *Volume I, Sections 6.1.2, 6.1.3, and 6.3.2* (Riverside County Integrated Project 2003).

2.1.2 Evaluation of Vegetation Types

As was feasible from the roadside analysis and review of aerial imagery, the general vegetation types were noted for the proposed facilities. Exhibit 5 provides a map depicting general vegetation types documented by the MSHCP for the general Moreno Valley area, though the MSHCP mapping is outdated relative to areas that have been developed since the MSHCP baseline data was collected. For example, many areas were mapped as “agriculture” that have since been developed. Exhibit 6 provides representative photographs of the MDP Project area.

2.1.3 Habitat Assessments for Special-Status Plant Species

The proposed MDP Facilities do not occur within the NEPSSA or CAPSSA. As such, habitat assessments (and focused surveys) are not required for plants pursuant to the MSHCP. However, portions of the MDP Project area may have the potential to support special-status plants. Therefore, this report addresses special-status plants in the general context of CEQA. The CNDDDB and MSHCP were initially consulted to determine known occurrences of special-status plants in the region. Other sources used to develop a list of target species for the survey program included the CNPS Online Inventory (CNPS 2010).

2.2 Wildlife Resources

Wildlife resources within the MDP Project area were generally assessed, including the potential for special-status animals to occur within the footprint of proposed facilities. Wildlife resources were evaluated through the review of existing literature and general habitat assessments for special-status animals.

2.2.1 Literature Review

Prior to conducting the field assessments, pertinent literature on the special-status wildlife of the region was examined. A review was conducted using available literature and other historical

records. These resources included, but was not limited to, the following:

- California Natural Diversity Database (CNDDDB) for the USGS Sunnymead quadrangle, and other surrounding quadrangle maps (CDFG 2012); and
- MSHCP Document, including *Volume I, Sections 6.1.2, 6.1.3, and 6.3.2* (Riverside County Integrated Project 2003).

2.2.2 Habitat Assessments for Special-Status Animals

The proposed MDP Facilities were evaluated for the potential to impact special-status animals, although within the MDP Project area the MSHCP requires habitat assessments and focused surveys for only a small number of species. The majority of the proposed MDP Facilities occur within the MSHCP survey area for the western burrowing owl (*Athene cunicularia*), with a very small portion occurring within the survey area for the Los Angeles pocket mouse (*Perognathus longimembris brevinasus*). The MDP study area does not occur within the MSHCP Amphibian Survey Area. The MSHCP also requires habitat assessments for certain species associated with riparian/riverine areas and vernal pools.

Burrowing Owl

The MSHCP requires that burrowing owl habitat assessments be conducted for properties occurring within the Burrowing Owl Survey Area. Habitat assessments are to follow the MSHCP Burrowing Owl Survey Instructions, in order to determine the presence of suitable habitat for the burrowing owl. The Survey Instructions identify burrowing owl habitat as including, but not limited to, native and non-native grassland, interstitial grassland within shrub lands, shrub lands with low density shrub cover, golf-courses, drainage ditches, earthen berms, unpaved airfields, pastureland, dairies, fallow fields, and agricultural use areas. Burrowing owls typically use burrows made by fossorial (adapted for burrowing or digging) mammals, such as ground squirrels or badgers. Burrowing owls often utilize man-made structures, such as earthen berms; cement culverts; asphalt, rock, or wood debris piles; or openings beneath cement or asphalt pavement. Burrowing owls are often found within, under, or in close proximity to man-made structures.

The majority of the proposed MDP Facilities occurs within the MSHCP burrowing owl survey area. However, portions of the designated survey area are now developed, whereas at the time the burrowing owl survey area was designated, these lands consisted of agriculture or some other undeveloped land use. As such, habitat assessments can generally exclude areas that are developed.

Habitat assessments (Step I of the Survey Instructions) must be conducted by walking subject properties, and should consider a 150-meter (500 foot) buffer zone around properties. The Survey Instructions acknowledge that the presence of suitable burrows is not the deciding factor on whether a site contains suitable habitat for burrowing owls. Basic suitability is more broadly defined by the vegetation structure of a given site. Once basic suitability has been confirmed, the presence/absence of suitable burrows is to be determined through focused burrow surveys (Step II, Part A of the Survey Instructions). Focused burrow surveys are to be conducted by walking

through suitable habitat over the entire survey area. Pedestrian survey transects need to be spaced adequately to allow 100% visual coverage of the ground surface.

Since access to the proposed MDP Facilities was limited, general burrowing owl habitat assessments were conducted from roadways and other public rights-of-way, as well as by reviewing aerial imagery. However, focused burrow surveys could not be conducted. The results of general habitat assessment are provided in Section 4.0 of this report for the proposed facilities.

Los Angeles Pocket Mouse

Nearly all of the proposed MDP Facilities do not occur within the MSHCP Mammal Survey Area. However, a small portion of Line F occurs within the Los Angeles pocket mouse (LAPM) survey area prior to its connection with the proposed Cactus Basin (immediately east of Redlands Boulevard). A general habitat assessment was conducted for LAPM within this area.

Species Associated with Riparian Habitat and Vernal Pools

Volume I, Section 6.1.2 of the MSHCP requires habitat assessments and focused surveys for three special-status animals associated with riparian areas, including the least Bell's vireo (*Vireo bellii pusillus*), southwestern willow flycatcher (*Empidonax traillii extimus*), and the western yellow-billed cuckoo (*Coccyzus americanus occidentalis*). In addition, habitat assessments are required for vernal pools and other seasonal ponds to determine if suitable habitat is present for listed fairy shrimp, including the Riverside fairy shrimp (*Streptocephalus woottonii*) and vernal pool fairy shrimp (*Branchinecta lynchi*).

Since habitat assessments were limited to observations from roadways and other public rights-of-way, the ability to assess for the riparian birds and listed fairy shrimp was limited, particularly for listed fairy shrimp. Areas of riparian habitat were noted where it could be detected from roadway observation points, and review of aerial imagery. The detection of local ponding areas is difficult without full access to properties. Furthermore, the assessment of habitat for listed fairy shrimp requires site visits following periods of adequate rainfall.

2.3 MSHCP Riparian/Riverine Areas and Vernal Pools

As referenced above, *Volume I, Section 6.1.2* of the MSHCP describes the process through which the protection of riparian/riverine areas and vernal pools would occur within the MSHCP Plan Area. The purpose is to ensure that the biological functions and values of these areas throughout the MSHCP Plan Area are maintained such that habitat values for species inside the MSHCP Conservation Area are maintained. The MSHCP requires that as projects are proposed within the MSHCP Plan Area, the affect of those projects on riparian/riverine areas and vernal pools must be addressed.

The MSHCP defines riparian/riverine areas as *lands which contain Habitat dominated by trees, shrubs, persistent emergent mosses and lichens, which occur close to or which depend upon soils*

moisture from a nearby fresh water source; or areas with fresh water flow during all or a portion of the year.

The MSHCP defines vernal pools as *seasonal wetlands that occur in depression areas that have wetlands indicators of all three parameters (soils, vegetation, and hydrology) during the wetter portion of the growing season but normally lack wetland indicators of hydrology and/or vegetation during the drier portion of the growing season.*

With the exception of wetlands created for the purpose of providing wetlands Habitat or resulting from human actions to create open waters or from the alteration of natural stream courses, areas demonstrating characteristics as described above which are artificially created are not included in these definitions.

During the field visits, GLA noted drainage features that would be considered as MSHCP riverine areas, including those supporting riparian habitat. However, due to the limited access, the drainage features were only generally described. Additional site-specific mapping would be required to more accurately map and describe riparian/riverine areas within the MDP Project area. Regarding vernal pools, the detection of local ponding areas is difficult without full access to properties. Furthermore, ponding areas cannot be evaluated as vernal pools without direct access to those features.

2.4 Jurisdictional Waters

The MDP Project area was generally evaluated to identify potential jurisdictional waters including those subject to the jurisdictions of (1) the U.S. Army Corps of Engineers (Corps) pursuant to Section 404 of the Clean Water Act; (2) the Regional Water Quality Control Board (Regional Board) pursuant to Section 401 of the Clean Water Act; and (3) the California Department of Fish and Game (CDFG) pursuant to Division 2, Chapter 6, Section 1600 of the Fish and Game Code. The assessment was not considered as a complete jurisdictional delineation, which would require full site access to evaluate and quantify jurisdictional waters. The following is a discussion of the regulatory background for the Corps, Regional Board, and CDFG.

2.4.1 Corps Jurisdiction

Pursuant to Section 404 of the Clean Water Act (CWA), the Corps regulates the discharge of dredged and/or fill material into waters of the United States. The term "waters of the United States" is defined in Corps regulations at 33 CFR Part 328.3(a) as:

- (1) All waters which are currently used, or were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide;*
- (2) All interstate waters including interstate wetlands;*
- (3) All other waters such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, wetlands, sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds, the use, degradation*

or destruction of which could affect foreign commerce including any such waters:

- (i) Which are or could be used by interstate or foreign travelers for recreational or other purposes; or*
 - (ii) From which fish or shell fish are or could be taken and sold in interstate or foreign commerce; or*
 - (iii) Which are used or could be used for industrial purpose by industries in interstate commerce...*
- (4) All impoundments of waters otherwise defined as waters of the United States under the definition;*
 - (5) Tributaries of waters identified in paragraphs (a) (1)-(4) of this section;*
 - (6) The territorial seas;*
 - (7) Wetlands adjacent to waters (other than waters that are themselves wetlands) identified in paragraphs (a) (1)-(6) of this section.*

Waste treatment systems, including treatment ponds or lagoons designed to meet the requirements of CWA (other than cooling ponds as defined in 40 CFR 123.11(m) which also meet the criteria of this definition) are not waters of the United States.

- (8) Waters of the United States do not include prior converted cropland.¹ Notwithstanding the determination of an area's status as prior converted cropland by any other federal agency, for the purposes of the Clean Water Act, the final authority regarding Clean Water Act jurisdiction remains with the EPA.

In the absence of wetlands, the limits of Corps jurisdiction in non-tidal waters, such as intermittent streams, extend to the ordinary high water mark (OHWM) which is defined at 33 CFR 328.3(e) as:

...that line on the shore established by the fluctuation of water and indicated by physical characteristics such as clear, natural line impressed on the bank, shelving, changes in the character of soil, destruction of terrestrial vegetation, the presence of litter and debris, or other appropriate means that consider the characteristics of the surrounding areas.

1. Solid Waste Agency of Northern Cook County v. United States Army Corps of Engineers, et al.

Pursuant to Article I, Section 8 of the U.S. Constitution, federal regulatory authority extends only to activities that affect interstate commerce. In the early 1980s the Corps interpreted the interstate commerce requirement in a manner that restricted Corps jurisdiction on isolated (intrastate) waters. On September 12, 1985, EPA asserted that Corps jurisdiction extended to

¹ The term “prior converted cropland” is defined in the Corps’ Regulatory Guidance Letter 90-7 (dated September 26, 1990) as “wetlands which were both manipulated (drained or otherwise physically altered to remove excess water from the land) and cropped before 23 December 1985, to the extent that they no longer exhibit important wetland values. Specifically, prior converted cropland is inundated for no more than 14 consecutive days during the growing season....” [Emphasis added.]

isolated waters that are used or could be used by migratory birds or endangered species, and the definition of “waters of the United States” in Corps regulations was modified as quoted above from 33 CFR 328.3(a).

On January 9, 2001, the Supreme Court of the United States issued a ruling on *Solid Waste Agency of Northern Cook County v. United States Army Corps of Engineers, et al.* (SWANCC). In this case the Court was asked whether use of an isolated, intrastate pond by migratory birds is a sufficient interstate commerce connection to bring the pond into federal jurisdiction of Section 404 of the Clean Water Act.

The written opinion notes that the court’s previous support of the Corps’ expansion of jurisdiction beyond navigable waters (*United States v. Riverside Bayview Homes, Inc.*) was for a wetland that abutted a navigable water and that the court did not express any opinion on the question of the authority of the Corps to regulate wetlands that are not adjacent to bodies of open water. The current opinion goes on to state:

In order to rule for the respondents here, we would have to hold that the jurisdiction of the Corps extends to ponds that are not adjacent to open water. We conclude that the text of the statute will not allow this.

Therefore, we believe that the court’s opinion goes beyond the migratory bird issue and says that no isolated, intrastate water is subject to the provisions of Section 404(a) of the Clean Water Act (regardless of any interstate commerce connection). However, the Corps and EPA have issued a joint memorandum, which states that they are interpreting the ruling to address only the migratory bird issue and leaving the other interstate commerce clause nexuses intact.

2. Rapanos v. United States and Carabell v. United States

On June 5, 2007, the U.S. Environmental Protection Agency (EPA) and Corps issued joint guidance that addresses the scope of jurisdiction pursuant to the Clean Water Act in light of the Supreme Court’s decision in the consolidated cases *Rapanos v. United States* and *Carabell v. United States* (“Rapanos”). The chart below was provided in the joint EPA/Corps guidance.

For project sites that include waters other than Traditional Navigable Waters (TNWs) and/or their adjacent wetlands or Relatively Permanent Waters (RPWs) tributary to TNWs and/or their adjacent wetlands as set forth in the chart below, the Corps must apply the significant nexus standard, that includes the data set forth in the *Approved Jurisdictional Determination Form*.

For “isolated” waters or wetlands, the joint guidance also requires an evaluation by the Corps and EPA to determine whether other interstate commerce clause nexuses, not addressed in the SWANCC decision are associated with isolated features on project sites for which a jurisdictional determination is being sought from the Corps. The information pertaining to isolated waters is also included on the *Approved Jurisdictional Determination Form*.

The agencies will assert jurisdiction over the following waters:

- Traditional navigable waters

- Wetlands adjacent to traditional navigable waters
- Non-navigable tributaries of traditional navigable waters that are relatively permanent where the tributaries typically flow year-round or have continuous flow at least seasonally (e.g., typically three months)
- Wetlands that directly abut such tributaries

The agencies will decide jurisdiction over the following waters based on a fact-specific analysis to determine whether they have a significant nexus with a traditional navigable water:

- Non-navigable tributaries that are not relatively permanent
- Wetlands adjacent to non-navigable tributaries that are not relatively permanent
- Wetlands adjacent to but that do not directly abut a relatively permanent non-navigable tributary

The agencies generally will not assert jurisdiction over the following features:

- Swales or erosional features (e.g., gullies, small washes characterized by low volume, infrequent or short duration flow)
- Ditches (including roadside ditches) excavated wholly in and draining only uplands and that do not carry a relatively permanent flow of water

The agencies will apply the significant nexus standard as follows:

- A significant nexus analysis will assess the flow characteristics and functions of the tributary itself and the functions performed by all wetlands adjacent to the tributary to determine if they significantly affect the chemical, physical and biological integrity of downstream traditional navigable waters
- Significant nexus includes consideration of hydrologic and ecologic factors

3. Wetland Definition Pursuant to Section 404 of the Clean Water Act

The term “wetlands” (a subset of “waters of the United States”) is defined at 33 CFR 328.3(b) as “those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support...a prevalence of vegetation typically adapted for life in saturated soil conditions.” In 1987 the Corps published a manual to guide its field personnel in determining jurisdictional wetland boundaries. The methodology set forth in the 1987 Wetland Delineation Manual and the Arid West Supplement generally require that, in order to be considered a wetland, the vegetation, soils, and hydrology of an area exhibit at least minimal hydric characteristics. While the manual and Supplement provide great detail in methodology and allow for varying special conditions, a wetland should normally meet each of the following three criteria:

- More than 50 percent of the dominant plant species at the site must be typical of wetlands (i.e., rated as facultative or wetter in the National List of Plant Species that Occur in Wetlands²);

² Reed, P.B., Jr. 1988. National List of Plant Species that Occur in Wetlands. U.S. Fish and Wildlife Service Biological Report 88(26.10).

- Soils must exhibit physical and/or chemical characteristics indicative of permanent or periodic saturation (e.g., a gleyed color, or mottles with a matrix of low chroma indicating a relatively consistent fluctuation between aerobic and anaerobic conditions); and
- Whereas the 1987 Manual requires that hydrologic characteristics indicate that the ground is saturated to within 12 inches of the surface for at least five percent of the growing season during a normal rainfall year, the Arid West Supplement does not include a quantitative criteria with the exception for areas with “problematic hydrophytic vegetation”, which require a minimum of 14 days of ponding to be considered a wetland.

2.4.2 Regional Water Quality Control Board

Subsequent to the SWANCC decision, the Chief Counsel for the State Water Resources Control Board issued a memorandum that addressed the effects of the SWANCC decision on the Section 401 Water Quality Certification Program.³ The memorandum states:

California’s right and duty to evaluate certification requests under section 401 is pendant to (or dependent upon) a valid application for a section 404 permit from the Corps, or another application for a federal license or permit. Thus if the Corps determines that the water body in question is not subject to regulation under the COE’s 404 program, for instance, no application for 401 certification will be required...

The SWANCC decision does not affect the Porter Cologne authorities to regulate discharges to isolated, non-navigable waters of the states....

Water Code section 13260 requires “any person discharging waste, or proposing to discharge waste, within any region that could affect the waters of the state to file a report of discharge (an application for waste discharge requirements).” (Water Code § 13260(a)(1) (emphasis added).) The term “waters of the state” is defined as “any surface water or groundwater, including saline waters, within the boundaries of the state.” (Water Code § 13050(e).) The U.S. Supreme Court’s ruling in SWANCC has no bearing on the Porter-Cologne definition. While all waters of the United States that are within the borders of California are also waters of the state, the converse is not true—waters of the United States is a subset of waters of the state. Thus, since Porter-Cologne was enacted California always had and retains authority to regulate discharges of waste into any waters of the state, regardless of whether the COE has concurrent jurisdiction under section 404. The fact that often Regional Boards opted to regulate discharges to, e.g., vernal pools, through the 401 program in lieu of or in addition to issuing waste discharge requirements (or waivers thereof) does not preclude the regions from issuing WDRs (or waivers of WDRs) in the absence of a request for 401 certification....

³ Wilson, Craig M. January 25, 2001. Memorandum addressed to State Board Members and Regional Board Executive Officers.

In this memorandum the SWRCB's Chief Counsel has made the clear assumption that fill material to be discharged into isolated waters of the United States is to be considered equivalent to "waste" and therefore subject to the authority of the Porter Cologne Water Quality Act. However, while providing a recounting of the Act's definition of waters of the United States, this memorandum fails to also reference the Act's own definition of waste:

"Waste" includes sewage and any and all other waste substances, liquid, solid, gaseous, or radioactive, associated with human habitation, or of human or animal origin, or from any producing, manufacturing, or processing operation, including waste placed within containers of whatever nature prior to, and for purposes of, disposal.

The lack of inclusion of a reference to "fill material," "dirt," "earth" or other similar terms in the Act's definition of "waste," or elsewhere in the Act, suggests that no such association was intended. Thus, the Chief Counsel's memorandum signals that the SWRCB is attempting to retain jurisdiction over discharge of fill material into isolated waters of the United States by administratively expanding the definition of "waste" to include "fill material" without actually seeking amendment of the Act's definition of waste (an amendment would require action by the state legislature). Consequently, discharge of fill material into waters of the State not subject to the jurisdiction of the Corps pursuant to Section 404 of the Clean Water Act may require authorization pursuant to the Porter Cologne Act through application for waste discharge requirements (WDRs) or through waiver of WDRs, despite the lack of a clear regulatory imperative.

2.4.3 California Department of Fish and Game

Pursuant to Division 2, Chapter 6, Sections 1600-1603 of the California Fish and Game Code, the CDFG regulates all diversions, obstructions, or changes to the natural flow or bed, channel, or bank of any river, stream, or lake, which supports fish or wildlife.

CDFG defines a "stream" (including creeks and rivers) as "a body of water that flows at least periodically or intermittently through a bed or channel having banks and supports fish or other aquatic life. This includes watercourses having surface or subsurface flow that supports or has supported riparian vegetation." CDFG's definition of "lake" includes "natural lakes or man-made reservoirs."

CDFG jurisdiction within altered or artificial waterways is based upon the value of those waterways to fish and wildlife. CDFG Legal Advisor has prepared the following opinion:

- Natural waterways that have been subsequently modified and which have the potential to contain fish, aquatic insects and riparian vegetation will be treated like natural waterways...
- Artificial waterways that have acquired the physical attributes of natural stream courses and which have been viewed by the community as natural stream courses, should be treated by [CDFG] as natural waterways...

- Artificial waterways without the attributes of natural waterways should generally not be subject to Fish and Game Code provisions...

Thus, CDFG jurisdictional limits closely mirror those of the Corps. Exceptions are CDFG's exclusion of isolated wetlands (those not associated with a river, stream, or lake), the addition of artificial stock ponds and irrigation ditches constructed on uplands, and the addition of riparian habitat supported by a river, stream, or lake regardless of the riparian area's federal wetland status.

3.0 REGULATORY SETTING

The proposed Project is subject to state and federal regulations associated with a number of regulatory programs. These programs often overlap and were developed to protect natural resources, including: state and federally listed plants and animals; aquatic resources including rivers and creeks, ephemeral streambeds, wetlands, and areas of riparian habitat; other special-status species which are not listed as threatened or endangered by the state or federal governments; and other special-status vegetation communities.

3.1 State and/or Federally Listed Plants or Animals

3.1.1 State of California Endangered Species Act

California's Endangered Species Act (CESA) defines an endangered species as "a native species or subspecies of a bird, mammal, fish, amphibian, reptile, or plant which is in serious danger of becoming extinct throughout all, or a significant portion, of its range due to one or more causes, including loss of habitat, change in habitat, overexploitation, predation, competition, or disease." The State defines a threatened species as "a native species or subspecies of a bird, mammal, fish, amphibian, reptile, or plant that, although not presently threatened with extinction, is likely to become an Endangered species in the foreseeable future in the absence of the special protection and management efforts required by this chapter. Any animal determined by the commission as rare on or before January 1, 1985 is a threatened species." Candidate species are defined as "a native species or subspecies of a bird, mammal, fish, amphibian, reptile, or plant that the commission has formally noticed as being under review by the department for addition to either the list of endangered species or the list of threatened species, or a species for which the commission has published a notice of proposed regulation to add the species to either list." Candidate species may be afforded temporary protection as though they were already listed as threatened or endangered at the discretion of the Fish and Game Commission. Unlike the FESA, CESA does not list invertebrate species.

Article 3, Sections 2080 through 2085, of the CESA addresses the taking of threatened, endangered, or candidate species by stating "No person shall import into this state, export out of this state, or take, possess, purchase, or sell within this state, any species, or any part or product thereof, that the commission determines to be an endangered species or a threatened species, or attempt any of those acts, except as otherwise provided." Under the CESA, "take" is defined as "hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture, or kill."

Exceptions authorized by the state to allow “take” require permits or memoranda of understanding and can be authorized for endangered species, threatened species, or candidate species for scientific, educational, or management purposes and for take incidental to otherwise lawful activities. Sections 1901 and 1913 of the California Fish and Game Code provide that notification is required prior to disturbance.

3.1.2 Federal Endangered Species Act

The Federal Endangered Species Act (FESA) of 1973 defines an endangered species as “any species that is in danger of extinction throughout all or a significant portion of its range.” A threatened species is defined as “any species that is likely to become an Endangered species within the foreseeable future throughout all or a significant portion of its range.” Under provisions of Section 9(a)(1)(B) of the FESA it is unlawful to “take” any listed species. “Take” is defined in Section 3(18) of FESA: “...harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct.” Further, the USFWS, through regulation, has interpreted the terms “harm” and “harass” to include certain types of habitat modification that result in injury to, or death of species as forms of “take.” These interpretations, however, are generally considered and applied on a case-by-case basis and often vary from species to species. In a case where a property owner seeks permission from a Federal agency for an action that could affect a federally listed plant and animal species, the property owner and agency are required to consult with USFWS. Section 9(a)(2)(b) of the FESA addresses the protections afforded to listed plants.

3.1.3 State and Federal Take Authorizations for Listed Species

Federal or state authorizations of impacts to or incidental take of a listed species by a private individual or other private entity would be granted in one of the following ways:

- Section 7 of the FESA stipulates that any federal action that may affect a species listed as threatened or endangered requires a formal consultation with USFWS to ensure that the action is not likely to jeopardize the continued existence of the listed species or result in destruction or adverse modification of designated critical habitat. 16 U.S.C. 1536(a)(2).
- In 1982, the FESA was amended to give private landowners the ability to develop Habitat Conservation Plans (HCP) pursuant to Section 10(a) of the FESA. Upon development of an HCP, the USFWS can issue incidental take permits for listed species where the HCP specifies at minimum, the following: (1) the level of impact that will result from the taking, (2) steps that will minimize and mitigate the impacts, (3) funding necessary to implement the plan, (4) alternative actions to the taking considered by the applicant and the reasons why such alternatives were not chosen, and (5) such other measures that the Secretary of the Interior may require as being necessary or appropriate for the plan .
- Sections 2090-2097 of the California Endangered Species Act (CESA) require that the state lead agency consult with CDFG on projects with potential impacts on state-listed species. These provisions also require CDFG to coordinate consultations with USFWS for actions involving federally listed as well as state-listed species. In certain circumstances, Section 2080.1 of the California Fish and Game Code allows CDFG to

adopt the federal incidental take statement or the 10(a) permit as its own based on its findings that the federal permit adequately protects the species under state law.

3.1.4 Take Authorizations Pursuant to the MSHCP

The Western Riverside County MSHCP was adopted on June 17, 2003, and an Implementing Agreement (IA) was executed between the Federal and State Wildlife Agencies (USFWS and CDFG) and participating entities. The MSHCP is a comprehensive habitat conservation-planning program for western Riverside County. The intent of the MSHCP is to preserve native vegetation and meet the habitat needs of multiple species, rather than focusing preservation efforts on one species at a time. As such, the MSHCP is intended to streamline review of individual projects with respect to the species and habitats addressed in the MSHCP, and to provide for an overall Conservation Area that would be of greater benefit to biological resources than would result from a piecemeal regulatory approach. The MSHCP provides coverage (including take authorization for listed species) for special-status plant and animal species, as well as mitigation for impacts to sensitive species.

Through agreements with the U.S. Fish and Wildlife Service (USFWS) and the California Department of Fish and Game (CDFG), the MSHCP designates 146 special-status animal and plant species that receive some level of coverage under the plan. Of the 146 “Covered Species” designated under the MSHCP, the majority of these species have no additional survey/conservation requirements. In addition, through project participation with the MSHCP, the MSHCP provides mitigation for project-specific impacts to Covered Species so that the impacts would be reduced to below a level of significance pursuant to CEQA. As noted above, project-specific survey requirements exist for species designated as “Covered Species not yet adequately conserved”. These include Narrow Endemic Plant Species, as identified by the Narrow Endemic Plant Species Survey Areas (NEPSSA); Criteria Area Plant Species identified by the Criteria Area Species Survey Areas (CASSA); animals species as identified by survey area; and plant and animal species associated with riparian/riverine areas and vernal pool habitats (*Volume I, Section 6.1.2* of the MSHCP document).

3.2 California Environmental Quality Act

3.2.1 CEQA Guidelines Section 15380

CEQA requires evaluation of a project’s impacts on biological resources and provides guidelines and thresholds for use by lead agencies for evaluating the significance of proposed impacts. Sections 5.1.1 and 5.2.2 below set forth these thresholds and guidelines. Furthermore, pursuant to the CEQA Guidelines Section 15380, CEQA provides protection for non-listed species that could potentially meet the criteria for state listing. For plants, CDFG recognizes that plants on Lists 1A, 1B, or 2 of the California Native Plant Society (CNPS) *Inventory of Rare and Endangered Plants in California* may meet the criteria for listing and should be considered under CEQA. CDFG also recommends protection of plants, which are regionally important, such as locally rare species, disjunct populations of more common plants, or plants on the CNPS Lists 3 or 4.

3.2.2 Special-Status Plants and Animals Evaluated Under CEQA

Federally Designated Special-Status Species

Within recent years, the USFWS instituted changes in the listing status of candidate species. Former C1 (candidate) species are now referred to simply as candidate species and represent the only candidates for listing. Former C2 species (for which the USFWS had insufficient evidence to warrant listing) and C3 species (either extinct, no longer a valid taxon or more abundant than was formerly believed) are no longer considered as candidate species. Therefore, these species are no longer maintained in list form by the USFWS, nor are they formally protected. However, some USFWS field offices have issued memoranda stating that former C2 species are to be considered federal Species of Concern (FSC). This term is employed in this document, but carries no official protections. All references to federally-protected species in this report (whether listed, proposed for listing, or candidate) include the most current published status or candidate category to which each species has been assigned by USFWS.

For this report the following acronyms are used for federal special-status species:

- FE Federally listed as Endangered
- FT Federally listed as Threatened
- FPE Federally proposed for listing as Endangered
- FPT Federally proposed for listing as Threatened
- FC Federal candidate species (former C1 species)
- FSC Federal Species of Concern (former C2 species)

State-Designated Special-Status Species

Some mammals and birds are protected by the state as Fully Protected (CFP) Mammals or Fully Protected Birds, as described in the California Fish and Game Code, Sections 4700 and 3511, respectively. California Species of Special Concern (SSC) are species designated as vulnerable to extinction due to declining population levels, limited ranges, and/or continuing threats. This list is primarily a working document for the CDFG's CNDDDB project. Informally listed taxa are not protected, but warrant consideration in the preparation of biotic assessments. For some species, the CNDDDB is only concerned with specific portions of the life history, such as roosts, rookeries, or nest sites.

For this report the following acronyms are used for State special-status species:

- SE State-listed as Endangered
- ST State-listed as Threatened
- SR State-listed as Rare
- SCE State candidate for listing as Endangered
- SCT State candidate for listing as Threatened
- CFP California Fully-Protected
- CP California Protected
- SSC California Species of Special Concern

California Native Plant Society

The CNPS is a private plant conservation organization dedicated to the monitoring and protection of sensitive species in California. The California Native Plant Society's Sixth Edition of the *California Native Plant Society's Inventory of Rare and Endangered Plants of California* separates plants of interest into five categories. CNPS has compiled an inventory comprised of the information focusing on geographic distribution and qualitative characterization of Rare, Threatened, or Endangered vascular plant species of California (Tibor 2001). CNPS maintains an updated Online Inventory. The 8th Edition of the Online Inventory was released in December 2010. The Inventory serves as the candidate list for listing as threatened and endangered by CDFG.

CNPS has developed five categories of rarity that are summarized in Table 3-1.

Table 3-1. CNPS Lists

CNPS List	Comments
List 1A – Presumed Extinct in California	Thought to be extinct in California based on a lack of observation or detection for many years.
List 1B – Rare or Endangered in California and Elsewhere	Species, which are generally rare throughout their range that are also judged to be vulnerable to other threats such as declining habitat.
List 2 - Rare or Endangered in California, More Common Elsewhere	Species that are rare in California but more common outside of California
List 3 – Need More Information	Species that are thought to be rare or in decline but CNPS lacks the information needed to assign to the appropriate list. In most instances, the extent of surveys for these species is not sufficient to allow CNPS to accurately assess whether these species should be assigned to a specific list. In addition, many of the List 3 species have associated taxonomic problems such that the validity of their current taxonomy is unclear.
List 4 – Plants of Limited Distribution	Species that are currently thought to be limited in distribution or range whose vulnerability or susceptibility to threat is currently low. In some cases, as noted above for List 3 species above, CNPS lacks survey data to accurately determine status in California. Many species have been placed on List 4 in previous editions of the “Inventory” and have been removed as survey data has indicated that the species are more common than previously thought. CNPS recommends that species currently included on this list should be monitored to ensure that future substantial declines are minimized.
<i>Extension Code</i>	<i>Comment</i>
.1 – Seriously endangered in California	Species with over 80% of occurrences threatened and/or have a high degree and immediacy of threat.
.2 – Fairly endangered in California	Species with 20-80% of occurrences threatened.
.3 – Not very endangered in California	Species with <20% of occurrences threatened or with no current threats known.

4.0 RESULTS

This section discusses the results of general assessments conducted for the MDP Project area, including vegetation, special-status plants and animals, MSHCP riparian/riverine areas and vernal pools, and jurisdictional waters.

4.1 Vegetation Types/Land Uses

The MSHCP identifies five general vegetation types within the overall MDP Project area, including Field Croplands (Agriculture), Grove/Orchard (Agriculture), Residential/Urban/Exotic (Disturbed/Developed), Non-Native Grassland (Grassland), Riversidean Sage Scrub (Scrub), Oak Woodland (Woodland or Forest), Riparian Scrub (Wetlands), and Disturbed Alluvial (Scrub). Nearly all of the proposed facilities coincide with the Field Cropland or Residential/Urban Exotic vegetation associations. Table 4-1 below summarizes the MSHCP vegetation mapping for each vegetation type, followed by MSHCP descriptions of each vegetation type.

4-1. Summary of MSHCP Vegetation Mapping for the MDP Project Area.

Vegetation Type	Proposed MDP Facilities
Field Croplands	A-1 through A-6 B, B-1 through B-4 C D-1, D-2, D-3, D5, D-7, D-8 E-1, E-3 through E-10 F, F-2, F-13, F-15, F-16, F-17 G, G-1 through G-4, G-7 through G-11 H, H-1 & H-1a, H-2 through H-6 J, J-1, J-7, J-8, J-9 K, K-1, K-2 Quincy Basin, Redlands Basin, Sinclair Basin, Cactus Basin
Grove/Orchard	F-2, G, H-2, J-9
Residential/Urban/Exotic	A, A-1, A-2, A-6, A-7 B-1, B-2, B-4 D-1 through D-5, D-7, D-8 E-3, E-6, E-7, E-9, E-10 F, F-2, F-15, F-16, F-17 G, G-2, G-3, G-7, G-9, G-10 H, H-1 & H-1a, H-2, H-3, H-5 & H-5a J, J-1, J-7, J-9 K, K-1, K-4
Non-Native Grassland	A-1 E-8 F, F-2 G, G-7

Vegetation Type	Proposed MDP Facilities
	J K, K-1 Reche Canyon Basins, Nason Bason, Ironwood Basin
Riversidean Sage Scrub	A, A-1, C, K
Oak Woodland	B
Riparian Scrub	A-1, A-4
Disturbed Alluvial Scrub	F

4.1.1 Field Croplands

A majority of the proposed MDP Facilities are associated with areas mapped by the MSHCP as Field Croplands, which is organized under the general category of Agriculture. However, some areas originally designated as Field Croplands (and other Agriculture categories) have since been developed. Furthermore, many of proposed facilities occurring within areas mapped as Field Croplands would be constructed within existing paved roads, although the roads are not specifically separated out in the MSHCP mapping. For example, Line J-9 is a storm drain proposed along Cactus Avenue, though that portion of Cactus Avenue is lumped into an area mapped as Field Croplands and Grove/Orchard.

Field croplands occur extensively throughout the MSHCP Plan Area. Ecologically, many annual crop species are self-fertile or set seeds apomictically, i.e., without sexual reproduction (Holland and Keil 1995). Seeds are also disseminated by machinery and some species may have seeds which can lay dormant in a seed bank (Holland and Keil 1995). Some weedy species common to croplands exclude growth of nearby plants; e.g., wild oat (*Avena fatua*) produces allelopathic chemicals and sow-thistles (*Sonchus* spp.) develop a basal rosette which shades out other seedling plants (Holland and Keil 1995). For these reasons, within a few years of converting a natural habitat area to cropland, native plants are effectively eliminated (Holland and Keil 1995). Native perennials are especially susceptible to disturbance (Holland and Keil 1995). Abandoned crop lands seldom re-establish dense native plant communities and often native species are absent (Holland and Keil 1995).

All or portions of the following proposed MDP Facilities are designated as Field Croplands: A-1 through A-6, B, B1 through B4, C, D-1, D-2, D-3, D5, D-7, D-8, E-1, E-3 through E-10, F, F-2, F-13, F-15, F-16, F-17, G, G-1 through G-4, G-7 through G-11, H, H-1 and H-1a, H-2 through H-6, J, J-1, J7, J8, J9, K, K-1, K-2, Quincy Basin, Redlands Basin, Sinclair Basin, and Cactus Basin.

Field Croplands have the potential to support special-status species, although due to the level of disturbance, the number of potential species is limited. The species with the highest potential to occur throughout the agricultural areas is the burrowing owl. Additional special-status animals with the potential for occurrence include, but are not limited to, Stephens' kangaroo rat (*Dipodomys stephensi*), northwestern San Diego pocket mouse (*Chaetodipus fallax fallax*), San Diego black-tailed jackrabbit (*Lepus californicus bennettii*), and California horned lark

(*Eremophila alpestris actia*). The Field Croplands offer extensive foraging opportunities for numerous raptors, including special-status raptors.

4.1.2 Grove/Orchard

The MSHCP designation of Grove/Orchard is based on grove and orchard farms that are registered with the County and State, and information regarding land use stored with the County by parcel. As such, the baseline mapping of this vegetation type is considered by the MSHCP to be very accurate. However, as with the conversion of Field Croplands to development, areas previously designated as Grove/Orchard may have since been developed. Furthermore, many of proposed facilities occurring within areas mapped as Field Croplands would be constructed within existing paved roads, although the roads are not specifically separated out in the MSHCP mapping. For example, Line J-9 is a storm drain proposed along Cactus Avenue, though that portion of Cactus Avenue is lumped into an area mapped as Field Croplands and Grove/Orchard. Portions of the following proposed MPD facilities are designated as Grove/Orchard by the MSHCP: F-2, G, H-2, and J-9.

Groves and orchards have a limited potential to support special-status species. Depending on the types of trees, groves/orchards in general provide nesting/roosting opportunities for raptors and other birds, and roosting/foraging opportunities for bats.

4.1.3 Residential/Urban/Exotic

Besides Field Croplands, the second largest MSHCP mapping designation associated with the proposed MDP Facilities is Residential/Urban/Exotic. There is a variety of ways to classify vegetation within urbanized areas. One method is presented here along with a discussion of weed communities. Besides the inclusion of urban developed areas, this category also includes rural residential lots where native communities have been disturbed and replaced with weedy vegetation, and exotic trees and shrubs that were planted or that escaped from landscaped areas. The Residential/Urban/Exotic category also includes parks, green belts, golf courses, cemeteries, and other landscaped/maintained areas. Weedy vegetation areas are also associated with roadsides and abandoned areas. In larger areas, these weed populations may represent the early stages of natural succession (Holland and Keil 1995). Some of these areas are known as ruderal communities. A ruderal community occupies waste areas and roadsides, often on heavily compacted soils with little available oxygen (Holland and Keil 1995). Typical species include pineapple-weed (*Chamomilla suaveolens*), common knotweed (*Polygonum arenastrum*), sow-thistle (*Sonchus oleraceus*), horseweed (*Conyza canadensis*), and goosefoot (*Chenopodium* spp.).

All or portions of the following proposed MDP Facilities are designated as Rural/Urban/Exotic by the MSHCP: A, A-1, A-2, A-6, A-7, B, B-2, B-4, D-1 through D-5, D-7, D-8, E-3, E-6, E-7, E-9, F, F-2, F-15, F-16, F-17, G, G-2, G-3, G-7, G-9, H, H-2, H-3, H-5 & H-5a, J, J-1, J-7, K, K-1, and K-4. As noted above, some areas originally mapped as an agricultural category have since been developed, and would now be classified as Rural/Urban/Exotic. Other proposed facilities are to occur within existing paved or dirt roads that are bordered on both sides by agricultural

categories. This includes portions of the following proposed facilities: B-1, E-10, G-10, H-1 & H-1a, J-9.

The proposed MDP Facilities within existing developed areas are not expected to support special-status species due to a lack of suitable habitat.

4.1.4 Non-Native Grassland

Portions of several proposed MDP Facilities are associated with areas mapped by the MSHCP as non-native grassland. This includes the following facilities: A-1, E-8, F, F-2, G, G-7, J, K, K-1, Reche Canyon Basins, Nason Basin, and Ironwood Basin. Non-native grasslands, which comprise 98% of all grasslands within the overall MSHCP Plan Area, are spread throughout Western Riverside County.

Non-native grasslands primarily are composed of annual grass species introduced from the Mediterranean basin and other mediterranean-climate regions with variable presence of non-native and native herbaceous species (Baker 1989; Mack 1989). Species composition of non-native grasslands may vary over time and place based on grazing or fire regimes, soil disturbance, and annual precipitation patterns (McNaughton 1968; Heady 1977; Keeley 1989). Non-native grasslands are likely to be dominated by several species of grasses, including slender oat (*Avena barbata*), wild oat (*A. fatua*), fox tail chess (*Bromus madritensis* ssp. *rubens*), soft chess (*B. hordeaceus*), ripgut grass (*B. diandrus*), barley (*Hordeum* spp.), rye grass (*Lolium multiflorum*), English ryegrass (*L. perrene*), rat-tail fescue (*Vulpia myuros*), and Mediterranean schismus (*Schismus barbatus*). Non-native grasslands also typically support an array of annual non-native forbs, such as red-stemmed filaree (*Erodium cicutarium*), broad-loabed filaree (*E. botrys*), mustard (*Brassica* spp.), short-podded mustard (*Hirschfeldia incana*), tocalote (*Centaurea melitensis*), and Italian thistle (*Carduus pycnocephalus*) [Keeley 1989; pers. obs.]. Low abundances of native species are sometimes present within non-native grasslands, including a small percentage of native shrubs, particularly in areas that transition into sage scrub and chaparral habitats. These species usually include disturbance specialists with several different growth forms: subshrubs (e.g., *Lotus* spp., *Eriogonum* spp., *Lessingia* spp, *Isocoma*, spp., *Ericameria* spp.); succulents (*Opuntia* spp.); perennial geophytes (e.g., *Dichelostemma capitata*); and herbaceous annuals (e.g., doveweed (*Croton setiger*), vinegar weed (*Trichostemma lanceolatum*), and tarweed (*Hemizonia* spp). (Holland 1986; Sawyer and Keeler-Wolf 1995; Keeley 1989).

The non-native grasslands within the MDP Project area have the potential to support special-status species similar to those that may be associated with the Field Croplands, including burrowing owl, Stephens' kangaroo rat, northwestern San Diego pocket mouse, and San Diego black-tailed jackrabbit. The lesser-disturbed grassland areas adjacent to scrub habitats also have some potential to support special-status reptiles such as coast horned lizard (*Phrynosoma blainvillii*), coastal whiptail (*Aspidoscelis tigris stejnegeri*), orangethroat whiptail (*Aspidoscelis hyperythra*), and red-diamond rattlesnake (*Crotalus ruber*). The non-native grasslands also offer foraging opportunities for numerous raptors, including special-status raptors.

4.1.5 Riversidean Sage Scrub

Portions of several proposed MDP Facilities are associated with a few small habitat patches mapped by the MSHCP as Riversidean sage scrub. This includes the following facilities: A, A-1, C, and K. Coastal sage scrub is represented by several major associations that occur discontinuously from the San Francisco Bay area south to El Rosario in Baja California, Mexico. Some classification systems are based on dominant species (*e.g.*, Holland 1986; Sawyer and Keeler-Wolf; White and Padley 1997), while others are based on geographic location (*e.g.*, Axelrod 1978; Westman 1982). Three subassociations of coastal sage scrub occur within Western Riverside County: Diegan coastal sage, Riversidean sage scrub and coastal scrub.

Coastal sage scrub is dominated by a characteristic suite of low-statured, aromatic, drought-deciduous shrubs and subshrub species. Composition varies substantially depending on physical circumstances and the successional status of the habitat, however, characteristic species include California sagebrush (*Artemisia californica*), California buckwheat (*Eriogonum fasciculatum*), laurel sumac (*Malosma laurina*), California encelia (*Encelia californica*), and several species of sage (*e.g.*, *Salvia mellifera*, *S. apiana*) (Holland 1986; Sawyer and Keeler-Wolf 1995). Other common species include brittlebush (*Encelia farinosa*), lemonadeberry (*Rhus integrifolia*), sugarbush (*Rhus ovata*), yellow bush penstemon (*Keckiella antirrhinoides*), Mexican elderberry (*Sambucus mexicana*), sweetbush (*Bebbia juncea*), boxthorn (*Lycium* spp.), shore cactus (*Opuntia littoralis*), coastal cholla (*O. prolifer*), tall prickly-pear (*Opuntia oricola*), and species of *Dudleya*.

According to Westman (1982), all coastal sage scrub in Riverside County is contained in the Riversidean subassociation, however, a relatively recent classification of sage scrub in Western Riverside County (White and Padley 1997) has identified seven subassociations (or series) based upon dominant shrub cover. These series include California sagebrush, California buckwheat, California sagebrush-California buckwheat, California sagebrush-white sage, brittlebush, black sage, and deerweed.

The proposed MDP Facilities will have very minimal impact on Riversidean sage scrub vegetation. Special-status species potentially associated with the above-referenced alignments would be similar to those potentially associated with the adjacent non-native grasslands, including burrowing owl, Stephens' kangaroo rat, northwestern San Diego pocket mouse, San Diego black-tailed jackrabbit, coast horned lizard, coastal whiptail, orangethroat whiptail, and red-diamond rattlesnake. Several special-status plant species also may have some potential to occur within the sage scrub habitats, as discussed below.

4.1.6 Oak Woodland

The MSHCP vegetation mapping identifies an area of oak woodland occurring northeast of Highland Boulevard, in the northeast portion of the MDP Project area. The mapped portion includes three trees northeast of Highland Boulevard and one tree southwest of the road. Proposed Line B would be constructed within the existing road, and is not expected result in impacts to any native trees.

4.1.7 Riparian Scrub

The MSHCP vegetation mapping identifies riparian scrub habitat in association with a drainage feature corresponding to the following proposed facilities: A-1 and A-4. However, the extent of riparian habitat is inadequately mapped within the MDP Project area. Riparian vegetation is associated with other drainage features within the Project area, including existing drainages associated with the following proposed facilities: F, G, and K. The full extent of riparian habitat within the MDP Project area must be determined through project-specific studies. A more-detailed discussion of riparian habitat in the context of jurisdictional waters and MSHCP Riparian/Riverine areas is provided below.

The MSHCP recognizes a number of different riparian categories, including riparian forest, riparian scrub, southern willow scrub, mule fat scrub, southern cottonwood/willow riparian, and southern sycamore/alder riparian. Other riparian categories are represented by a substantial component of invasive species, including giant reed (*Arundo donax*) and tamarisk (*Tamarix* spp.). Several of these categories appear to be represented within the Project area, including some within the existing channel associated with the lowermost portion of proposed Line F. The drainage feature associated with proposed Line K contains a substantial amount of giant reed.

Special-status species have a potential to occur within some of the riparian habitats within the Project area, particularly with the riparian channel associated with the lowermost portion of Line F. Depending on the vegetation structure of the habitat, potential species include the federally and state listed least Bell's vireo (*Vireo bellii pusillus*), as well as non-listed birds such as the yellow warbler (*Setophaga petechia*). The listed southwestern willow flycatcher (*Empidonax traillii extimus*), and western yellow-billed cuckoo (*Coccyzus americanus occidentalis*) is not expected to occur due to a lack of suitable habitat.

4.1.8 Disturbed Alluvial Scrub

A portion of the Line K, immediately west (downstream) of Oliver Street is mapped by the MSHCP as disturbed alluvial scrub. Alluvial scrub is a Mediterranean shrubland type that occurs in washes and on gently sloping alluvial fans. Alluvial scrub is made up predominantly of drought-deciduous soft-leaved shrubs, but with significant cover of larger perennial species typically found in chaparral (Kirkpatrick and Hutchinson 1977). This vegetation type is distinctive because of the co-occurrence of evergreen shrubs, drought-deciduous shrubs, riparian species, and upland annual species in close proximity to one another (Hanes *et al.* 1989). Because alluvial scrub is physiognomically intermediate between chaparral and coastal sage scrub, it shares many of the same species. The only dominant species that has a strong fidelity to alluvial scrub is scalebroom (*Lepidospartum squamatum*) (Smith 1980). Scalebroom generally is regarded as an indicator of Riversidian alluvial scrub (Smith 1980; Hanes *et al.* 1989). The drainage located west (and east) of Oliver Street consists of a very disturbed alluvial feature, and is not typical of Riverisidean alluvial fan sage scrub that is more well represented in other parts of Western Riverside County such as portions of the Santa Ana River, San Jacinto River, and Temescal Canyon Wash.

4.2 Special-Status Plants

Special-status plants are not expected to occur within the majority of proposed MDP Facilities due to a lack of suitable habitat. At least several special-status plants have a potential to occur within the overall MDP Project area, however none would have any MSHCP survey/conservation requirements applicable to the Project, since the Project area does not occur within the NEPSSA or CAPSSA.

Table 4-2 provides a list of special-status plants evaluated for the MDP Project. Plant species were considered based on a number of factors, including: 1) species identified by the CNDDDB as occurring (either currently or historically) on or in the vicinity of the Project Site, and 2) any other special-status plants that are known to occur within the vicinity of the Project area, or for which potentially suitable habitat occurs on site.

Table 4-2. Special-Status Plants Evaluated for the MDP Project Area.

Species Name	Status	Habitat Requirements	Potential to Occur On Site
Chaparral sand verbena <i>Abronia villosa</i> var. <i>aurita</i>	Federal: None State: None CNPS: List 1B.1	Sandy soils in chaparral, coastal sage scrub.	Low potential to occur within the Project area.
Coulter's goldfields <i>Lasthenia glabrata</i> ssp. <i>coulteri</i>	Federal: None State: None CNPS: List 1B.1	Playas, vernal pools, marshes and swamps (coastal salt).	Not expected to occur within the Project area due to a lack of suitable habitat.
Davidson's saltscale <i>Atriplex serenana</i> var. <i>davidsonii</i>	Federal: None State: None CNPS: List 1B	Alkaline soils in coastal sage scrub, coastal bluff scrub.	Not expected to occur within the Project area due to a lack of suitable habitat.
Long-spined spineflower <i>Chorizanthe polygonoides</i> var. <i>longispina</i>	Federal: None State: None CNPS: List 1B.2	Clay soils in chaparral, coastal sage scrub, meadows and seeps, and valley and foothill grasslands	Low potential to occur within the Project area.
Mesa horkelia <i>Horkelia cuneata</i> ssp. <i>puberula</i>	Federal: None State: None CNPS: List 1B.1	Sandy or gravelly soils in chaparral (maritime), cismontane woodland, and coastal scrub.	Not expected to occur within the Project area due to a lack of suitable habitat.
Mud nama <i>Nama stenocarpum</i>	Federal: None State: None CNPS: List 2	Marshes and swamps	Not expected to occur within the Project area due to a lack of suitable habitat.
Palmer's grapplinghook <i>Harpagonella palmeri</i>	Federal: None State: None CNPS: List 4.2	Chaparral, coastal sage scrub, valley and foothill grassland. Occurring in clay soils.	Low potential to occur within the Project area.
Parish's brittlescale <i>Atriplex parishii</i>	Federal: None State: None CNPS: List 1B	Chenopod scrub, playas, vernal pools.	Not expected to occur within the Project area due to a lack of suitable habitat.
Parish's desert-thorn <i>Lycium parishii</i>	Federal: None State: None	Coastal sage scrub, Sonoran desert scrub	Not expected to occur within the Project area due

Species Name	Status	Habitat Requirements	Potential to Occur On Site
	CNPS: List 2.3		to a lack of suitable habitat.
Parry's spineflower <i>Chorizanthe parryi</i> var. <i>parryi</i>	Federal: None State: None CNPS: List 1B.1	Sandy or rocky soils in open habitats of chaparral and coastal sage scrub.	Low potential to occur within the Project area.
Payson's jewelflower <i>Caulanthus simulans</i>	Federal: None State: None CNPS: List 4.2	Sandy or granitic soils in chaparral and coastal scrub.	Low potential to occur within the Project area.
Plummer's mariposa lily <i>Calochortus plummerae</i>	Federal: None State: None CNPS: List 1B.2	Granitic, rock soils within chaparral, cismontane woodland, coastal sage scrub, lower montane coniferous forest, valley and foothill grassland.	Low potential to occur within the Project area.
Robinson's pepper grass <i>Lepidium virginicum</i> var. <i>robinsonii</i>	Federal: None State: None CNPS: List 1B.2	Chaparral, coastal sage scrub	Low potential to occur within the Project area.
San Bernardino aster <i>Symphyotrichum defoliatum</i>	Federal: None State: None CNPS: List 1B.2	Cismontane woodland, coastal scrub, lower montane coniferous forest, meadows and seeps, marshes and swamps, valley and foothill grassland (vernally mesic).	Not expected to occur within the Project area due to a lack of suitable habitat.
San Diego ambrosia <i>Ambrosia pumila</i>	Federal: FE State: None CNPS: List 1B.1	Chaparral, coastal sage scrub, valley and foothill grassland, vernal pools. Often in disturbed habitats.	Not expected to occur within the Project area due to a lack of suitable habitat.
Santa Ana River woolly star <i>Eriastrum densifolium</i> ssp. <i>sanctorum</i>	Federal: FE State: SE CNPS: List 1B.1	Alluvial fan sage scrub, chaparral. Occurring on sandy or rocky soils.	Not expected to occur within the Project area due to a lack of suitable habitat.
Slender-horned spineflower <i>Dodecahema leptoceras</i>	Federal: FE State: SE CNPS: List 1B.1	Sandy soils in alluvial scrub, chaparral, cismontane woodland.	Not expected to occur within the Project area due to a lack of suitable habitat.
Smooth tarplant <i>Centromadia pungens</i> ssp. <i>laevis</i>	Federal: None State: None CNPS: List 1B.1	Alkaline soils in chenopod scrub, meadows and seeps, playas, riparian woodland, valley and foothill grasslands, disturbed habitats.	Low potential to occur within the Project area.
Spreading navarretia <i>Navarretia fossalis</i>	Federal: FT State: None CNPS: List 1B	Vernal pools, playas, chenopod scrub, marshes and swamps (assorted shallow freshwater).	Not expected to occur within the Project area due to a lack of suitable habitat.
Thread-leaved brodiaea <i>Brodiaea filifolia</i>	Federal: FT State: SE CNPS: List 1B.1	Clay soils in chaparral (openings), cismontane woodland, coastal sage scrub, playas, valley	Not expected to occur within the Project area due to a lack of suitable habitat.

Species Name	Status	Habitat Requirements	Potential to Occur On Site
		and foothill grassland, vernal pools.	
<p>Federal FE – Federally Endangered FT – Federally Threatened</p> <p>State SE – State Endangered ST – State Threatened</p> <p>CNPS List 1B – Plants rare, threatened, or endangered in California and elsewhere. List 2 – Plants rare, threatened, or endangered in California, but more common elsewhere. List 3 – Plants about which more information is needed. List 4 – Plants of limited distribution (a watch list).</p> <p>CNPS Threat Code Extensions .1 – Seriously endangered in California (over 80% of occurrences threatened/high degree and immediacy of threat) .2 – Fairly endangered in California (20-80% occurrences threatened) .3 – Not very endangered in California (<20% of occurrences threatened or no current threats known)</p>			

4.3 Special-Status Animals

A number of special-status animals have the potential to occur within the MDP Project area. These include, but are not limited to the western burrowing owl, Stephens’ kangaroo rat (SKR), northwestern San Diego pocket mouse, San Diego black-tailed jackrabbit, California horned lark, coast horned lizard, coastal whiptail, orangethroat whiptail, red-diamond rattlesnake, and numerous raptor species.

Table 4-3 provides a list of special-status animals evaluated for the Project area, including MSHCP Covered Species with additional survey requirements. Species were evaluated based on a number of factors, including: 1) species identified by the CNDDDB as occurring (either currently or historically) on or in the vicinity of the Project Site, and 2) any other special-status plants that are known to occur within the vicinity of the Project area, or for which potentially suitable habitat occurs on site.

Table 4-3. Special-Status Animals Evaluated for the MDP Project Area.

Species Name	Status	Habitat Requirements	Potential for Occurrence
Invertebrates			
Riverside fairy shrimp <i>Streptocephalus woottoni</i>	Federal: FE State: None	Restricted to deep seasonal vernal pools, vernal pool-like ephemeral ponds, and stock ponds.	Not expected to occur within the MDP Facilities due to a lack of suitable habitat.
Vernal pool fairy shrimp <i>Branchinecta lynchi</i>	Federal: FT State: None	Seasonal vernal pools	Not expected to occur within the MDP Facilities due to a lack of suitable habitat.
Amphibians			
Western spadefoot <i>Scaphiopus hammondi</i>	Federal: None State: None CDFG: SSC	Seasonal pools in coastal sage scrub, chaparral, and grassland habitats.	Not expected to occur within the MDP Facilities due to a lack of suitable habitat.
Reptiles			
Coast horned lizard <i>Phrynosoma blainvillii</i>	Federal: None State: None CDFG: SSC	Occurs in a variety of vegetation types including coastal sage scrub, chaparral, annual grassland, oak woodland, and riparian woodlands.	Low potential for occurrence within portions of the MDP Facilities.
Coastal whiptail <i>Aspidoscelis tigris</i>	Federal: None State: None	Open, often rocky areas with little vegetation, or sunny microhabitats within shrub or grassland associations.	Low potential for occurrence within portions of the MDP Facilities.
Orangethroat whiptail <i>Aspidoscelis hyperythra</i>	Federal: None State: None CDFG: SSC	Coastal sage scrub, chaparral, non-native grassland, oak woodland, and juniper woodland.	Low potential for occurrence within portions of the MDP Facilities.
Red-diamond rattlesnake <i>Crotalus exsul</i>	Federal: None State: Nond CDFG: SSC	Habitats with heavy brush and rock outcrops, including coastal sage scrub and chaparral.	Low potential for occurrence within portions of the MDP Facilities.
Birds			
Bell's sage sparrow <i>Amphispiza belli belli</i>	Federal: FSC State: None CDFG: SSC	Chaparral and coastal sage scrub along the coastal lowlands, inland valleys, and in the lower foothills of local mountains.	Not expected to occur within the MDP Facilities due to a lack of suitable habitat.

Species Name	Status	Habitat Requirements	Potential for Occurrence
Burrowing owl <i>Athene cunicularia</i>	Federal: None State: None CDFG: SSC	Shortgrass prairies, grasslands, lowland scrub, agricultural lands (particularly rangelands), coastal dunes, desert floors, and some artificial, open areas as a year-long resident. Occupies abandoned ground squirrel burrows as well as artificial structures such as culverts and underpasses.	Moderate to high potential for occurrence within portions of the MDP Facilities.
California horned lark <i>Eremophila alpestris actia</i>	Federal: None State: None	Occupies a variety of open habitats, usually where trees and large shrubs are absent.	Moderate to high potential for occurrence within portions of the MDP Facilities.
Coastal California gnatcatcher <i>Polioptila californica californica</i>	Federal: FT State: None CDFG: SSC	Low elevation coastal sage scrub and coastal bluff scrub.	Not expected to occur within the MDP Facilities due to a lack of suitable habitat.
Cooper's hawk (Nesting) <i>Accipiter cooperi</i>	Federal: None State: None	Primarily occurs in riparian areas and oak woodlands, most commonly in montane canyons. Known to use urban areas, occupying trees among residential and commercial.	Moderate to high potential for occurrence within the MDP Project area for foraging, though not expected to nest within the footprint of the MDP Project facilities.
Ferruginous hawk (wintering) <i>Buteo regalis</i>	Federal: FSC State: None CDFG: SSC	Open, dry country, perching on trees, posts, and mounds. In California, wintering habitat consists of open terrain and grasslands of the plains and foothills.	Moderate to high potential for occurrence within the MDP Project area for winter foraging. Does not nest in California.
Golden eagle <i>Aquila chrysaetos</i>	Federal: None State: None CDFG: SSC	In southern California, occupies grasslands, brushlands, deserts, oak savannas, open coniferous forests, and montane valleys. Nests on rock outcrops and ledges.	Low potential for occurrence within the MDP Project area for foraging, though does not nest within the footprint of the MDP Project facilities.
Least Bell's vireo <i>Vireo bellii pusillus</i>	Federal: FE State: SE	Dense riparian habitats with a stratified canopy, including southern willow scrub, mule fat scrub, and riparian forest.	Low potential to occur within limited riparian habitat associated with proposed MDP Facilities.
Loggerhead shrike <i>Lanius ludovicianus</i>	Federal: None State: None CDFG: SSC	Forages over open ground within areas of short vegetation, pastures with fence rows, old orchards, mowed roadsides, cemeteries,	Low to moderate potential for occurrence within portions of the MDP Facilities.

Species Name	Status	Habitat Requirements	Potential for Occurrence
		golf courses, riparian areas, open woodland, agricultural fields, desert washes, desert scrub, grassland, broken chaparral and beach with scattered shrubs.	
Northern harrier (nesting) <i>Circus cyaneus</i>	Federal: None State: None CDFG: SSC	A variety of habitats, including open wetlands, grasslands, wet pasture, old fields, dry uplands, and croplands.	Low to moderate potential for occurrence within the MDP Project area for foraging, though does not nest within the footprint of the MDP Project facilities.
Peregrine falcon (nesting) <i>Falco peregrinus anatum</i>	Federal: FSC State: SE CDFG: CFP	Although part of its historic breeding range, this species does not breed in southern California. In the west, breeding habitat consists of high cliffs along the coast.	Low to moderate potential for occurrence within the MDP Project area for foraging, though does not nest within the footprint of the MDP Project facilities.
Prairie falcon (nesting) <i>Falco mexicanus</i>	Federal: None State: None CDFG: SSC	Breeds in mountainous regions and shortgrass prairies, nesting on cliff ledges.	Low to moderate potential for occurrence within the MDP Project area for foraging, though does not nest within the footprint of the MDP Project facilities.
Sharp-shinned hawk (nesting) <i>Accipiter striatus</i>	Federal: None State: None CDFG: SSC	Breeds in young coniferous forests with high canopy associations. Habitats that they are documented to use include ponderosa pine, black oak, riparian deciduous, mixed conifer, and Jeffrey pine.	Low to moderate potential for occurrence within the MDP Project area for foraging, though does not nest within the footprint of the MDP Project facilities.
Southern California rufous-crowned sparrow <i>Aimophila ruficeps canescens</i>	Federal: None State: None	Grass covered hillsides, coastal sage scrub, and chaparral.	Not expected to occur within the MDP Facilities due to a lack of suitable habitat.
Southwestern willow flycatcher <i>Empidonax traillii extimus</i>	Federal: FE State: SE	Riparian woodlands along streams and rivers with mature dense thickets of trees and shrubs.	Not expected to occur within the MDP Facilities due to a lack of suitable habitat.
Tricolored blackbird <i>Agelaius tricolor</i>	Federal: FSC State: None CDFG: SSC	Breeding colonies require nearby water, a suitable nesting substrate, and open-range foraging habitat of natural grassland, woodland, or agricultural cropland.	Not expected to occur within the MDP Facilities due to a lack of suitable habitat.

Species Name	Status	Habitat Requirements	Potential for Occurrence
Western yellow-billed cuckoo <i>Coccyzus americanus occidentalis</i>	Federal: FC State: SE	Dense, wide riparian woodlands with well-developed understories.	Not expected to occur within the MDP Facilities due to a lack of suitable habitat.
White-tailed kite (nesting) <i>Elanus leucurus</i>	Federal: None State: None CDFG: CFP	Low elevation open grasslands, savannah-like habitats, agricultural areas, wetlands, and oak woodlands. Dense canopies used for nesting and cover.	Low to moderate potential for occurrence within the MDP Project area for foraging, though does not nest within the footprint of the MDP Project facilities.
Yellow-breasted chat <i>Icteria virens</i>	Federal: None State: None CDFG: SSC	Dense, relatively wide riparian woodlands and thickets of willows, vine tangles, and dense brush with well-developed understories.	Not expected to occur within the MDP Facilities due to a lack of suitable habitat.
Yellow warbler <i>Setophaga petechia</i>	Federal: None State: None CDFG: SSC	Breed in lowland and foothill riparian woodlands dominated by cottonwoods, alders, or willows and other small trees and shrubs typical of low, open-canopy riparian woodland. During migration, forages in woodland, forest, and shrub habitats.	Not expected to occur within the MDP Facilities due to a lack of suitable habitat.
Mammals			
Los Angeles pocket mouse <i>Perognathus longimembris brevinasus</i>	Federal: None State: None CDFG: SSC	Fine, sandy soils in coastal sage scrub and grasslands.	Low potential for occurrence within portions of the MDP Facilities.
Northwestern San Diego pocket mouse <i>Chaetodipus fallax fallax</i>	Federal: None State: None CDFG: SSC	Coastal sage scrub, sage scrub/grassland ecotones, and chaparral.	Moderate to high potential for occurrence within portions of the MDP Facilities.
San Diego black-tailed jackrabbit <i>Lepus californicus bennettii</i>	Federal: None State: None CDFG: SSC	Occupies a variety of habitats, but is most common among shortgrass habitats. Also occurs in sage scrub, but needs open habitats.	Moderate to high potential for occurrence within portions of the MDP Facilities.
San Diego desert woodrat <i>Neotoma lepida intermedia</i>	Federal: None State: None CDFG: SSC	Occurs in a variety of shrub and desert habitats, primarily associated with rock outcrops, boulders, cacti, or areas of dense undergrowth.	Not expected to occur within the MDP Facilities due to a lack of suitable habitat.

Species Name	Status	Habitat Requirements	Potential for Occurrence		
Stephens' kangaroo rat <i>Dipodomys stephensi</i>	Federal: FE State: ST	Open grasslands or sparse shrublands with less than 50% vegetation cover during the summer.	Moderate to high potential for occurrence within portions of the MDP Facilities.		
<table border="0" style="width: 100%;"> <tr> <td style="width: 50%; vertical-align: top;"> <p>Federal (FESA) FE - Federally Endangered FT - Federally Threatened FSC - Federal Species of Concern BCC – Birds of Conservation Concern</p> <p>CDFG SSC - California Species of Special Concern CFP - Fully Protected WL – Watch List</p> </td> <td style="width: 50%; vertical-align: top;"> <p>State (CESA) SE - State Endangered ST - State Threatened</p> </td> </tr> </table>				<p>Federal (FESA) FE - Federally Endangered FT - Federally Threatened FSC - Federal Species of Concern BCC – Birds of Conservation Concern</p> <p>CDFG SSC - California Species of Special Concern CFP - Fully Protected WL – Watch List</p>	<p>State (CESA) SE - State Endangered ST - State Threatened</p>
<p>Federal (FESA) FE - Federally Endangered FT - Federally Threatened FSC - Federal Species of Concern BCC – Birds of Conservation Concern</p> <p>CDFG SSC - California Species of Special Concern CFP - Fully Protected WL – Watch List</p>	<p>State (CESA) SE - State Endangered ST - State Threatened</p>				

The following is a discussion of selected special-status animals evaluated for the MDP Project area, as it relates to MSHCP requirements, or other compliance requirements:

4.3.1 MSHCP Riparian/Riverine and Vernal Pool Species

Volume I, Section 6.1.2 of the MSHCP describes the process through which the protection of riparian/riverine areas and vernal pools would occur within the MSCHP Plan Area. Individual projects that impact riparian areas, vernal pools, and other seasonal pool habitat, must conduct habitat assessments and focused surveys (within suitable habitat) for three riparian bird species and three species of fairy shrimp.

Riparian Birds

For projects impacting riparian habitat, the MSHCP requires habitat assessments and focused surveys (within suitable habitat) for the least Bell’s vireo (LBV), southwestern willow flycatcher (SWWF), and western yellow-billed cuckoo (WYBC). The SWWF and WYBC do not occur within the MDP Project area due to a lack of suitable habitat. The LBV is generally not expected to occur within the MDP Project area, however limited riparian habitat associated with a few alignments may have a low potential to support LBV. This includes riparian habitat within Line K.

Fairy Shrimp

Pursuant to the MSHCP, qualified biologists shall map suitable habitat for the Riverside fairy shrimp (*Streptocephalus woottoni*), vernal pool fairy shrimp (*Branchinecta lynchi*), and Santa Rosa fairy shrimp (*Lindieriella santarosae*), which depending on the species may include vernal pools, ephemeral ponds, stock ponds, and other features that may support fairy shrimp. If suitable habitat is present, and proposed projects do not avoid the habitat, then focused surveys

shall be conducted following approved protocols. Based on a general review of the MDP Project area, habitat to support listed fairy shrimp is not expected to occur within the proposed MDP Facilities. However, facility-specific assessments would be necessary to make formal determinations of habitat suitability.

4.3.2 Burrowing Owl

Volume I, Section 6.3.2 of the MSHCP requires habitat assessments and focused surveys (within suitable habitat) for the western burrowing owl for projects occurring within the burrowing owl survey area. As noted above, the majority of the proposed MDP Facilities occur within the MSHCP burrowing owl survey area. Many of the proposed facilities occur within existing paved roads that do not provide habitat for burrowing owls. However, many of the proposed facilities coincide with agricultural areas and grasslands that have some potential to support burrowing owls. All or portions of the following facilities contain potentially suitable habitat for the burrowing owl, and therefore will require facility-specific assessments, including focused burrow surveys and potentially focused owl surveys: A, A-1, A-4, A-5, A-6, B, B-4, C, D-3, D-5, D-8, E-1, E-3 through E-8, F, F-15, F-16, G, G-2, G-3, G-4, G-7, G-10, G-11, H, H-3, H-4, H-5, J, J-7, J-8, K, K-1, K-2, and all proposed basins.

4.3.3 Los Angeles Pocket Mouse

Volume I, Section 6.3.2 of the MSHCP requires habitat assessments and focused surveys (within suitable habitat) for specific small mammals when a project occurs within a designated MSHCP mammal survey area. A portion of one proposed MDP alignment (Line F) occurs within the MSHCP mammal survey area for the Los Angeles pocket mouse (LAPM).

LAPM habitat is generally defined as fine, sandy soils in coastal sage scrub and grasslands. The MSHCP indicates that LAPM habitat has never been specifically defined, although Grinnell (1933) indicated that the subspecies "inhabits open ground of fine sandy composition" (cited in Brylski *et al.* 1993). This observation is supported by others who also state that the LAPM prefers fine, sandy soils and may utilize these soil types for burrowing (*e.g.*, Jameson and Peters 1988). LAPM may be restricted to lower elevation grassland and coastal sage scrub (Patten *et al.* 1992).

The MSHCP also states that vegetation associations probably are important for LAPM and, like other heteromyid species, LAPM probably prefers sparsely vegetated habitats. For another subspecies (Pacific pocket mouse, *P. l. pacificus*), evidence indicates that mice avoid dense grass cover because of difficulty locomoting and finding seeds (M. Pavelka 1998-99; cited in Spencer and Schaefer 2000). However, soil characteristics probably also must be appropriate for a site to support the Los Angeles pocket mouse. Nonetheless, the habitat associated with the LAPM include non-native grassland, Riversidean sage scrub, Riversidean alluvial fan sage scrub, chaparral and redshank chaparral.

The portion of Line F within the LAPM survey area is mapped by the MSHCP as non-native grassland. The areas appears to be regularly disturbed through disking, but likely contains soils with a potential to support LAPM. Given the disturbed nature of the area, the probability of

supporting LAPM is likely low. A project-specific LAPM habitat assessment should be conducted as part of the development of the parcel containing the proposed alignment.

4.3.4 Stephens' Kangaroo Rat

Stephens' kangaroo rat (SKR) is federally listed as endangered and state listed as threatened. SKR is found almost exclusively in open grasslands or sparse shrublands with cover of less than 50 percent during the summer (*e.g.*, Bleich 1973; Bleich and Schwartz 1974; Grinnell 1933; Lackey 1967; O'Farrell 1990; Thomas 1973). O'Farrell (1990) further clarified this association and argues that the proportion of annual forbs and grasses is important because Stephens' kangaroo rats avoid dense grasses (for example, non-native bromes [*Bromus spp.*]) and are more likely to inhabit areas where the annual forbs disarticulate in the summer and leave more open areas. Soil type also is an important habitat factor for SKR occupation (O'Farrell and Uptain 1989; Price and Endo 1989). As a fossorial (burrowing) animal, the Stephens' kangaroo rat typically is found in sandy and sandy loam soils with a low clay to gravel content, although there are exceptions where they can utilize the burrows of Botta's pocket gopher (*Thomomys bottae*) and California ground squirrel (*Spermophilus beecheyi*). Also, Price and Endo (1989) suggest that sandy soils may be necessary for sand bathing, which keeps oils from building up in their fur. Sand bathing also may serve an important social communication function (Randall 1993). As noted by others (*e.g.*, Brown and Harney 1993), kangaroo rats tend to avoid rocky soils. SKR may be found on rocky soils, but population densities generally are much lower.

Within western Riverside County, SKR is a Covered Species pursuant to the SKR Habitat Conservation Plan (HCP) and the MSHCP. The SKR HCP initially established Core Reserves for the conservation of key SKR populations. Outside of the Core Reserves, the HCP established a fee assessment area by which individual projects are granted coverage under the HCP by payment of SKR fees. The MSHCP, through its goals for SKR, reaffirms the conservation goals of the SKR HCP, while the expanding the coverage area outside of the original coverage boundaries of the SKR HCP. Neither the SKR HCP or MSHCP requires project-specific SKR surveys for sites located outside of the existing Core Reserves. Instead, the payment of SKR fees are sufficient to obtain take authorization for SKR, unless specific lands are targeted for conservation by SKR HCP or MSHCP.

Portions of the MDP Project area contain habitat suitable to support SKR, including the grassland areas, and to some extent the agricultural areas. However, all of the proposed MDP Facilities occur within the SKR fee assessment area, and outside of the existing SKR reserves and areas additionally targeted for SKR conservation.

4.4 Nesting Birds

Portions of the proposed MDP Facilities contains trees, shrubs, and herbaceous vegetation with the potential to support nesting birds. The Migratory Bird Treaty Act (MBTA) and California Fish and Game Code prohibit impacts to nesting birds.⁴

4.5 Raptor Foraging Habitat

Substantial portions of the MDP Project area represent valuable foraging habitat for raptors. Raptors known or with a potential to forage within the Project area include, but are not limited to, red-tailed hawk (*Buteo jamaicensis*), red-shouldered hawk (*Buteo lineatus*), ferruginous hawk (*Buteo regalis*), Swainson's hawk (*Buteo swainsonii*), northern harrier (*Circus cyaneus*), golden eagle (*Aquila chrysaetos*), white-tailed kite (*Elanus leucurus*), Cooper's hawk (*Accipiter cooperi*), sharp-shinned hawk (*Accipiter striatus*), American kestrel (*Falco sparverius*), merlin (*Falco columbarius*), prairie falcon (*Falco mexicanus*), and peregrine falcon (*Falco peregrinus anatum*).

4.6 Jurisdictional Waters

Based on a review of aerial imagery and roadside observations, the MDP Project area contains several drainage features that would be considered waters of United States subject to the jurisdiction of the Corps and Regional Board, and waters of the State subject to the jurisdiction of CDFG. In addition, there are at least several other areas with the potential to support jurisdictional waters, but that are likely maintained by agricultural activities. Exhibit 7 provides locations of the known, potential jurisdictional waters. The MDP Project area also contains numerous roadside ditches, some of which may be regulated by one or more of the resource agencies. For example, segments of roadside ditches occur along Redlands Boulevard both north and south of SR-60.

4.7 MSHCP Riparian/Riverine Areas and Vernal Pools

4.7.1 Riparian/Riverine Areas

Many of the drainage features discussed above would be considered "riverine" pursuant to the MSHCP, some of which also support riparian habitat. Artificially-created features, such as the roadside ditches, would be excluded from the MSHCP definitions of riparian/riverine areas. Exhibit 7, which identifies potential jurisdictional waters, is also a good representation of MSHCP riparian/riverine features within the MDP Project area.

⁴ The MBTA makes it unlawful to take, possess, buy, sell, purchase, or barter any migratory bird listed in 50 C.F.R. Part 10, including feathers or other parts, nests, eggs, or products, except as allowed by implementing regulations (50 C.F.R.21). In addition, sections 3505, 3503.5, and 3800 of the California Department of Fish and Game Code prohibit the take, possession, or destruction of birds, their nests or eggs.

4.7.2 Vernal Pools

Vernal pools are not expected to occur within the footprint of the proposed MDP facilities, although the presence of vernal pools cannot be ruled out with facility-specific surveys.

5.0 IMPACT ANALYSIS AND RECOMMENDED MEASURES

The following discussion examines the potential impacts to plant and wildlife resources that would occur as a result of implementation of the proposed MDP. Impacts (or effects) can occur in two forms, direct and indirect. Direct impacts are considered to be those that involve the loss, modification or disturbance of plant communities, which in turn, directly affect the flora and fauna of those habitats. Direct impacts also include the destruction of individual plants or animals, which may also directly affect regional population numbers of a species or result in the physical isolation of populations thereby reducing genetic diversity and population stability.

Indirect impacts pertain to those impacts that result in a change to the physical environment, but which is not immediately related to a project. Indirect (or secondary) impacts are those that are reasonably foreseeable and caused by a project, but occur at a different time or place. Indirect impacts can occur at the urban/wildland interface of projects, to biological resources located downstream from projects, and other off site areas where the effects of the project may be experienced by plants and wildlife. Examples of indirect impacts include the effects of increases in ambient levels of noise or light; predation by domestic pets; competition with exotic plants and animals; introduction of toxics, including pesticides; and other human disturbances such as hiking, off-road vehicle use, unauthorized dumping, etc. Indirect impacts are often attributed to the subsequent day-to-day activities associated with project build-out, such as increased noise, the use of artificial light sources, and invasive ornamental plantings that may encroach into native areas. Indirect effects may be both short-term and long-term in their duration. These impacts are commonly referred to as “edge effects” and may result in a slow replacement of native plants by non-native invasives, as well as changes in the behavioral patterns of wildlife and reduced wildlife diversity and abundance in habitats adjacent to project sites.

Cumulative impacts refers to two or more individual effects which, when considered together, are considerable or which compound or increase other environmental impacts. A cumulative impact can occur from multiple individual effects from the same project, or from several projects. The cumulative impact from several projects is the change in the environment resulting from the incremental impact of the project when added to other closely related past, present, and reasonably foreseeable probable future projects. Cumulative impacts can result from individually minor but collectively significant projects taking place over a period of time.

5.1 California Environmental Quality Act (CEQA)

5.1.1 Thresholds of Significance

Environmental impacts to biological resources are assessed using impact significance threshold criteria, which reflect the policy statement contained in CEQA, Section 21001(c) of the

California Public Resources Code. Accordingly, the State Legislature has established it to be the policy of the State of California:

“Prevent the elimination of fish or wildlife species due to man’s activities, ensure that fish and wildlife populations do not drop below self-perpetuating levels, and preserve for future generations representations of all plant and animal communities...”

Determining whether a project may have a significant effect, or impact, plays a critical role in the CEQA process. According to CEQA, Section 15064.7 (Thresholds of Significance), each public agency is encouraged to develop and adopt (by ordinance, resolution, rule, or regulation) thresholds of significance that the agency uses in the determination of the significance of environmental effects. A threshold of significance is an identifiable quantitative, qualitative or performance level of a particular environmental effect, non-compliance with which means the effect will normally be determined to be significant by the agency and compliance with which means the effect normally will be determined to be less than significant. In the development of thresholds of significance for impacts to biological resources CEQA provides guidance primarily in Section 15065, Mandatory Findings of Significance, and the CEQA Guidelines, Appendix G, Environmental Checklist Form. Section 15065(a) states that a project may have a significant effect where:

“The project has the potential to substantially degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or wildlife community, reduce the number or restrict the range of an endangered, rare, or threatened species, ...”

Therefore, for the purpose of this analysis, impacts to biological resources are considered potentially significant (before considering offsetting mitigation measures) if one or more of the following criteria discussed below would result from implementation of the proposed project.

5.1.2 Criteria for Determining Significance Pursuant to CEQA

Appendix G of the 1998 State CEQA guidelines indicate that a project may be deemed to have a significant effect on the environment if the project is likely to:

- a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service.*

- b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Game or U.S. Fish and Wildlife Service.*

c) Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means.

d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites.

e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance.

f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan.

5.2 Vegetation/Land Use Types

Implementation of the MDP will result in impacts mainly to agricultural areas and non-native grasslands, with a small amount of potential impact to riverine features, including riparian habitat. Impacts to riparian habitats would be potentially significant, though biological impacts to agricultural areas and non-native grasslands would be less than significant. Impacts to riparian habitats are addressed below under Section 5.6 and 5.7.

5.3 Special-Status Species

As noted above under the project description (Section 1.3), the implementation of the Moreno MDP will be relied upon by Moreno Valley and Riverside County as it reviews and approves existing and proposed development in the MDP Boundary. New development may be required to construct MDP Facilities or set aside rights-of-way for future MDP Facilities, as such, future MSHCP survey/conservation requirements would be applied to individual projects.

Implementation of the MDP has the potential to impact a number of special-status species, including plants and animals. Regarding plants, the MDP Project area does not occur within the NEPSSA and/or CAPSSA, therefore focused plant surveys will not be required pursuant to the MSHCP for individual projects. Depending on the plant species (if any) to be impacted by an individual project, project-specific impacts to special-status plants may be individually and cumulatively significant prior to mitigation. However, since any special-status plant species detected would be covered without additional conservation requirements, participation in (and compliance with) the MSHCP would reduce any impacts to special-status plants to below a level of significance, and additional mitigation would not be required.

The following is a discussion of special-status animal species with recommended measures for individual projects within the MDP Project area, including in some cases, survey/conservation requirements pursuant to the MSHCP.

5.3.1 Burrowing Owl

Pursuant to *Volume I, Section 6.3.2* of the MSHCP, habitat assessments and focused surveys (if suitable habitat is present) are required for individual projects located within the burrowing owl survey area. All or portions of the following facilities are located within the burrowing owl survey area, and will at a minimum require habitat assessments, including focused burrow surveys: A, A-1, A-4, A-5, A-6, B, B-4, C, D-3, D-5, D-8, E-1, E-3 through E-8, F, F-15, F-16, G, G-2, G-3, G-4, G-7, G-10, G-11, H, H-3, H-4, H-5, J, J-7, J-8, K, K-1, K-2, and all proposed basins.

The MDP Project has the potential to impact burrowing owls. Impacts to burrowing owls, including the loss of burrowing owl habitat, would be potentially significant prior to mitigation. The following burrowing owl measures would apply to individual projects associated with undeveloped areas within the burrowing owl survey area:

- Habitat assessments (including focused burrow surveys) will be conducted by a qualified biologist following the MSHCP Burrowing Owl Survey Instructions. If suitable is present, including suitable burrows, then focused owl surveys must be conducted following Step II, Part B of the MSHCP Survey Instructions.
- Pursuant to Objective 5 of the MSHCP species-specific objectives for the burrowing owl, if burrowing owls are detected, then 1) if a project site contains, or is part of an area supporting less than 35 acres of suitable habitat or the survey reveals that the site and the surrounding area supports fewer than 3 pairs of burrowing owls, then the on-site burrowing owls will be passively or actively relocated following accepted protocols; or 2) if the site (including adjacent areas) supports three or more pairs of burrowing owls, supports greater than 35 acres of suitable habitat and is non-contiguous with MSHCP Conservation Area lands, at least 90 percent of the area with long-term conservation value and burrowing owl pairs will be conserved onsite.
- If it is infeasible to conserve owls on site, then the loss of habitat must be mitigated for and approved through a Determination of Biologically Equivalent or Superior Preservation (DBESP). DBESP analyses must be submitted to the USFWS and CDFG for a 60-day review period.
- Pursuant to Objective 6 of the MSHCP species-specific objectives for the burrowing owl, pre-construction presence/absence surveys for burrowing owl will be conducted for project sites with suitable habitat located within the burrowing owl survey area. Pre-construction surveys are to be conducted within 30 days prior to ground disturbance.
- If burrowing owls are to be relocated, subject to approval by the wildlife agencies, active relocation or passive relocation (use of one way doors and collapse of burrows) will occur when owls are present outside the nesting season. Take of active nests will be avoided.

5.3.2 Least Bell's Vireo

The least Bell's vireo is generally not expected to occur within the MDP Project area, due to the limited amount of riparian habitat with suitable structure. However, a low potential may exist in limited portions of a few alignments, such as Line F. *Volume I, Section 6.1.2* of the MSHCP requires habitat assessments and focused surveys for projects that will impact potentially suitable riparian habitat. Any impacts to the least Bell's vireo would be potentially significant prior to mitigation. The following measures for least Bell's vireo will apply to individual projects within the MDP Project area:

- Within areas of suitable riparian habitat, a qualified biologist will conduct protocol presence/absence surveys for the least Bell's vireo following USFWS protocols.
- Pursuant to Objective 3 of the MSHCP species-specific objectives for the least Bell's vireo, if a survey is positive for least Bell's vireo, 90 percent of the occupied portions of the property that provide for long-term conservation value for the vireo shall be conserved in a manner consistent with conservation of the vireo. This will involve including 100 meters of undeveloped landscape adjacent to the habitat conserved. If it is infeasible to conserve at least 90 percent of the habitat, then the loss of habitat must be mitigated for and approved through a Determination of Biologically Equivalent or Superior Preservation (DBESP). DBESP analyses must be submitted to the USFWS and CDFG for a 60-day review period.

5.3.3 Listed Fairy Shrimp

Implementation of the MDP is not expected to result in impacts to listed fairy shrimp due to a general lack of suitable habitat. However, individual projects must be assessed to determine the presence/absence of ponding features (vernal pools, other ephemeral ponds, stock ponds, etc.) with the potential to support listed fairy shrimp. Impacts to listed fairy shrimp would be potentially significant without mitigation.

The following measure will apply to individual projects within the MDP Project area:

- A qualified biologist will assess project sites for habitat with the potential to support listed fairy shrimp, defined as vernal pools, stock ponds, ephemeral ponds, or other human-modified depressions. If potentially suitable habitat is identified, then a qualified biologist will conduct presence/absence surveys for listed fairy shrimp following accepted protocols.
- If listed fairy shrimp are detected, then 90 percent of the occupied portions of the property that provide for long-term conservation value for the fairy shrimp shall be conserved. If it is infeasible to conserve at least 90 percent of the habitat, then the loss of habitat must be mitigated for and approved through a Determination of Biologically Equivalent or Superior Preservation (DBESP). DBESP analyses must be submitted to the USFWS and CDFG for a 60-day review period.

5.3.4 Los Angeles Pocket Mouse

As discussed in Section 4.3.4 of this report, a portion of Line F occurs within the MSHCP survey area for Los Angeles pocket mouse. Although the area has been subject to past disturbance, there is some potential for the pocket mouse to be present. Impacts to the Los Angeles pocket mouse would be potentially significant without mitigation.

The following measure will apply to implementation of the specific portion of Line F:

- A qualified biologist will conduct a habitat assessment for projects located within the MSHCP Los Angeles pocket mouse survey area. If suitable habitat is present, the biologist will conduct a presence/absence trapping study.
- If Los Angeles pocket mouse is detected, then 90 percent of the occupied portions of the property that provide for long-term conservation value for the pocket mouse shall be conserved. If it is infeasible to conserve at least 90 percent of the habitat, then the loss of habitat must be mitigated for and approved through a Determination of Biologically Equivalent or Superior Preservation (DBESP). DBESP analyses must be submitted to the USFWS and CDFG for a 60-day review period.

5.3.5 Stephens' Kangaroo Rat

Implementation of the MDP will result in the potential loss of habitat for Stephens' kangaroo rat (SKR). Individual project impacts to SKR would be potentially significant, without mitigation. The entire MDP Project area occurs within the SKR Fee Assessment area. As such, pursuant to the SKR HCP, individual projects must pay the SKR fee, thereby receiving coverage for impacts to SKR. With the payment of the SKR mitigation fees, impacts to SKR, both individually and cumulatively, would be less than significant.

5.4 Raptor Foraging Habitat

The proposed MDP Project would result in the direct loss of foraging habitat for a number of special-status and common raptors, including the red-tailed hawk, red-shouldered hawk, American kestrel, Cooper's hawk, northern harrier, ferruginous hawk, golden eagle, Swainson's hawk, white-tailed kite, prairie falcon, peregrine falcon, and merlin. The majority of the MDP Project area includes at least moderate quality foraging habitat for the various raptor species, including the agricultural areas, grassland areas, and to a lesser extent the developed areas. Impacts to raptor foraging habitat would be cumulatively significant, and potentially individually significant. With the participation of individual projects in the MSHCP, the loss of raptor foraging habitat would be less than significant.

5.5 Nesting Birds

Implementation of the proposed MDP Project will result in the removal of vegetation (i.e., trees, shrubs, and ground cover) suitable for nesting migratory birds. Impacts to such species are prohibited under the Migratory Bird Treaty Act (MBTA) and California Fish and Game Code. Mitigation measures, including seasonal avoidance of vegetation removal and/or nesting bird

surveys will ensure that migratory birds (and their nests) will not be directly harmed. Condition 5b of the MSHCP Federal Fish and Wildlife permit specifically notes that the MSHCP does not authorize the impacts to nesting birds in lieu of the MBTA. The proposed MDP Project will not directly impact or impede the use of any recognized wildlife nursery sites.

The following measure should be implemented to ensure that individual projects within the MDP Project area will not result in impacts to nesting birds:

- The removal of potential nesting vegetation will be conducted outside of the nesting season (February 1 to August 31) to the extent that this is feasible. If vegetation must be removed during the nesting season, a qualified biologist will conduct a nesting bird survey of potentially suitable nesting vegetation prior to removal. If active nests are identified, the biologist will recommend buffers around the vegetation containing the active nests. The vegetation containing the active nest will not be removed, and no grading will occur within the established buffer, until a qualified biologist has determined that the nest is no longer active (i.e., the juveniles are surviving independent from the nest). If clearing is not conducted within three days of a negative survey, the nesting survey must be repeated to confirm the absence of nesting birds.

5.6 Jurisdictional Waters

Implementation of portions of the MDP Project will result in impacts to jurisdictional waters. Impacts to jurisdictional waters would be cumulatively significant, and potentially individually significant depending on the extent of individual project impacts. The following mitigation measures should be applied to individual projects regarding jurisdictional waters:

- A jurisdictional delineation will be conducted for individual projects to determine the extent of jurisdictional waters impacts.
- Prior to the issuance of grading permits, individual projects will obtain the necessary authorizations from the regulatory agencies for proposed impacts to jurisdictional waters. Authorizations may include, but are not limited to, a Section 404 permit from the Corps, a Section 401 Water Quality Certification from the Regional Board, and a Section 1602 Streambed Alteration Agreement from CDFG.
- Project-specific impacts to jurisdictional waters will be mitigated at a minimum 1:1 ratio in a manner to be determined by the project proponent and to be approved by the Corps, CDFG, and the Regional Board through the permitting process.

5.7 MSHCP Riparian/Riverine Areas and Vernal Pools

Implementation of portions of the MDP Project will result in impacts to MSHCP riverine features, including in some cases, riparian habitat. The MDP Project is not expected to impact vernal pools, but this should be confirmed through the review of individual projects. Pursuant to *Volume I, Section 6.1.2* of the MSHCP, the following measures will be required for individual projects:

- In conjunction with a delineation of jurisdictional waters, MSHCP riparian/riverine areas and vernal pools will be mapped for individual projects.
- If feasible, individual projects will avoid all MSHCP riparian/riverine areas and vernal pools mapped within the project site. If it is infeasible to avoid 100 percent of riparian/riverine areas, the loss of habitat must be mitigated for and approved through a Determination of Biologically Equivalent or Superior Preservation (DBESP). DBESP analyses must be submitted to the USFWS and CDFG for a 60-day review period.

5.8 Indirect Impacts to Biological Resources

Volume I, Section 6.1.4 of the MSHCP (Urban/Wildland Interface Guidelines) addresses indirect effects associated with locating projects in proximity to the MSHCP Conservation Area, including effects associated with drainage, toxics, lighting, noise, and invasives. The proposed MDP Facilities do not occur adjacent to the MSHCP Conservation Area, and therefore are not expected to result in indirect impacts that would adversely affect wildlife resources within the Conservation Area. If individual projects are required to conserve habitats pursuant to Volume I, Section 6.1.2 and/or 6.3.2 of the MSHCP, then indirect effects may become relevant. As such, indirect effects should be evaluated on an individual project basis.

6.0 REFERENCES

- American Ornithologists' Union. 1998. Checklist of North American Birds, Seventh Edition.
- Axelrod, D.I. 1978. The Origin of Coastal Sage Vegetation, Alta and Baja California. *American Journal of Botany* 65(10): 1117-1131.
- Bleich, V.C. 1973. Ecology of rodents at the United States Naval Weapons Station Seal Beach, Fallbrook Naval Weapons Annex, San Diego County, California. M.A. Thesis, California State University, Long Beach.
- Bleich, V.C. and O.A. Schwartz. 1974. Western range extension of Stephens' kangaroo rat (*Dipodomys stephensi*), a threatened species. California Department of Fish and Game 60:208-210.
- Brown, J.H. and B.A. Harney. 1993. Population and community ecology of heteromyid rodents in temperate habitats. In H.H. Genoways and J.H. Brown (eds.) *Biology of the Heteromyidae*, Special Publication No, 10 of the American Society of Mammalogists, pages 618-651.
- Brylski, P., L. Barkley, B. McKernan, S.J. Montgomery, R. Minnich, and M. Price. 1993. Proceedings of the Biology and Management of Rodents in Southern California Symposium. San Bernardino County Museum, Redlands, California, June 26, 1993. Presented by the Southern California Chapter of the Wildlife Society.

- California Department of Fish and Game. 2009 (July). Special Animals. State of California Resources Agency, Sacramento, California.
- California Department of Fish and Game. 2010 (January). State and Federally Listed Endangered and Threatened Animals of California. State of California Resources Agency. Sacramento, California.
- California Department of Fish and Game. March 2011. California Natural Diversity Database: RareFind 3. Records of occurrence for U.S.G.S. 7.5- minute Quadrangle maps: Murrieta, Romoland, and Bachelor Mountain. California Department of Fish and Game, State of California Resources Agency. Sacramento, California.
- California Native Plant Society. 2001. Inventory of Rare and Endangered Plants of California. (Sixth Edition). Rare Plant Advisory Committee, David P. Tibor, Convening Editor, California Native Plant Society. Sacramento, California, 388 pp.
- California Native Plant Society. 2010. Inventory of Rare and Endangered Plants of California. (Seventh Edition). Accessible online at <<http://cnps.web.aplus.net/cgi-bin/inv/inventory.cgi>>
- Grinnell, J. 1933. Review of the recent mammal fauna of California. University of California Publications in Zoology 40:1-124.
- Lackey, J.A. 1967. Biosystematics of *heermanni* group kangaroo rats in southern California. Transactions of the San Diego Society of Natural History 14:313-344.
- Hanes, T. L., R.D. Friesen, and K. Keane. 1989 Alluvial Scrub Vegetation in Coastal Southern California. USDA Forest Service General Technical Report PSW-110. 1989.
- Heady H.F. 1977. Valley grasslands. Pp.491-514. In M.G. Barbour and J. Major (eds.), Terrestrial vegetation of California. John Wiley, New York.
- Hickman, J.C., Ed. 1993. The Jepson Manual: Higher Plants of California. University of California Press. 1,400 pp.
- Holland, R. F. 1986. Preliminary Descriptions of the Terrestrial Natural Communities of California. Nongame-Heritage Program, California Department of Fish and Game.
- Holland, V. L. and David J. Keil. 1995. California Vegetation. Kendall/Hunt Publishing Company. Dubuque, Iowa.
- Jameson, E.W. Jr. and H.J. Peeters. 1988. *California Mammals*. University of California Berkeley Press. 403 pp.
- Kirkpatrick J.B. and C.F. Hutchinson 1977. The Community Composition of Californian Coastal Sage Scrub. Vegetation vol. 35, 1:21-33.

- Kirkpatrick J.B. and C.F. Hutchinson 1980. The Environmental Relationships of Californian Coastal Sage Scrub and some of its component communities and species. *Journal of Biogeography* 7:23-28.
- Mack, R.N. 1989. Temperate grasslands vulnerable to plant invasions: characteristics and consequences. Pp. 155-179 In J.A. Drake, H.A. Mooney, F. di Castri, R. H. Groves, F.J. Kruger, M. Rejmanek, and M. Williamson (eds.), *Biological invasions: a global perspective*. John Wiley and Sons, Chichester, N.Y.
- Mc Naughton S.J. 1968. Structure and function in California grasslands. *Ecology* 49:962-972.
- Nelson, J. 1984. Rare plant survey guidelines. .In: *Inventory of rare and endangered vascular plants of California*. J. Smith and R. York (eds.). Special Publication No. 1. California Native Plant Society.
- O'Farrell, M.J. 1990. Stephens' kangaroo rat: natural history, distribution, and current status. In P.J. Bryant and J. Remington (eds.) *Memoirs of the Natural History Foundation of Orange County* 3:77-84.
- O'Farrell, M.J. and C.E. Uptain. 1989. Assessment of population and habitat status of the Stephens' kangaroo rat (*Dipodomys stephensi*). California Department of Fish and Game Nongame Bird and Mammal Section, Report 72.
- Patten, M.A., S. J. Myers, C. McGaugh, and J.R. Easton. ca 1992. Los Angeles pocket mouse (*Perognathus longimembris brevinasus*). Unpublished report by Tierra Madre Consultants, Riverside, California.
- Price, M.V. and P.R. Endo. 1989. Estimating the distribution and abundance of a cryptic species, *Dipodomys stephensi* (Rodentia: Heteromyidae), and implications for management. *Conservation Biology* 3:293-301.
- Randall, J.A. 1993. Behavioural adaptations of desert rodents (Heteromyidae). *Animal Behaviour* 45:263-287.
- Reiser, C.H. 2001. *Rare Plants of San Diego County, 2001 edition*. Unpublished. Aquafir Press, San Diego, California.
- Riverside County Integrated Project. 2003. *Western Riverside County Multiple Species Habitat Conservation Plan*.
- Roberts, F.M, S.D. White, A.C. Sanders, D.E. Bramlet, and S. Boyd. 2004. *The Vascular Plants of Western Riverside County, California; An Annotated Checklist*. F.M. Roberts Publications, San Luis Rey, California. 192 pp.
- Sawyer, J.O. and T. Keeler-Wolf. 1995. *A Manual of California Vegetation*. California Native Plant Society.

- Smith, D.S. 1996. Composition and Diversity of Diegan Alluvial Scrub. Master's Thesis. San Diego State University.
- Smith, R.L. 1980. Alluvial Scrub Vegetation of the San Gabriel River Floodplain, California. *Madrono* vol.27, 3:126-138.
- Spencer, W. and C. Schaefer. 2000. Pacific pocket mouse studies program phase I report: task 1 - translocation feasibility, task 3 - dispersal characteristics. Prepared for Foothill/Eastern Transportation Corridors Agencies and U.S. Fish and Wildlife Service.
- Stebbins, R. C. 1954. Amphibians and reptiles of western North America. McGraw Hill Book Company, New York, New York.
- Thomas, S.R. 1973. Stephens' kangaroo rat survey. California Department of Fish and Game, Special Wildlife Investigation, Job II-5.6 (final report), 10 pp.
- Westman, W.E. 1982. Coastal Sage Scrub Succession. Pages 91-99 *in*: Proceedings of the Symposium on Dynamics and Management of Mediterranean-Type Ecosystems. C.E. Conrad and W.C. Oechel, technical coordinators.
- White, S.D. and W. D. Padley. 1997. Coastal Sage Scrub Series of Western Riverside County, California. *Madrono* 44(1): 95-105
- Baker, H.G. 1989. Sources of the naturalized grasses and herbs. Pp 29-38. In L.F. Huenneke and H.A. Mooney, (eds.) *Grassland structure and function: California annual grasslands*. Kluwer Academic Publishers, Boston, MA.

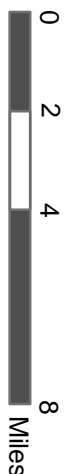
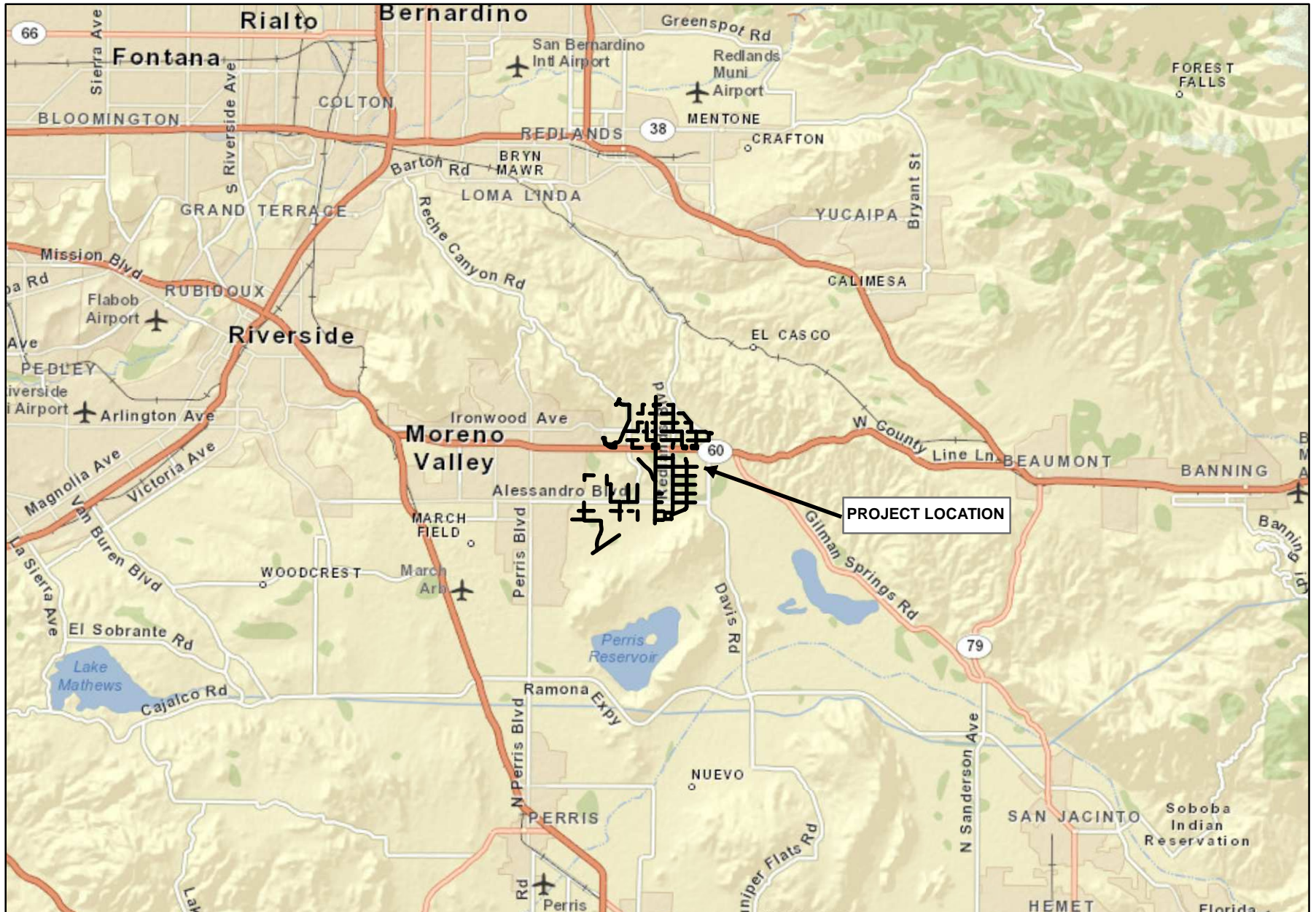
7.0 CERTIFICATION

I hereby certify that the statements furnished above and in the attached exhibits present data and information required for this biological evaluation, and that the facts, statements, and information presented are true and correct to the best of my knowledge and belief.

Signed: _____

Date: _____

Source: ESRI World Street Map



**MORENO VALLEY
MASTER DRAINAGE PLAN**

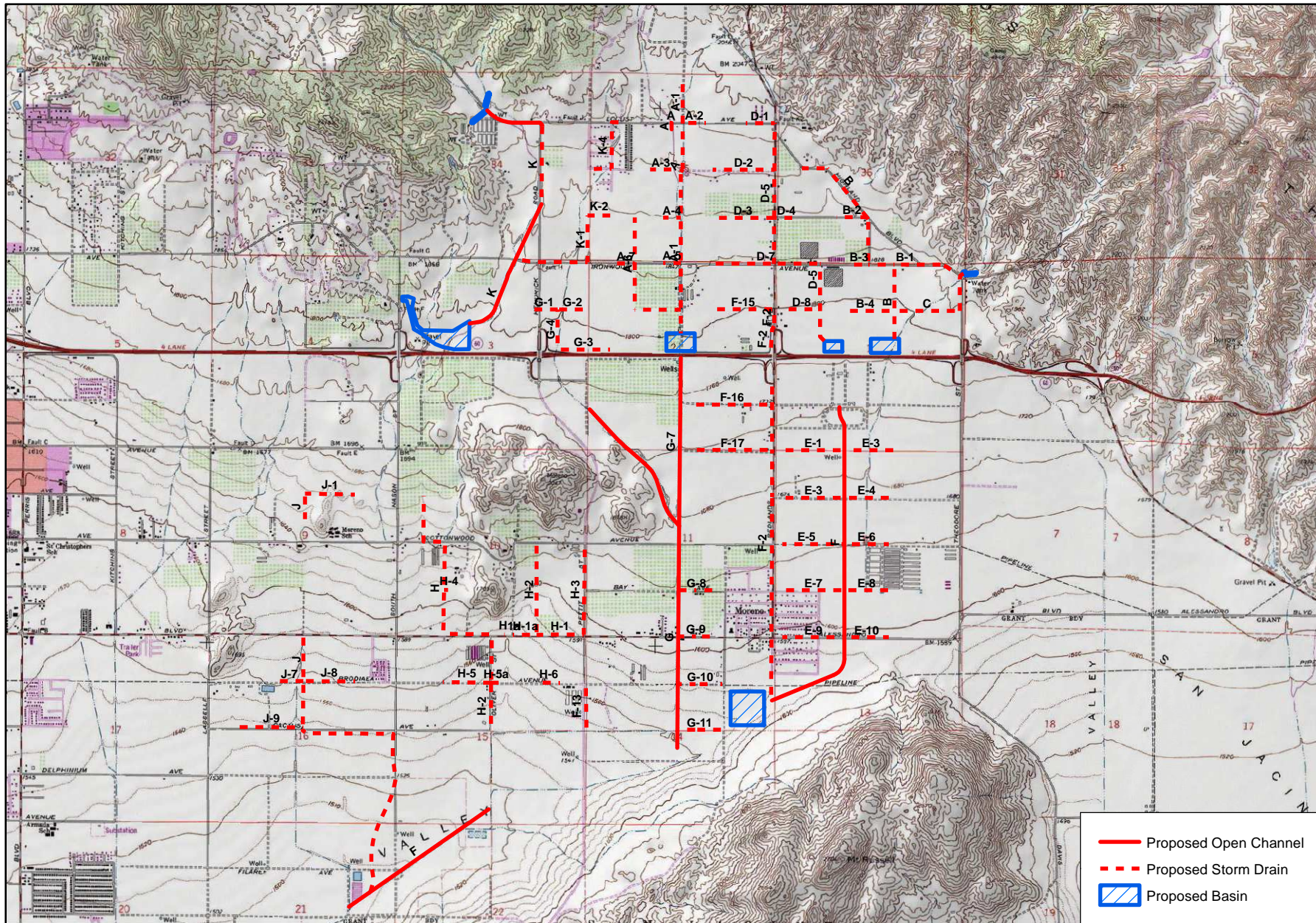
Regional Map

GLENN LUKOS ASSOCIATES



Exhibit 1

Adapted from USGS Sunnymead, CA quadrangle



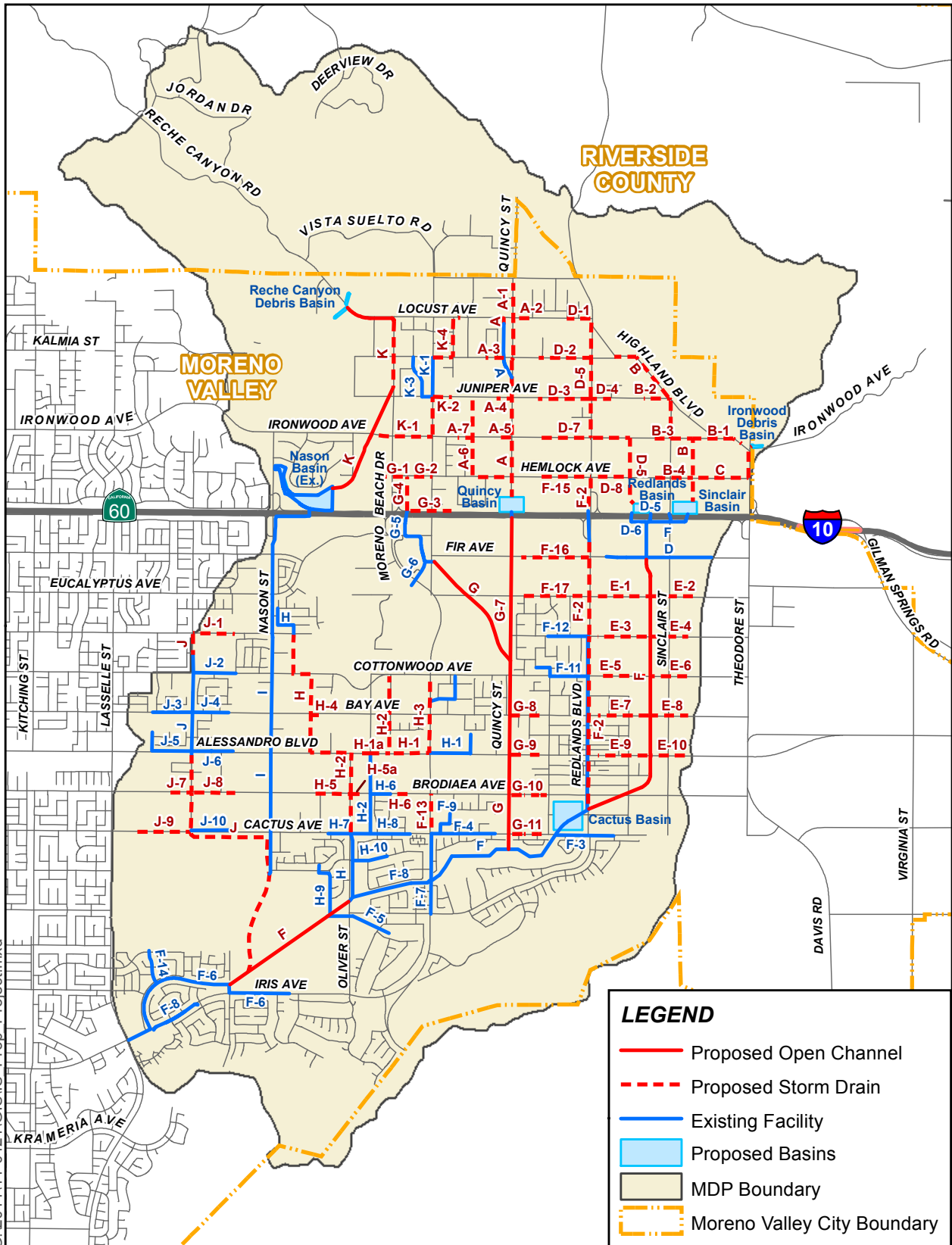
MORENO VALLEY MASTER DRAINAGE PLAN

Vicinity Map

GLENN LUKOS ASSOCIATES



Exhibit 2

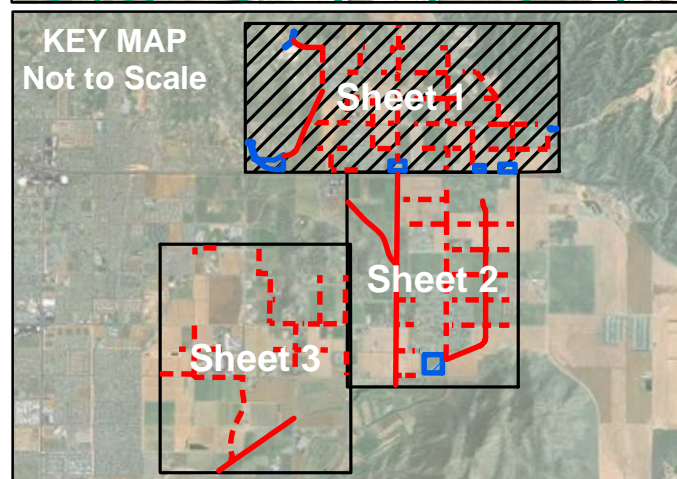
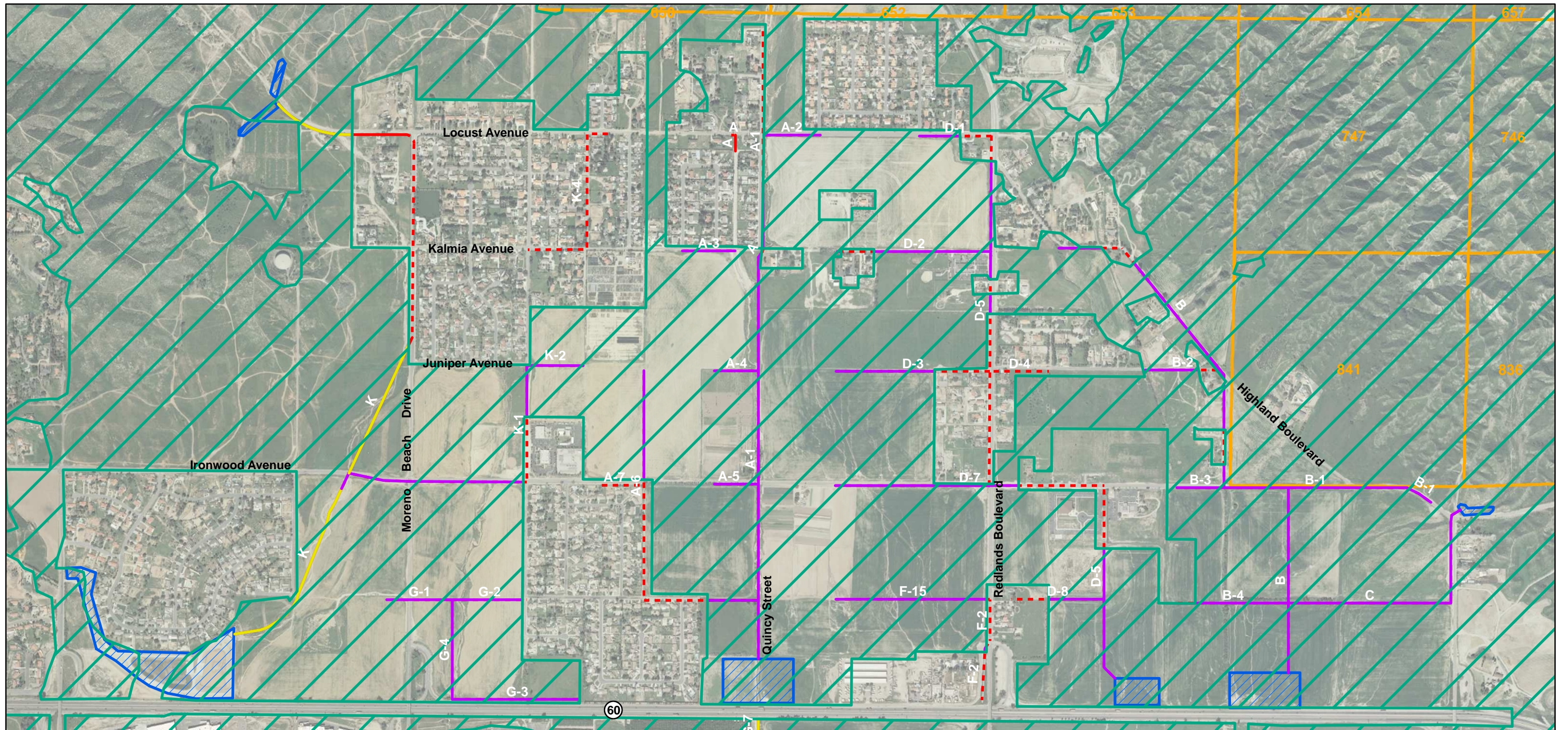


G:\2011\11-0121\GIS\Prop Project.mxd

Source: County of Riverside GIS, 2011.

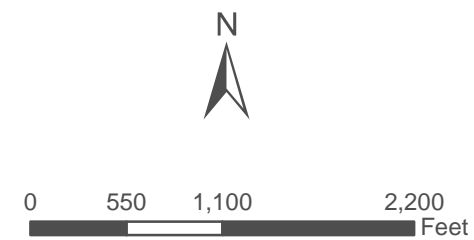
Figure 2 - Proposed Project
Moreno Master Drainage Plan Revision





Legend

- Proposed Open Channel within MSHCP Burrowing Owl Survey Area
- Proposed Storm Drain within MSHCP Burrowing Owl Survey Area
- Proposed Open Channel
- - - Proposed Storm Drain
- Proposed Basin
- MSHCP Burrowing Owl Survey Area
- MSHCP Criteria Cell
- MSHCP Mammal Survey Area



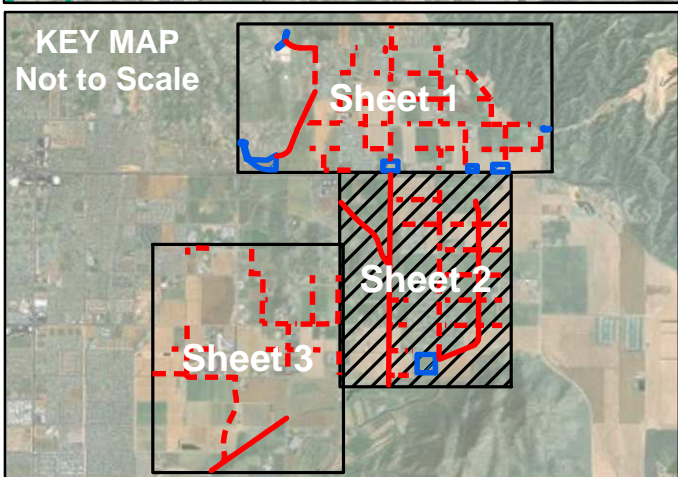
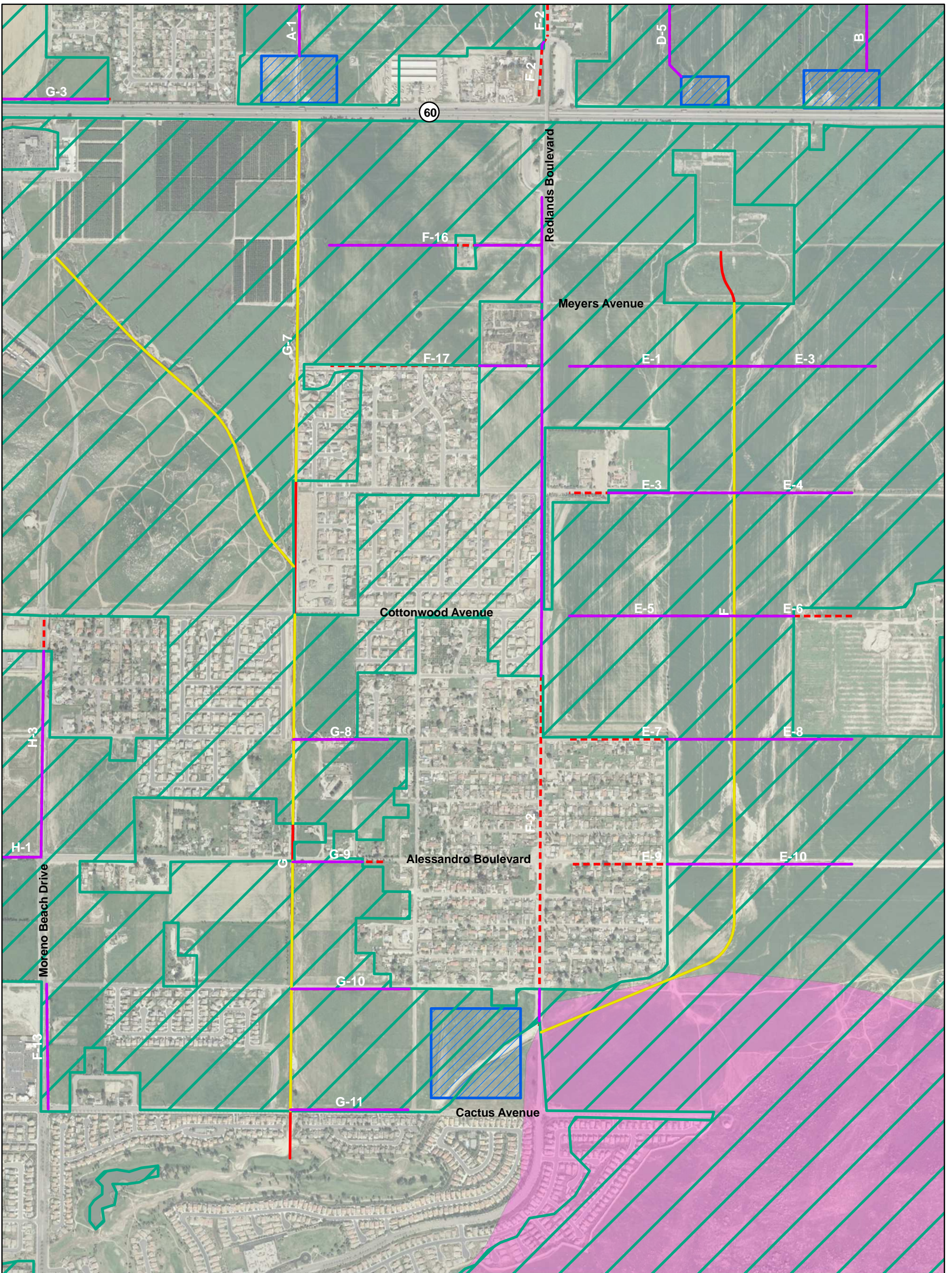
**MORENO VALLEY
MASTER DRAINAGE PLAN**

MSHCP Map

GLENN LUKOS ASSOCIATES

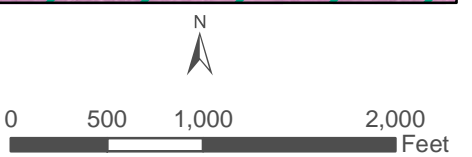


Exhibit 4 Sheet 1



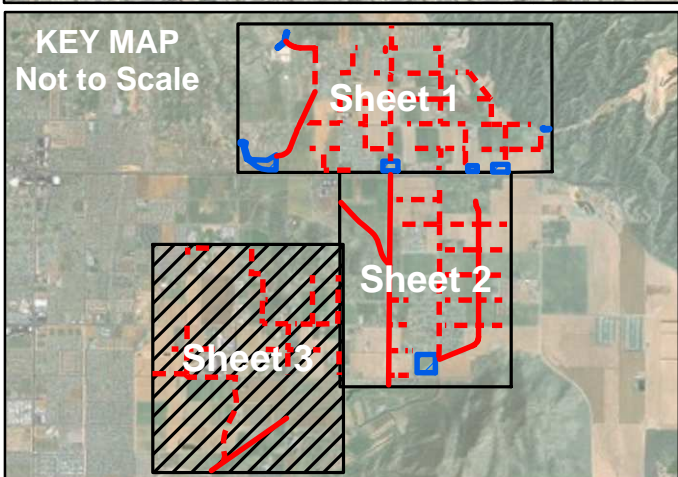
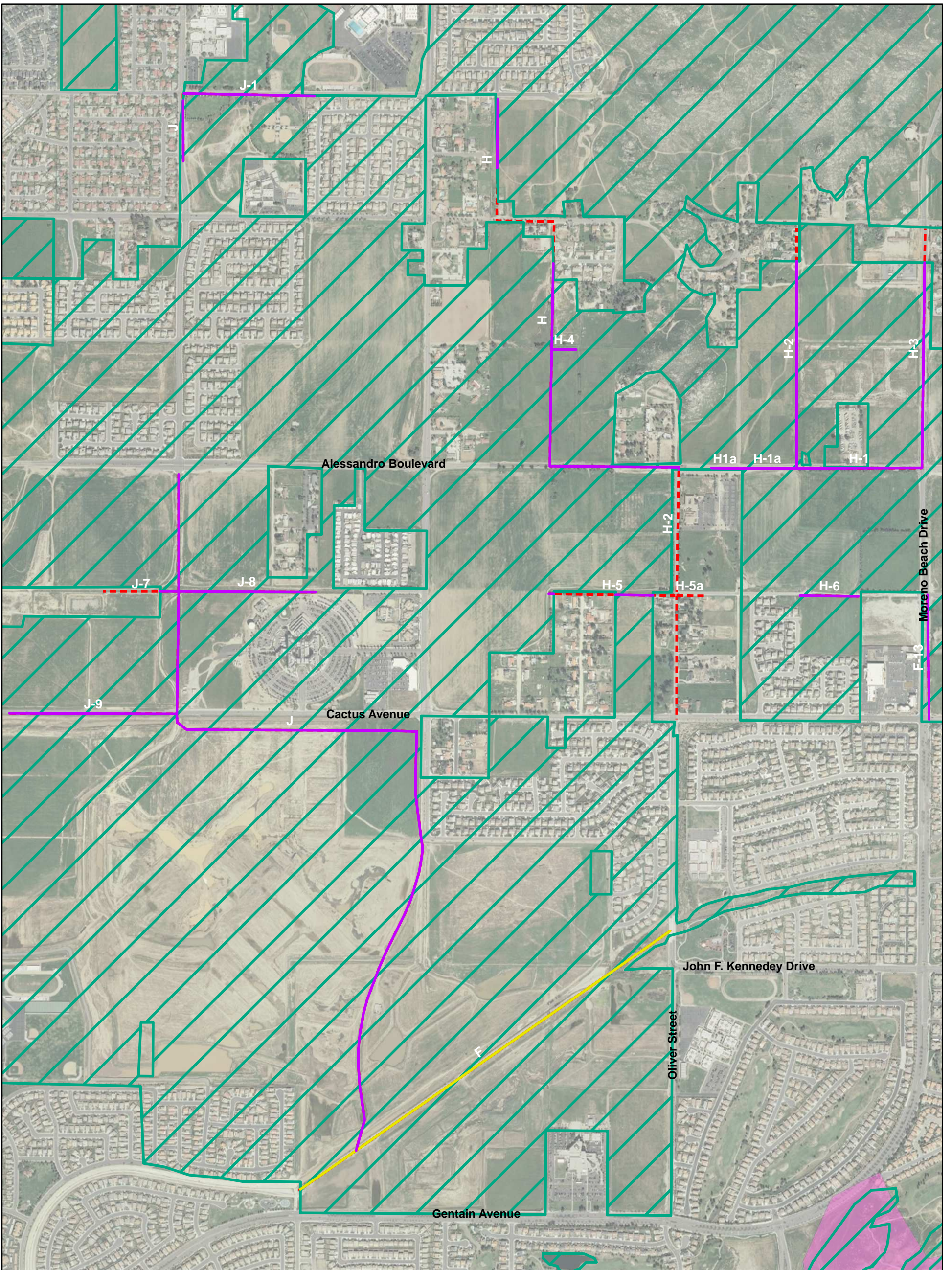
Legend

- Proposed Open Channel within MSHCP Burrowing Owl Survey Area
- Proposed Storm Drain within MSHCP Burrowing Owl Survey Area
- Proposed Open Channel
- - - Proposed Storm Drain
- Proposed Basin
- MSHCP Burrowing Owl Survey Area
- MSHCP Criteria Cell
- MSHCP Mammal Survey Area




**MORENO VALLEY
MASTER DRAINAGE PLAN**
MSHCP Map

GLENN LUKOS ASSOCIATES



- Legend**
- Proposed Open Channel within MSHCP Burrowing Owl Survey Area
 - Proposed Storm Drain within MSHCP Burrowing Owl Survey Area
 - Proposed Open Channel
 - - - Proposed Storm Drain
 - Proposed Basin
 - MSHCP Burrowing Owl Survey Area
 - MSHCP Criteria Cell
 - MSHCP Mammal Survey Area



0 500 1,000 2,000
Feet

**MORENO VALLEY
MASTER DRAINAGE PLAN**
MSHCP Map

GLENN LUKOS ASSOCIATES


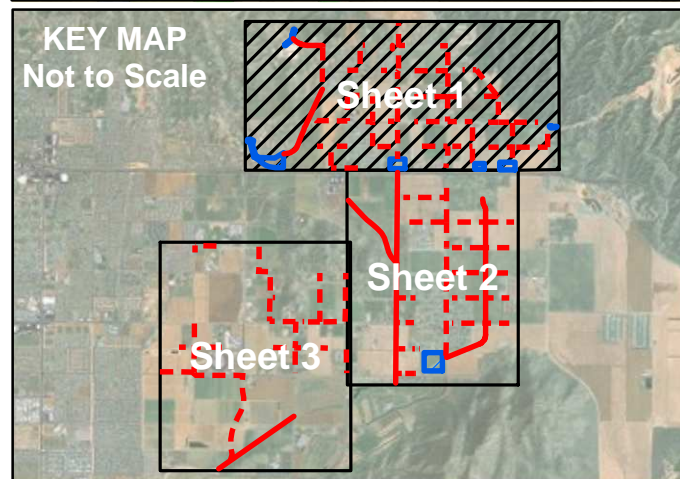
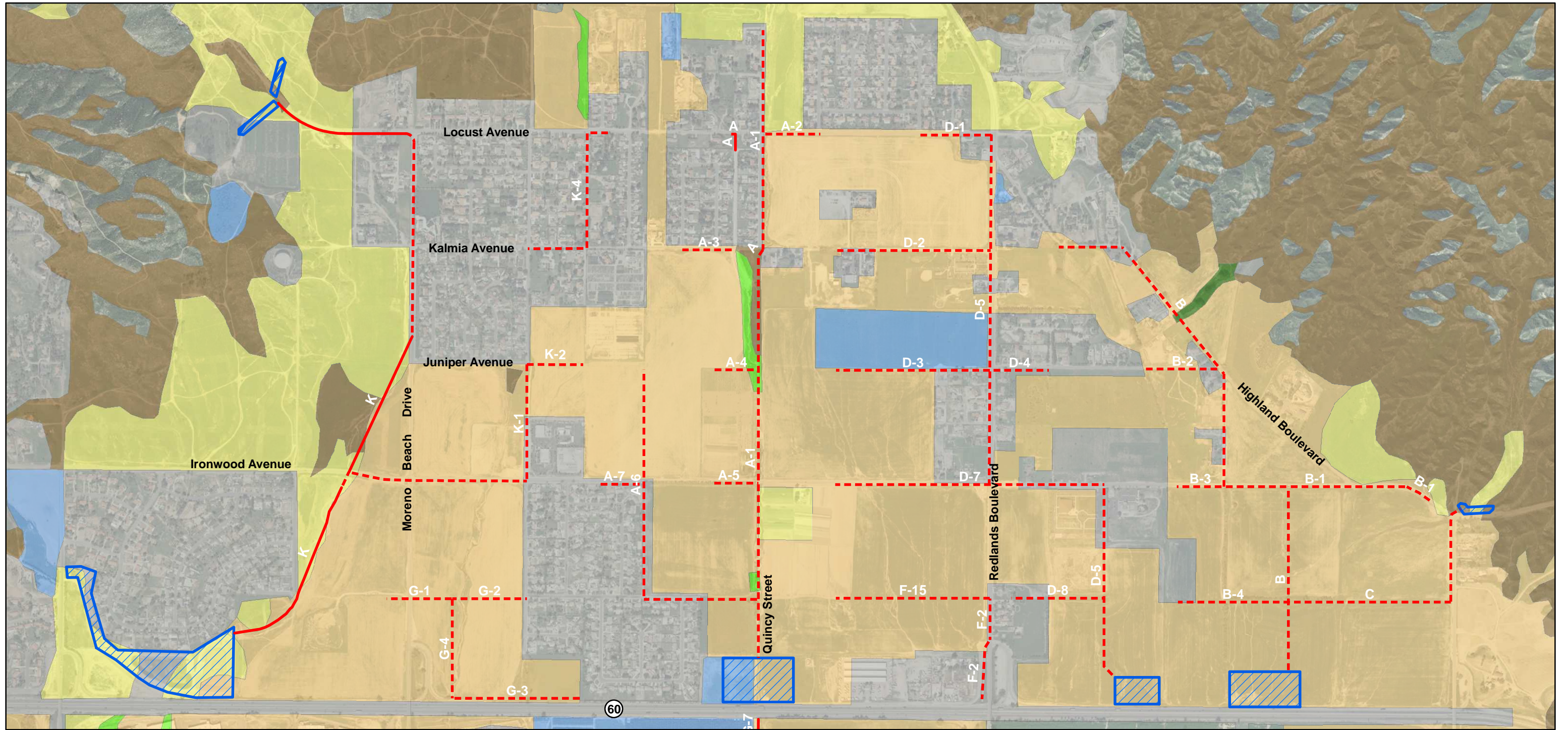


Exhibit 4 Sheet 3

X:\0363-THE REST\0640-22MORE\640-22_GIS\MSHCP_GIS\640-22MSHCPSheet3.mxd
February 15, 2012



Legend

- Proposed Open Channel
- - - Proposed Storm Drain
- Proposed Basin
- Disturbed Alluvial
- Field Croplands
- Grove/Orchard
- Non-native Grassland
- Oak Woodland
- Residential/Urban/Exotic
- Riparian Scrub
- Riversidean Sage Scrub



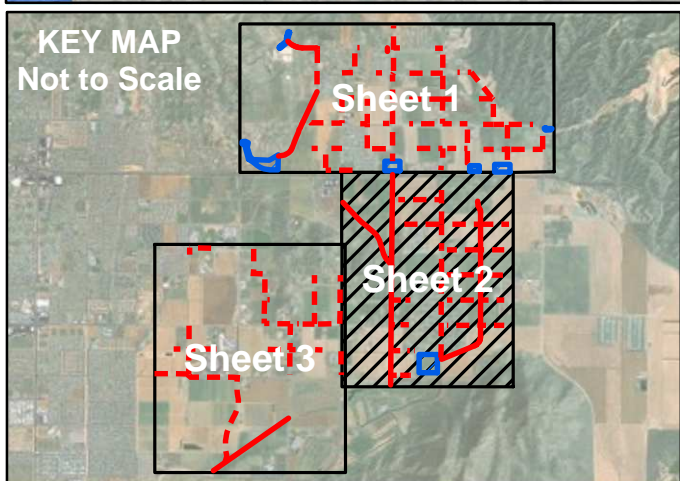
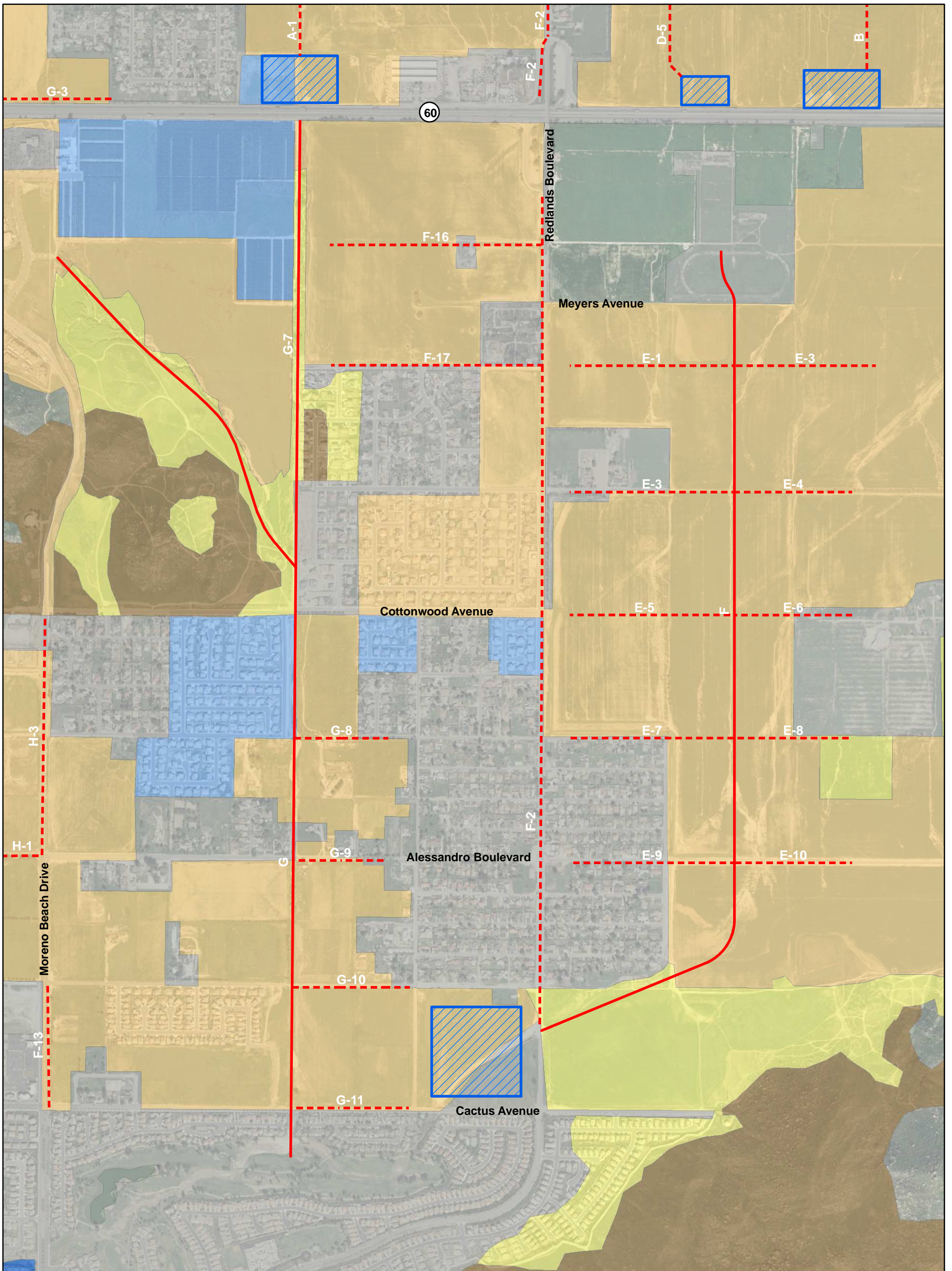
**MORENO VALLEY
MASTER DRAINAGE PLAN**

Vegetation Map

GLENN LUKOS ASSOCIATES



Exhibit 5 Sheet 1



Legend

- Proposed Open Channel
- Proposed Storm Drain
- Proposed Basin
- MSHCP Vegetation Types**
- Disturbed Alluvial
- Field Croplands
- Grove/Orchard
- Non-native Grassland
- Oak Woodland
- Residential/Urban/Exotic
- Riparian Scrub
- Riverside Sage Scrub



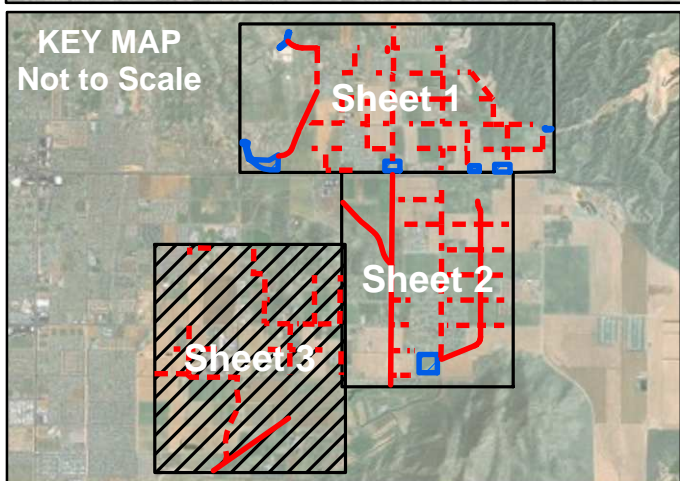
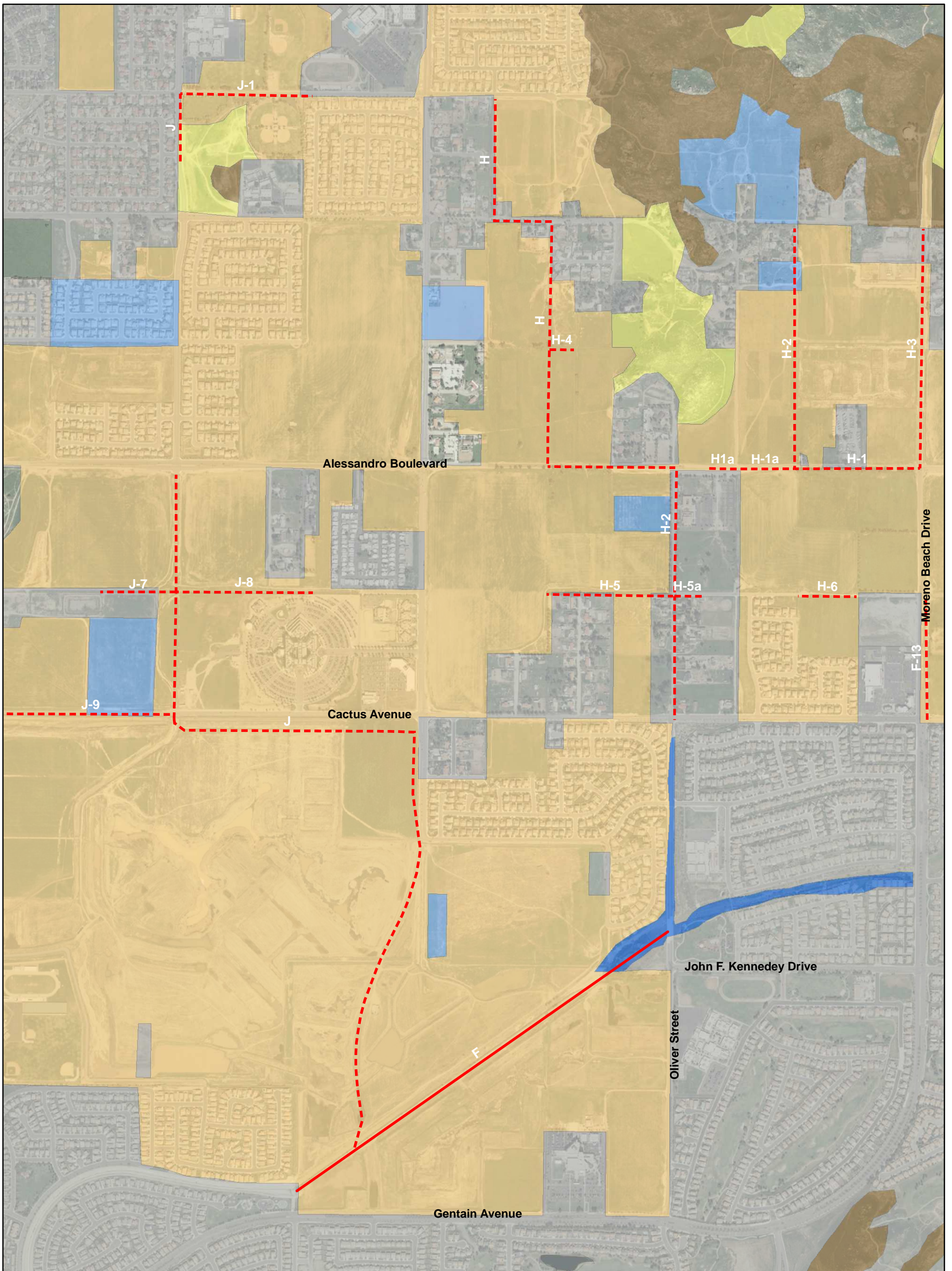
**MORENO VALLEY
MASTER DRAINAGE PLAN**

Vegetation Map

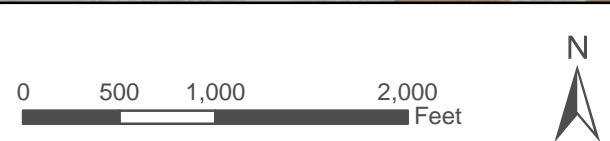
GLENN LUKOS ASSOCIATES



Exhibit 5 Sheet 2



- Legend**
- Proposed Open Channel
 - - - Proposed Storm Drain
 - Proposed Basin
- MSHCP Vegetation Types**
- Disturbed Alluvial
 - Field Croplands
 - Grove/Orchard
 - Non-native Grassland
 - Oak Woodland
 - Residential/Urban/Exotic
 - Riparian Scrub
 - Riversidean Sage Scrub

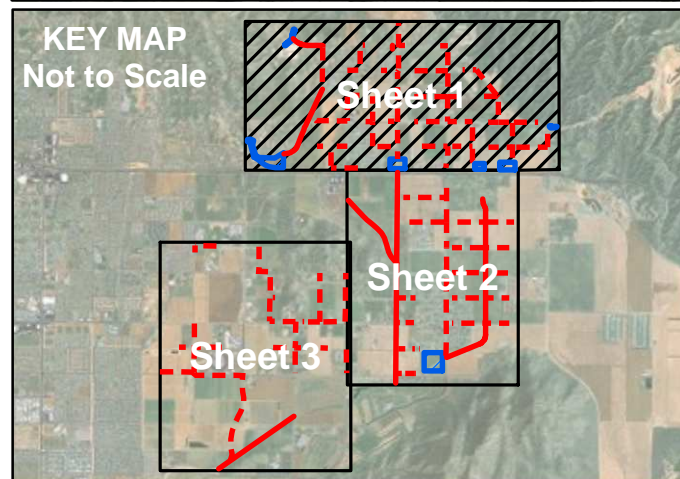
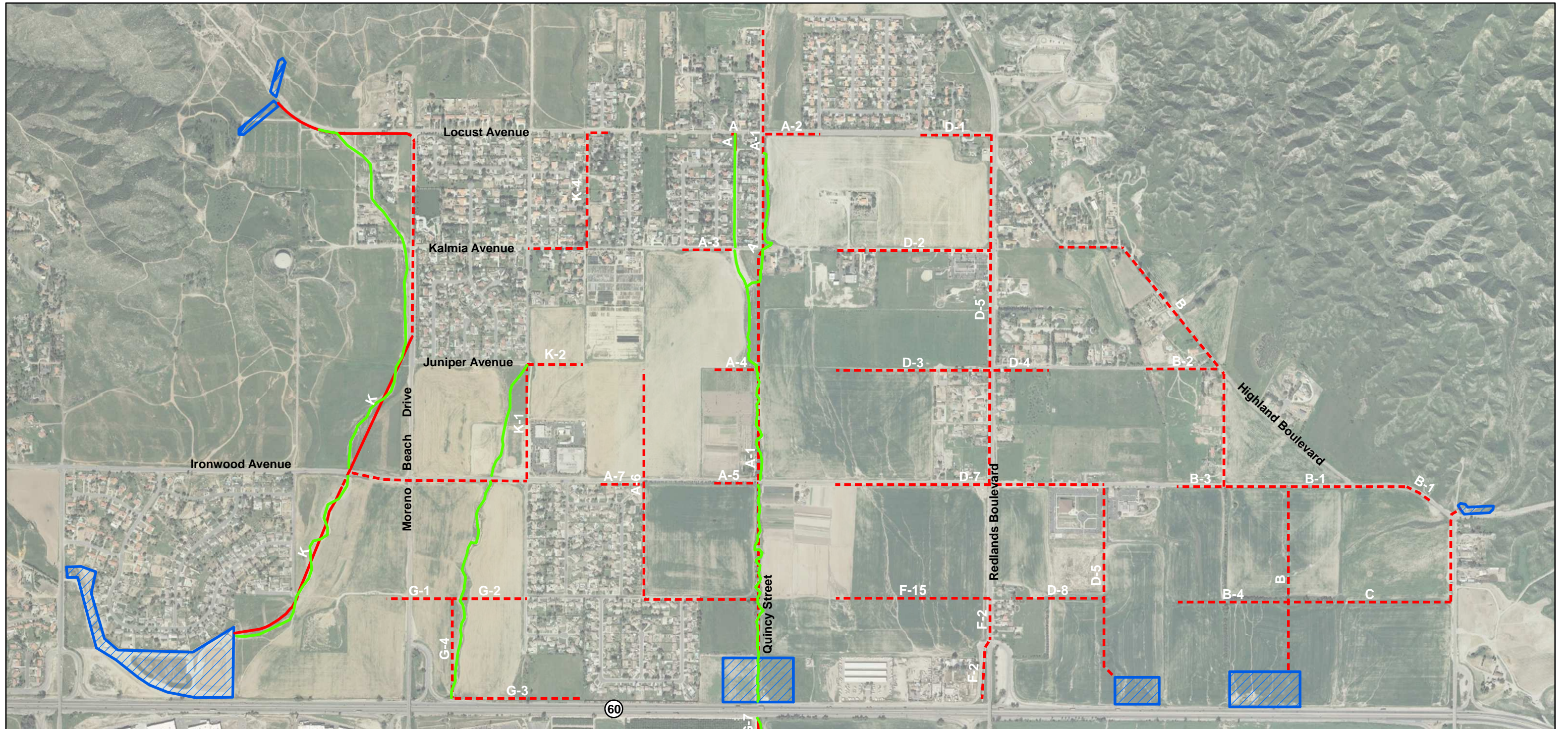


**MORENO VALLEY
MASTER DRAINAGE PLAN**
Vegetation Map

GLENN LUKOS ASSOCIATES



Exhibit 5 Sheet 3



Legend

- Proposed Open Channel
- - - Proposed Storm Drain
- Proposed Basin
- Potential Jurisdictional Feature



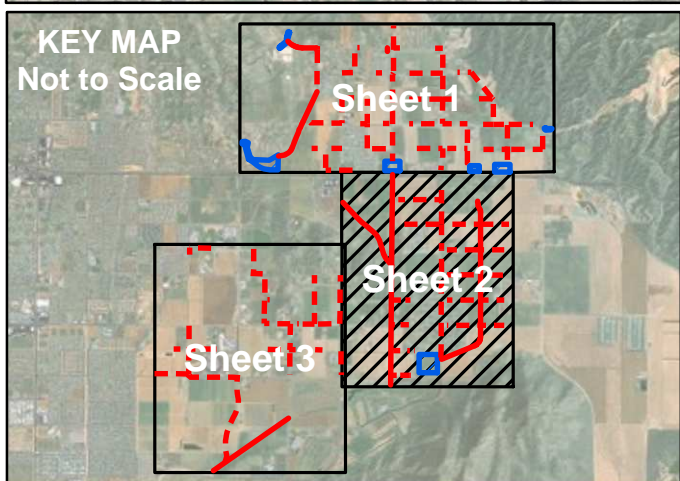
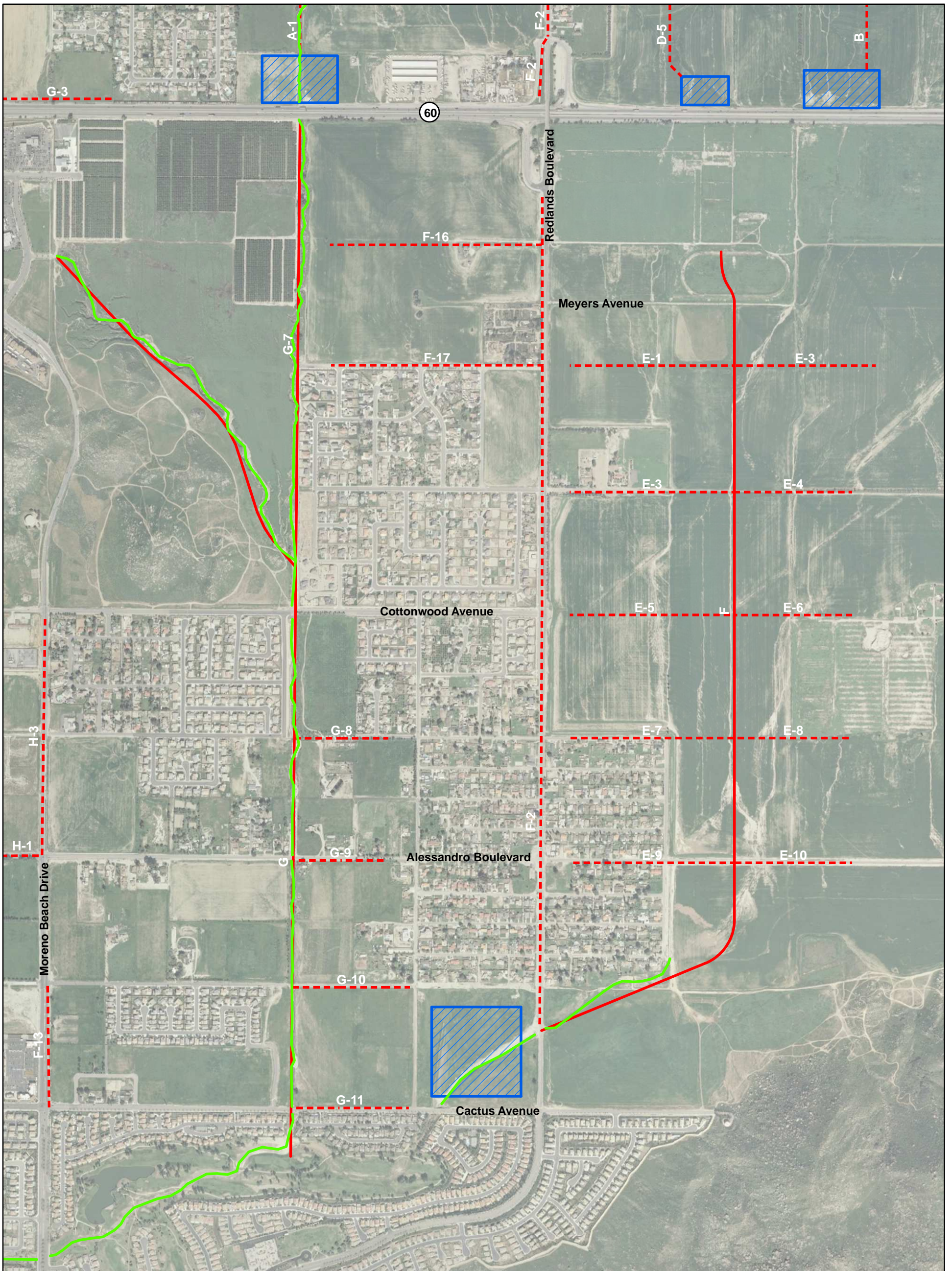
**MORENO VALLEY
MASTER DRAINAGE PLAN**

Potential Jurisdictional Features Map

GLENN LUKOS ASSOCIATES



Exhibit 7 Sheet 1



Legend

- Proposed Open Channel
- - - Proposed Storm Drain
- Proposed Basin
- Potential Jurisdictional Feature



**MORENO VALLEY
MASTER DRAINAGE PLAN**

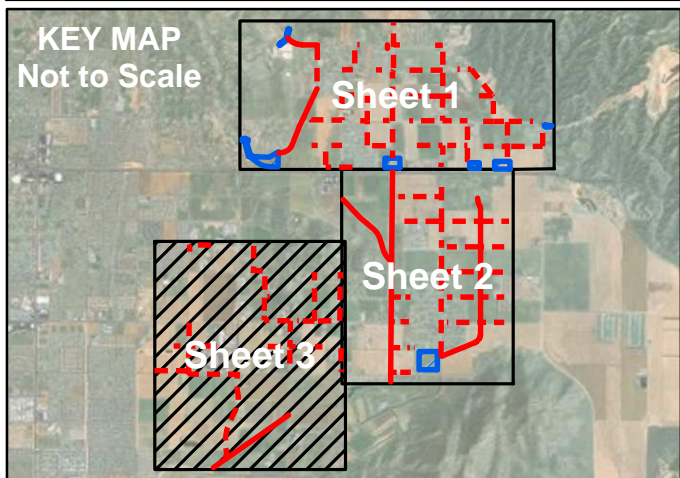
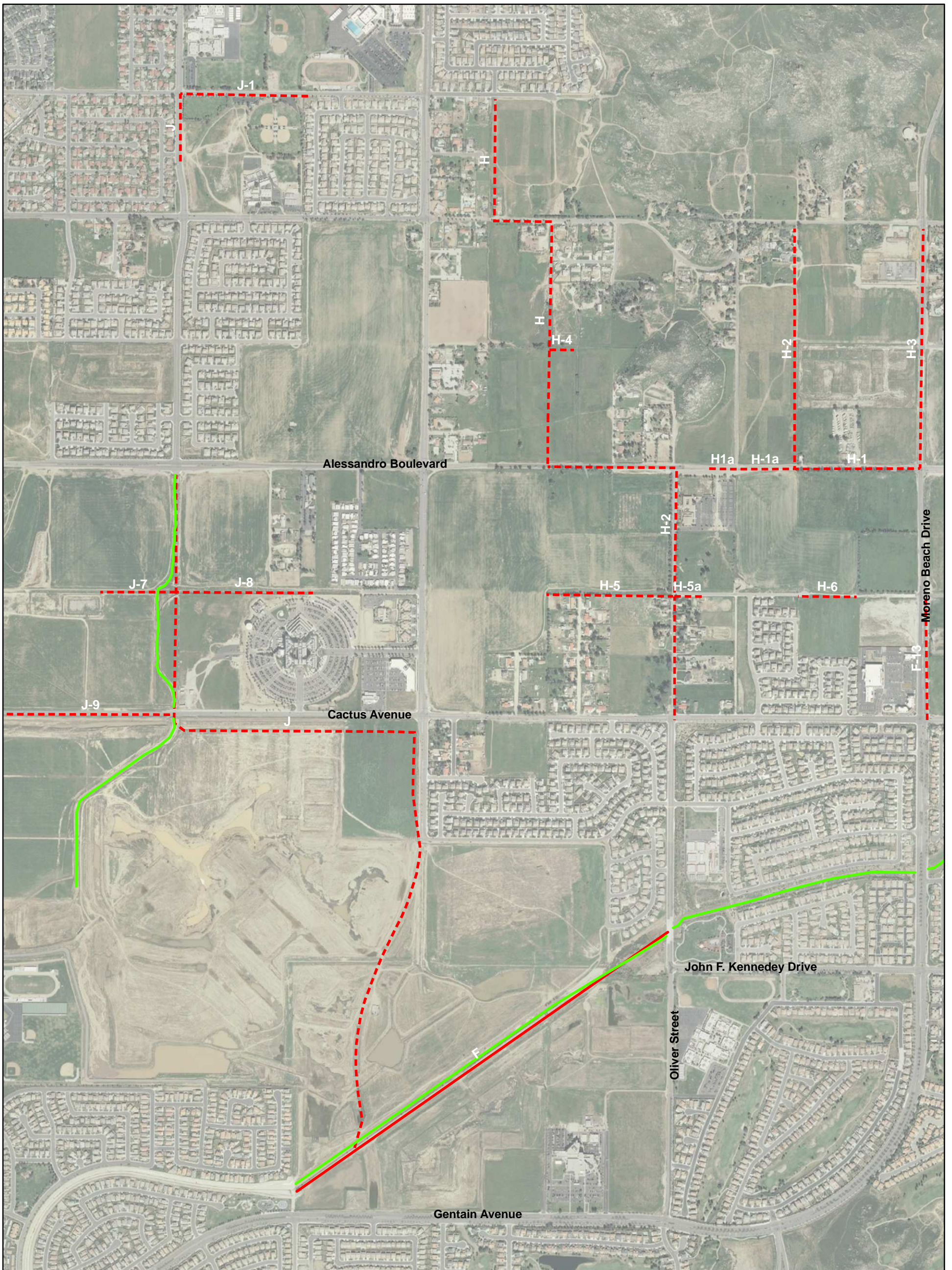
Potential Jurisdictional Features Map

GLENN LUKOS ASSOCIATES



Exhibit 7 Sheet 2





- Legend**
- Proposed Open Channel
 - - - Proposed Storm Drain
 - Proposed Basin
 - Potential Jurisdictional Feature



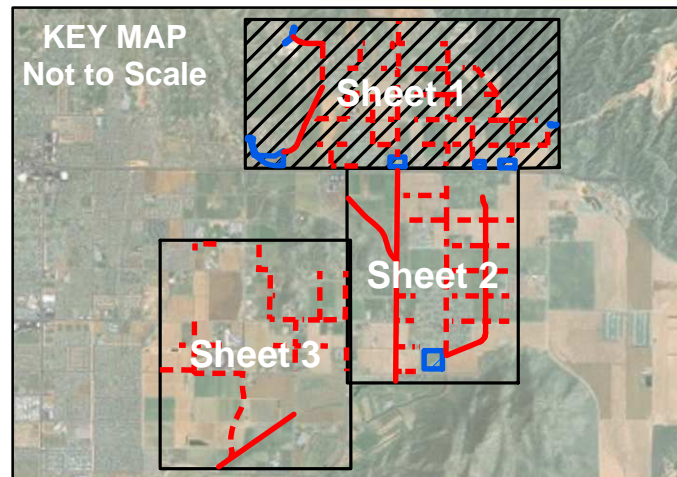
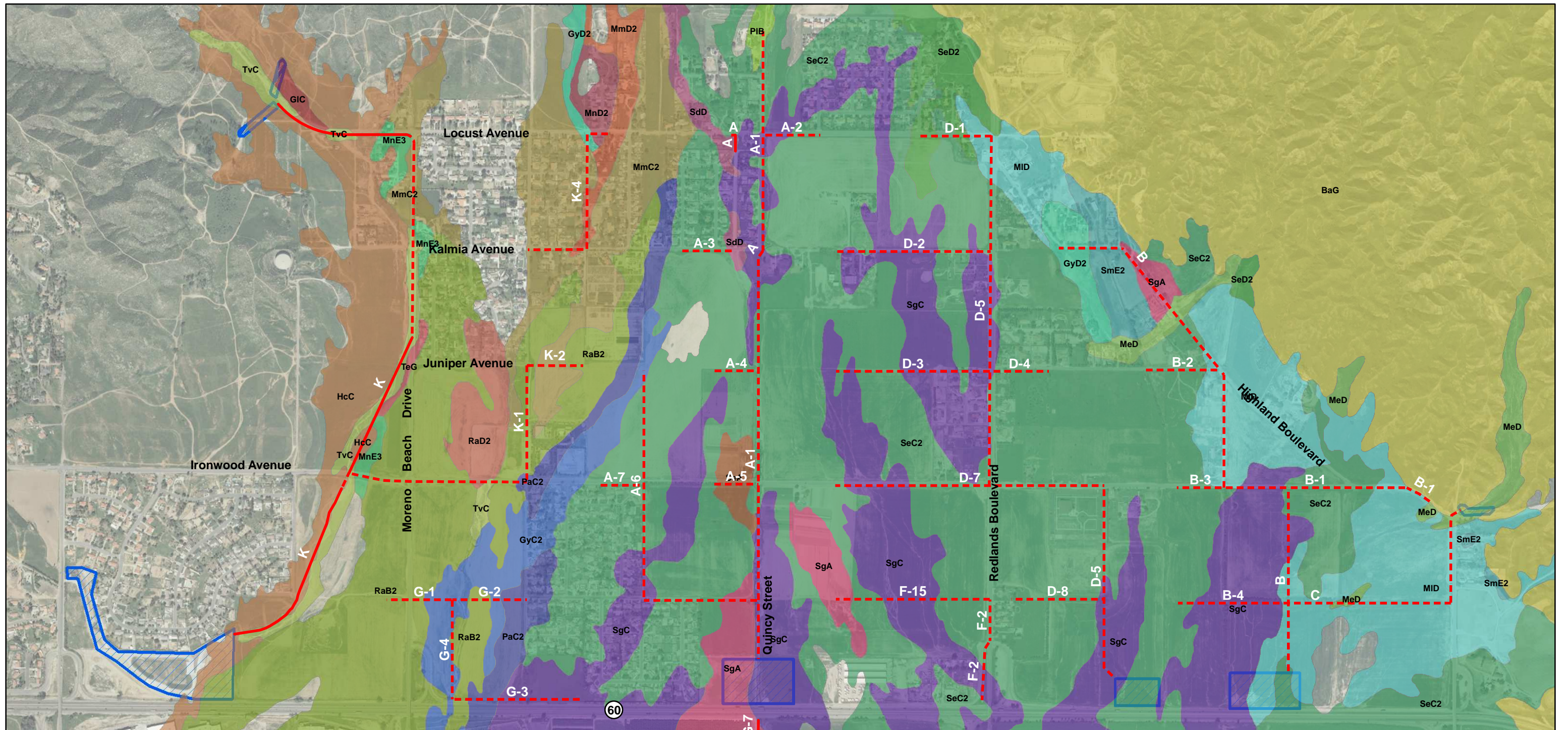
**MORENO VALLEY
MASTER DRAINAGE PLAN**

Potential Jurisdictional Features Map

GLENN LUKOS ASSOCIATES



Exhibit 7 Sheet 3

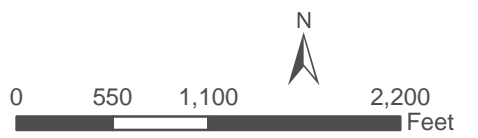


Legend

- Proposed Open Channel
- - - Proposed Storm Drain
- Proposed Basin
- BaG - Badland
- CkD2 - Cieneba rocky sandy loam, 8 to 15 percent slopes, eroded
- Du - Domino silt loam
- GIC - Gorgonio loamy sand, deep, 2 to 8 percent slopes
- GyA - Greenfield sandy loam, 0 to 2 percent slopes
- GyC2 - Greenfield sandy loam, 2 to 8 percent slopes, eroded
- GyD2 - Greenfield sandy loam, 8 to 15 percent slopes, eroded
- GzG - Gullied land
- HcC - Hanford coarse sandy loam, 2 to 8 percent slopes
- HcD2 - Hanford coarse sandy loam, 8 to 15 percent slopes, eroded
- MeD - Metz loamy sand, channeled, 0 to 15 percent slopes

- MfA - Metz loamy fine sand, 0 to 2 percent slopes
- MhB - Metz loamy fine sand, sandy loam substratum, 0 to 5 percent slopes
- MID - Metz gravelly sandy loam, 2 to 15 percent slopes
- MmC2 - Monserate sandy loam, 5 to 8 percent slopes, erode
- MmD2 - Monserate sandy loam, 8 to 15 percent slopes, eroded
- MnD2 - Monserate sandy loam, shallow, 5 to 15 percent slopes, eroded
- MnE3 - Monserate sandy loam, shallow, 15 to 25 percent slopes, severely eroded
- PaC2 - Pachappa fine sandy loam, 2 to 8 percent slopes, eroded
- PIB - Placentia fine sandy loam, 0 to 5 percent slopes
- RaA - Ramona sandy loam, 0 to 2 percent slopes
- RaB2 - Ramona sandy loam, 2 to 5 percent slopes, eroded
- RaB3 - Ramona sandy loam, 0 to 5 percent slopes, severely eroded
- RaC3 - Ramona sandy loam, 5 to 8 percent slopes, severely eroded
- RaD2 - Ramona sandy loam, 8 to 15 percent slopes, eroded

- ReC2 - Ramona very fine sandy loam, 0 to 8 percent slopes, eroded
- SdD - San Emigdio sandy loam, channeled, 2 to 15 percent slopes
- SeA - San Emigdio fine sandy loam, 0 to 2 percent slopes
- SeC2 - San Emigdio fine sandy loam, 2 to 8 percent slopes, eroded
- SeD2 - San Emigdio fine sandy loam, 8 to 15 percent slopes, eroded
- SgA - San Emigdio loam, 0 to 2 percent slopes
- SgC - San Emigdio loam, 2 to 8 percent slopes
- SmE2 - San Timoteo loam, 8 to 25 percent slopes, erode
- TeG - Terrace escarpments
- TvC - Tujunga loamy sand, channeled, 0 to 8 percent slopes
- W - Water
- Wf - Willows silty clay



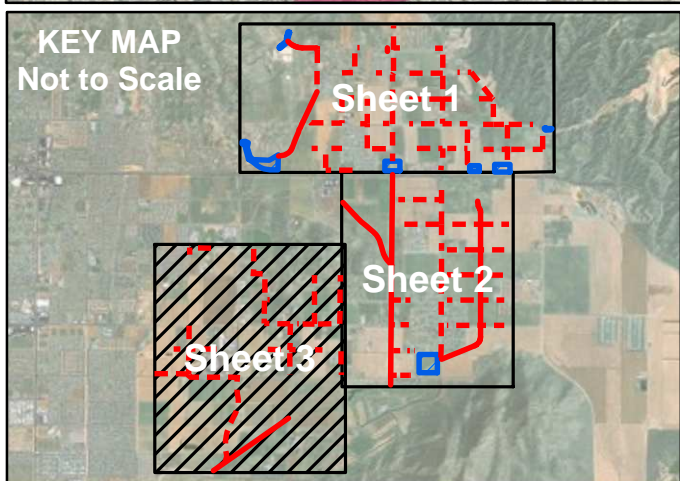
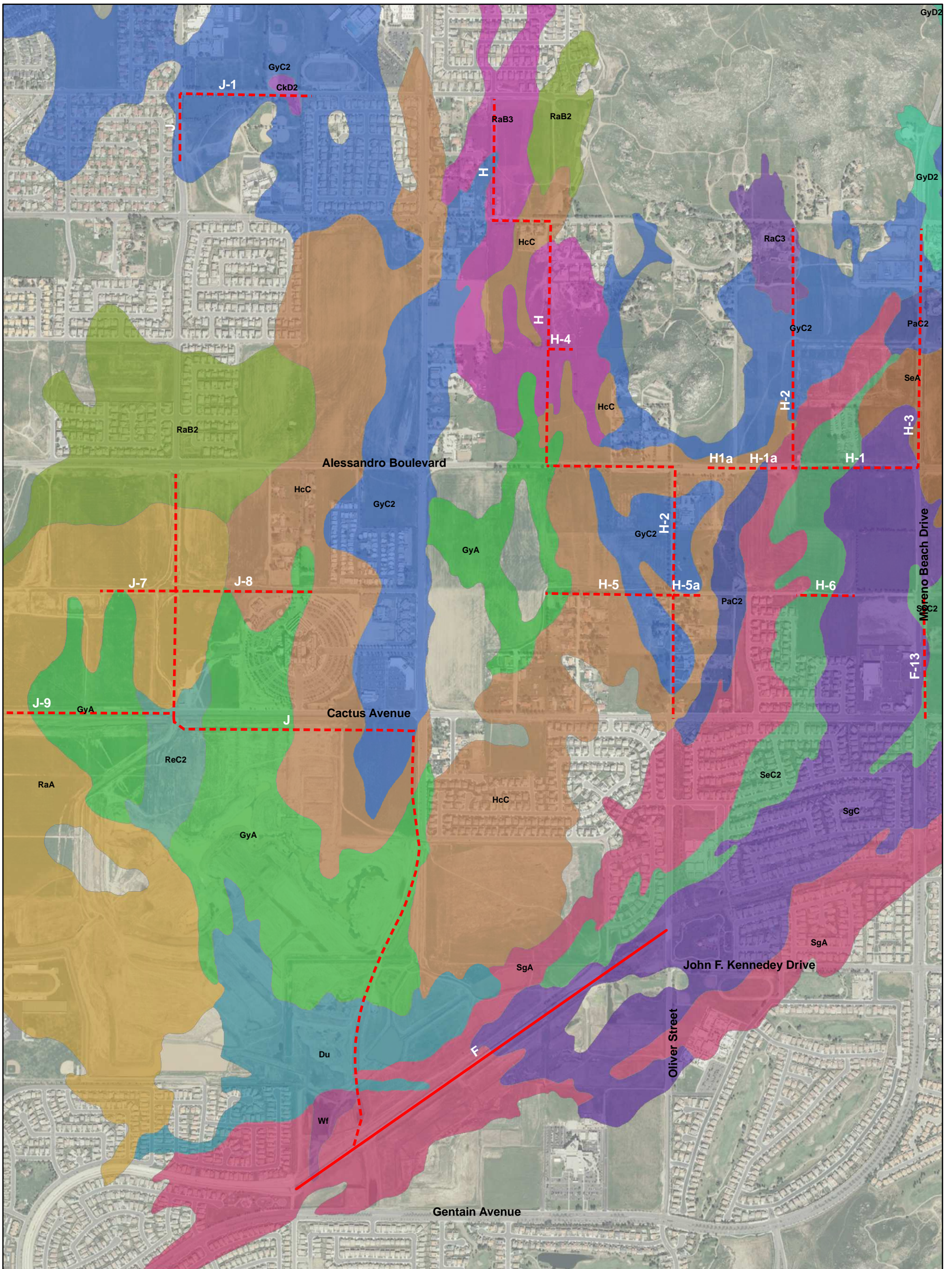
**MORENO VALLEY
MASTER DRAINAGE PLAN**

Soils Map

GLENN LUKOS ASSOCIATES



Exhibit 8 Sheet 1



Legend

- Proposed Open Channel
- - - Proposed Storm Drain
- Proposed Basin

Soils description see Exhibit 8 Sheet 1



**MORENO VALLEY
MASTER DRAINAGE PLAN**

Soils Map

GLENN LUKOS ASSOCIATES



Exhibit 8 Sheet 3



Appendix D.2

Paleontological Resources Assessment Report Moreno Master Drainage Plan Revision

PALEONTOLOGICAL RESOURCES ASSESSMENT REPORT
MORENO MASTER DRAINAGE PLAN REVISION

City of Moreno Valley
Riverside County, California

For Submittal to:

Riverside County Flood Control and Water Conservation District
1995 Market Street
Riverside, CA 92501

Prepared for:

Albert A. Webb Associates
3788 McCray Street
Riverside, CA 92506

Prepared by:

Harry M. Quinn, Paleontologist/Geologist
Deirdre Encarnación, Report Writer
CRM TECH
1016 E. Cooley Drive, Suite A/B
Colton, CA 92324

Michael Hogan, Principal Investigator
Bai "Tom" Tang, Principal Investigator

February 1, 2012

CRM TECH Contract #2564P
Approximately 60 Acres and 30 Linear Miles
USGS Sunnymead, Calif., 7.5' (1:24,000) Quadrangle
Various Sections, T2-3S R2-3W, San Bernardino Baseline and Meridian

MANAGEMENT SUMMARY

Between October 2011 and January 2012, at the request of Albert A. Webb Associates, CRM TECH performed a paleontological resource assessment on approximately 60 acres of vacant land and 30 miles of linear rights-of-way in the City of Moreno Valley, Riverside County, California. The project area for the study is generally located south of Vista Suelto Road, east of Lasselle Street, west of Theodore Street, and north of Iris Avenue, in various sections of T2-3S R2-3W, San Bernardino Baseline and Meridian. The study is part of the environmental review process for the proposed revisions to the previously adopted Moreno Master Drainage Plan, which call for the construction of open channels, storm drains, and basins. The Riverside County Flood Control and Water Conservation District (RCFCWCD), as the lead agency for the project, required the study in compliance with the California Environmental Quality Act (CEQA).

The purpose of the study is to provide the RCFCWCD with the necessary information and analysis to determine whether the proposed project would potentially impact or adversely affect any significant paleontological resources, as mandated by CEQA. In order to identify any paleontological resource localities that may exist in or near the project area and to assess the possibility for such resources to be encountered in future excavation and construction activities, CRM TECH initiated records searches at the San Bernardino County Museum and the Natural History Museum of Los Angeles County, conducted a literature search, and carried out a field survey of the project area, in accordance with the guidelines of the Society of Vertebrate Paleontology.

Based on the findings from these research procedures, the proposed project's potential to impact paleontological resources appears to range from low to high, depending on the soils impacted. The disturbed surface and near-surface soils on the valley floor, mainly Holocene in origin, are considered to be low in sensitivity for intact fossil resources, and will not require further paleontological investigations. The undisturbed Pleistocene-age sediments at depth, however, are of high paleontological sensitivity. If the depth at which the undisturbed Pleistocene-age sediments will be encountered—i.e., the thickness of Recent surficial alluvium—cannot be determined through existing data, such as boring logs, periodic monitoring will be necessary during excavations and other earth-moving activities reaching beyond three feet in depth. Once the buried Pleistocene-age sediments are encountered, continuous monitoring will become necessary as part of the paleontological resource impact mitigation program for this project.

TABLE OF CONTENTS

MANAGEMENT SUMMARY	i
INTRODUCTION	1
PALEONTOLOGICAL RESOURCES	3
Definition.....	3
Significance Criteria.....	3
Paleontological Sensitivity	3
SETTING	5
METHODS AND PROCEDURES.....	6
Records Searches	6
Literature Review.....	6
Field Survey	6
RESULTS AND FINDINGS.....	6
Records Searches	6
Literature Review.....	7
Field Survey	8
DISCUSSION	8
CONCLUSION AND RECOMMENDATIONS	9
REFERENCES.....	11
APPENDIX 1: PERSONNEL QUALIFICATIONS	13
APPENDIX 2: RECORDS SEARCHES RESULTS	17

LIST OF FIGURES

Figure 1. Project vicinity	1
Figure 2. Project area	2
Figure 3. Typical landscapes in the project area.....	5

INTRODUCTION

Between October 2011 and January 2012, at the request of Albert A. Webb Associates, CRM TECH performed a paleontological resource assessment on approximately 60 acres of vacant land and 30 miles of linear rights-of-way in the City of Moreno Valley, Riverside County, California (Fig. 1). The project area for the study is generally located south of Vista Suelto Road, east of Lasselle Street, west of Theodore Street, and north of Iris Avenue, in various sections of T2-3S R2-3W, San Bernardino Baseline and Meridian (Fig. 2). The study is part of the environmental review process for the proposed revisions to the previously adopted Moreno Master Drainage Plan, which call for the construction of open channels, storm drains, and basins. The Riverside County Flood Control and Water Conservation District (RCFCWCD), as the lead agency for the project, required the study in compliance with the California Environmental Quality Act (CEQA; PRC §21000, et seq.).

The purpose of the study is to provide the RCFCWCD with the necessary information and analysis to determine whether the proposed project would potentially impact or adversely affect any significant paleontological resources, as mandated by CEQA. In order to identify any paleontological resource localities that may exist in or near the project area and to assess the possibility for such resources to be encountered in future excavation and construction activities, CRM TECH initiated records searches at the San Bernardino County Museum and the Natural History Museum of Los Angeles County, conducted a literature search, and carried out a field survey of the project area, in accordance with the guidelines of the Society of Vertebrate Paleontology. The following report is a complete account of the methods, results, and final conclusion of this study.

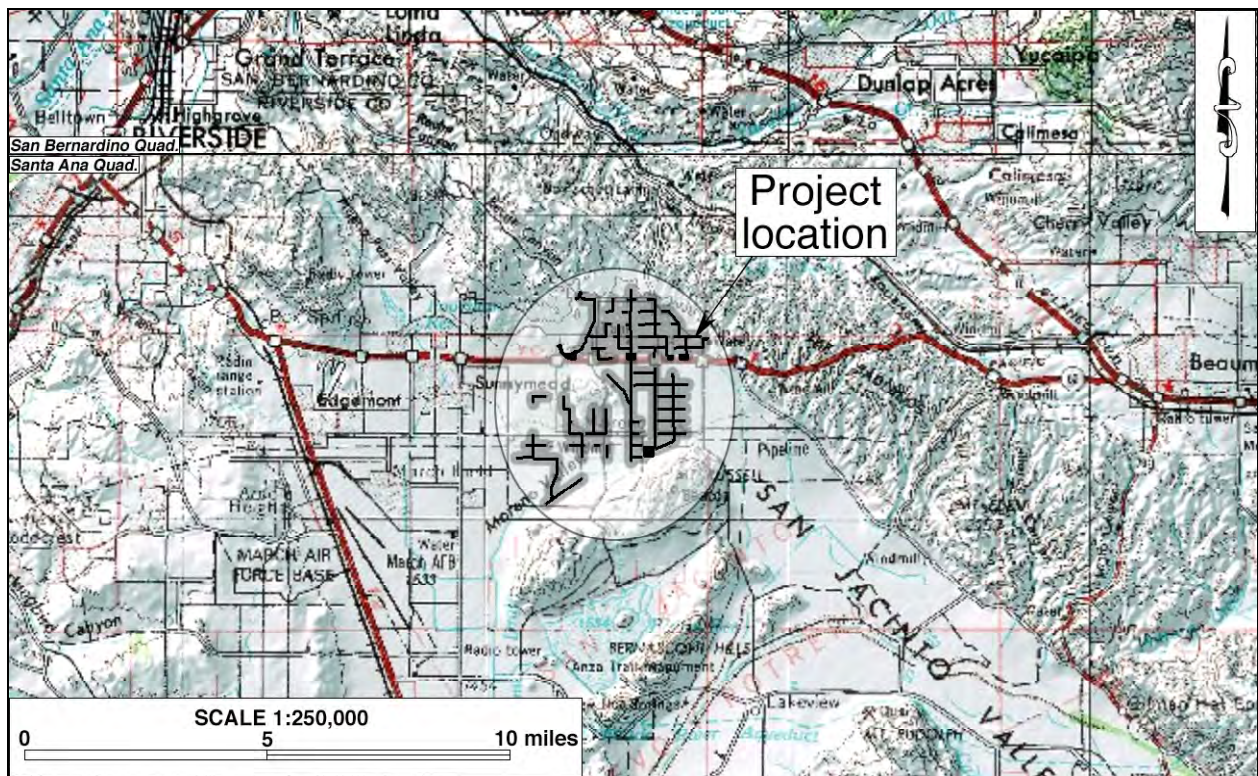


Figure 1. Project vicinity. (Based on USGS Santa Ana and San Bernardino, Calif., 1:250,000 quadrangles)

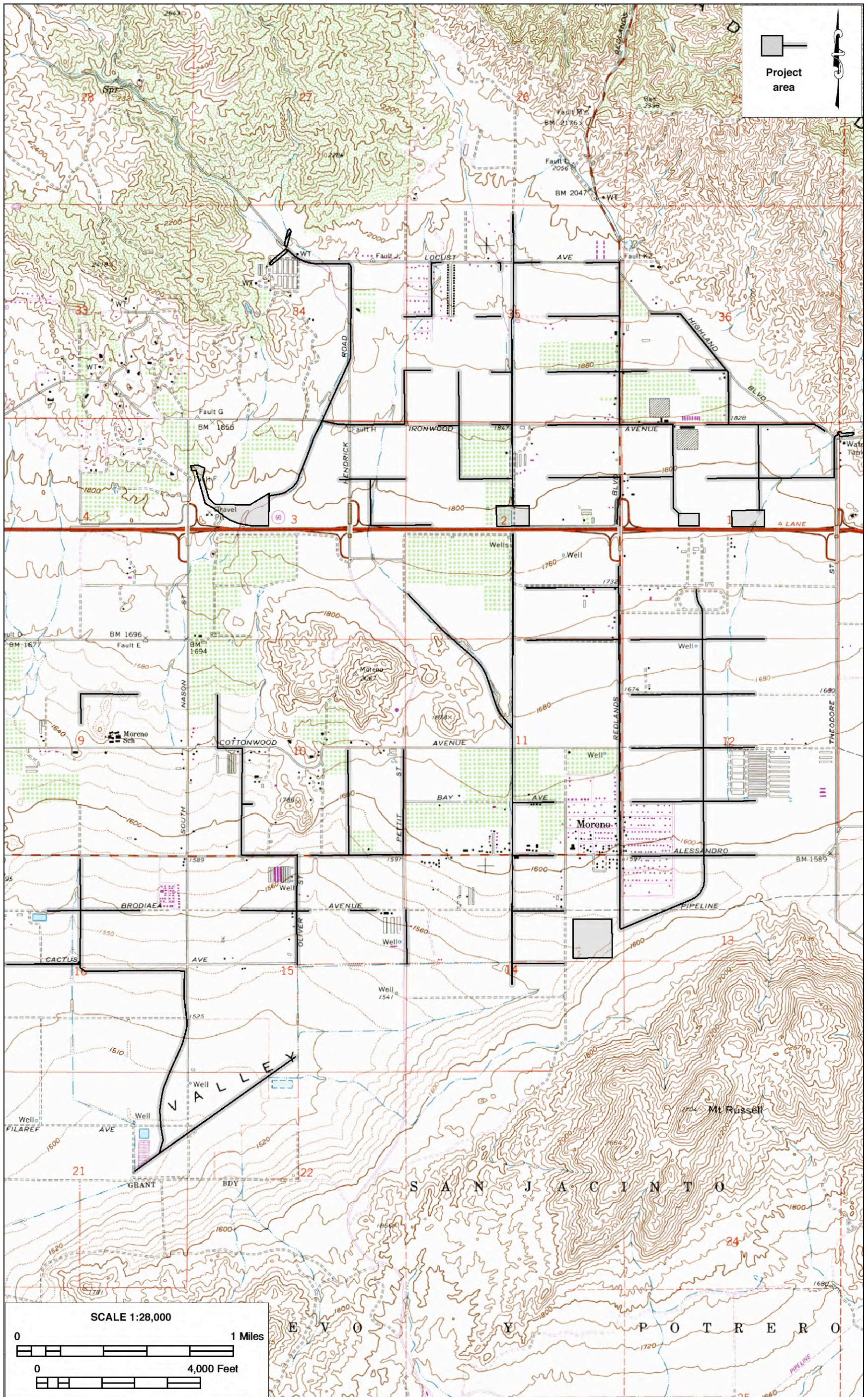


Figure 2. Project area. (Based on USGS Sunnymead, Calif., 1:24,000 quadrangle)

PALEONTOLOGICAL RESOURCES

DEFINITION

Paleontological resources represent the remains of prehistoric life, exclusive of any human remains, and include the localities where fossils were collected as well as the sedimentary formations in which they were found. The defining character of fossils or fossil deposits is their geologic age, which is typically regarded as older than 10,000 years, the generally accepted temporal boundary marking the end of the last late Pleistocene glaciation and the beginning of the current Holocene epoch.

Common fossil remains include marine shells; the bones and teeth of fish, reptiles, and mammals; leaf assemblages; and petrified wood. Fossil traces, another type of paleontological resource, include internal and external molds (impressions) and casts created by these organisms. These items can serve as important guides to the age of the rocks and sediments in which they are contained, and may prove useful in determining the temporal relationships between rock deposits from one area and those from another as well as the timing of geologic events.

Fossil resources generally occur only in areas of sedimentary rock (e.g., sandstone, siltstone, mudstone, claystone, or shale). Because of the infrequency of fossil preservation, fossils, particularly vertebrate fossils, are considered to be nonrenewable paleontological resources. Occasionally fossils may be exposed at the surface through the process of natural erosion or as a result of human disturbances; however, they generally lay buried beneath the surficial soils. Thus, the absence of surface fossils does not preclude the possibility of their being present within subsurface deposits, while the presence of fossils at the surface is often a good indication that more remains may be found in the subsurface.

SIGNIFICANCE CRITERIA

According to guidelines proposed by Eric Scott and Kathleen Springer of the San Bernardino County Museum, paleontological resources can be considered to be of significant scientific interest if they meet one or more of the following criteria:

1. The fossils provide information on the evolutionary relationships and developmental trends exhibited among organisms, living or extinct;
2. The fossils provide data useful in determining the age(s) of the rock unit or sedimentary stratum, including data important in determining the depositional history of the region and the timing of geologic events therein;
3. The fossils provide data regarding the development of biological communities or the interactions between paleobotanical and paleozoological biotas;
4. The fossils demonstrate unusual or spectacular circumstances in the history of life; and/or
5. The fossils are in short supply and/or in danger of being depleted or destroyed by the elements, vandalism, or commercial exploitation, and are not found in other geographic locations. (Scott and Springer 2003:6)

PALEONTOLOGICAL SENSITIVITY

The fossil record is unpredictable, and the preservation of organic remains is rare, requiring a particular sequence of events involving physical and biological factors. Skeletal

tissue with a high percentage of mineral matter is the most readily preserved within the fossil record; soft tissues not intimately connected with the skeletal parts, however, are the least likely to be preserved (Raup and Stanley 1978). For this reason, the fossil record contains a biased selection not only of the types of organisms preserved but also of certain parts of the organisms themselves. As a consequence, paleontologists are unable to know with certainty, the quantity of fossils or the quality of their preservation that might be present within any given geologic unit.

Sedimentary units that are paleontologically sensitive are those geologic units (mappable rock formations) with a high potential to contain significant nonrenewable paleontological resources. More specifically, these are geologic units within which vertebrate fossils or significant invertebrate fossils have been determined by previous studies to be present or are likely to be present. These units include, but are not limited to, sedimentary formations that contain significant paleontological resources anywhere within their geographical extent as well as sedimentary rock units temporally or lithologically amenable to the preservation of fossils.

A geologic formation is defined as a stratigraphic unit identified by its lithic characteristics (e.g., grain size, texture, color, and mineral content) and stratigraphic position. There is a direct relationship between fossils and the geologic formations within which they are enclosed, and with sufficient knowledge of the geology and stratigraphy of a particular area, it is possible for paleontologists to reasonably determine its potential to contain significant nonrenewable vertebrate, invertebrate, marine, or plant fossil remains.

The paleontological sensitivity for a geologic formation is determined by the potential for that formation to produce significant nonrenewable fossils. This determination is based on what fossil resources the particular geologic formation has produced in the past at other nearby locations. Determinations of paleontologic sensitivity must consider not only the potential for yielding vertebrate fossils but also the potential for a few significant fossils that may provide new and significant taxonomic, phylogenetic, and/or stratigraphic data.

The Society of Vertebrate Paleontology (1995:22-27) issued a set of standard guidelines intended to assist paleontologists to assess and mitigate any adverse effects/impacts to nonrenewable paleontological resources. The Society defined three potential categories of paleontological sensitivity for geologic units that might be impacted by a proposed project. These categories are described below, along with the criteria used to establish their sensitivity.

- **High sensitivity:** Geologic units assigned to this category are considered to have a high potential for significant nonrenewable vertebrate, invertebrate, marine, or plant fossils. Sedimentary rock units in this category contain a relatively high density of recorded fossil localities, have produced fossil remains in the vicinity, and are very likely to yield additional fossil remains.
- **Low sensitivity:** Geologic units are assigned to this category when they have produced no or few recorded fossil localities and are not likely to yield any significant nonrenewable fossil remains.
- **Undetermined sensitivity:** Geologic units are assigned to this category when there is limited exposure of the rock units in the area and/or the rock units have been poorly studied.

SETTING

The project area is located on the eastern edge of the City of Moreno Valley, which occupies much of an inland valley bearing the same name. It extends across the level plains of the valley floor from the southern base of the San Timoteo Badlands, a series of broken hills interspersed with numerous erosional channels, to the northern slope of Mount Russell, an isolated granitic knoll, at elevations ranging around 1,500-1,960 feet above mean sea level. The climate and environment of the surrounding area are typical of the southern California inland valleys, featuring an average annual rainfall of less than 12 inches and temperatures that reach over 100 degrees Fahrenheit in summer and near freezing in winter.

The Moreno Valley lies in the northern portion of the Peninsular Ranges province, and constitutes a part of an eroded mass of Cretaceous and older crystalline rock known as the Perris Block. The Peninsular Ranges province is bounded on the north by the Transverse Ranges province, on the northeast by the Colorado Desert province, and on the west by the Pacific Ocean (Jenkins 1980:40-41; Harms 1996:150). It extends southward to the southern tip of Baja California (Jahns 1954).

The Perris Block was defined by English (1926) as a region between the San Jacinto and Elsinore-Chino fault zones, bounded on the north by the Cucamonga (San Gabriel) Fault and on the south by a vaguely delineated boundary near the southern end of the Temecula Valley. This structural block is located in the northern portion of the Peninsular Ranges province (Jenkins 1980:40-41; Harms 1996:150) and is considered to have been active since Pliocene times (Woodford et al. 1971:3421). The Pliocene- and Pleistocene-age non-marine sedimentary rocks found filling the valley areas within the Perris Block have produced a few vertebrate fossils, as well as a few invertebrate fossil remains (Mann 1955:13).

The project area lies within both paved roadways and open fields in a rapidly urbanizing former agricultural area (Fig. 3). Soils in the vicinity consist of grayish-brown, medium-grained sands with some decomposing granite near the hills and boulder outcrops. Past developments have removed almost all traces of the native landscape along the roadways, but some native vegetation was observed in the fields that have not been used for agriculture. Vegetation noted near the roadways consists mostly of introduced



Figure 3. Typical landscapes within the project area. *Left*: agricultural field at a proposed basin site; *right*: drainage right-of-way along an existing roadway. (Photos taken on November 2-3, 2011)

landscaping plants, while the rest of the project area hosts scattered growths of tumbleweeds, wild mustards, cottonwood, datura, and the typical small grasses and shrubs (Fig. 3).

METHODS AND PROCEDURES

RECORDS SEARCHES

The records search service was provided by the San Bernardino County Museum in Redlands and the Natural History Museum of Los Angeles County in Los Angeles. These institutions maintain files of regional paleontological localities as well as supporting maps and documents. The records search results were used to identify known paleontological localities in or near the project area, or in the general vicinity.

LITERATURE REVIEW

In addition to the records searches, a literature search was conducted using materials in the CRM TECH library, including unpublished reports produced during surveys of other properties in the area, and the personal library of CRM TECH geologist/paleontologist Harry M. Quinn, California Professional Geologist #3477 (see App. 1 for qualifications).

FIELD SURVEY

On October 27, November 1-3, and November 8, 2011, CRM TECH paleontological surveyors Daniel Ballester and Robert Porter (see App. 1 for qualifications) conducted the field survey of the project area under the direction of Harry M. Quinn. Since the proposed drainage alignments are mostly confined within the heavily disturbed rights-of-way of various existing public roadways, most of the survey was conducted at a reconnaissance level by driving along the project routes and visually inspecting the surrounding ground surface for any indications of potential paleontological resources.

Along drainage alignments lying outside the existing roadway rights-of-way and at the proposed basin sites, a more intensive survey was conducted on foot by walking parallel transects spaced 15 meter (approx. 50 feet) apart. In this way, the ground surface in the entire project area was systematically and carefully examined to determine the soil types, to verify the geological formations, and to look for any indications of paleontological remains. Since much of the project area lies under road pavement, visibility of the native ground surface was generally poor, but was excellent (95%) in areas of cleared and unpaved land.

RESULTS AND FINDINGS

RECORDS SEARCHES

The Natural History Museum of Los Angeles County and the San Bernardino County Museum found no known paleontological localities within the project area or within a one-mile radius (McLeod 2011; Scott 2012; see App. 2). However, paleontological localities

have been reported nearby from sediment lithologies similar to those known to occur at this location (McLeod 2011). The Natural History Museum of Los Angeles County identified the surficial deposits in the project area as younger and older Quaternary coarse fan deposits, with some of the younger Quaternary fluvial deposits (*ibid.*:1). Typically, these sedimentary deposits do not contain significant fossil remains within the uppermost layers, but they may overlie older Quaternary deposits that could contain significant vertebrate fossil remains (*ibid.*).

The San Bernardino County Museum concluded that the project area is situated mostly upon Pleistocene-age alluvial fan deposits overlain by Holocene alluvium (Scott 2012:1). While the Holocene alluvium is known to have a low paleontological sensitivity, the Pleistocene fan deposits, depending upon their lithology, may have a high potential to contain paleontological resources, as demonstrated by the discovery of fossil remains of extinct animals from the Ice Age elsewhere in the region (*ibid.*). Therefore, the museum concludes that excavations into the older Pleistocene deposits have a "high potential to impact paleontologic resources" (*ibid.*:2).

LITERATURE REVIEW

The surface geology within the project area was mapped by Rogers (1965) as *Qal*, or alluvium of Holocene age. Dibblee (2003) mapped the surface geology of the project area in more detail and found most of the outcropping rocks to be Holocene in age, but did map a small amount of Pleistocene-age alluvial fan deposits in the northern portion of the project area and adjacent to some of the granitic rock outcrops. While this map was issued in 2003, the field geologic mapping was conducted many years earlier. The surface geology of the area, according to Dibblee (2003) consists of the following geologic units: *qdx* (xenolith rich quartz diorite), *Qoa* (Pleistocene-age alluvium), *Qa* (Holocene-age alluvium), and *Qg* (Holocene-age alluvial sand and gravel of major stream channels). Specific findings at different portions of the project area are presented below in Table 1.

Location	Dibblee 2003	Morton and Matti 2001
Drainage alignments		
Section 34, T2S R3W	<i>qdx</i> , <i>Qoa</i> , and <i>Qa</i>	Granitic rock, <i>Qvofa</i> , <i>Qofag</i> , and <i>Qyfag</i>
Sections 35 & 36, T2S R3W	<i>Qa</i>	<i>Qyfag</i> , <i>Qofag</i> , and <i>Qyofa</i>
Section 1, T3S R3W	<i>Qa</i>	<i>Qyfa</i> , <i>Qyfag</i> , and some <i>Qofag</i>
Section 2, T3S R3W	<i>Qa</i> , <i>qdx</i> , and <i>Qoa</i>	<i>Qyfag</i> with some <i>Qyofag</i> and granitic rock
Section 3, T3S R3W	<i>Qa</i> , <i>qdx</i> , and <i>Qoa</i>	Granitic rock with some <i>Qyofa</i> and <i>Qyfag</i>
Section 9, T3S R3W	<i>Qa</i> , <i>qdx</i> , and <i>Qoa</i>	<i>Qvofa</i> with some granitic rock
Section 10, T3S R3W	<i>Qa</i> , <i>qdx</i> , and <i>Qoa</i>	Granitic rock, <i>Qvofa</i> , <i>Qyfa</i> , and <i>Qyfag</i>
Section 11, T3S R3W	<i>Qa</i> , <i>qdx</i> , and <i>Qoa</i>	<i>Qyfag</i> with some <i>Qvofa</i> and granitic rock
Section 12, T3S R3W	<i>Qa</i>	<i>Qyfag</i>
Sections 13-16, T3S R3W	<i>Qa</i> , <i>qdx</i> , and <i>Qoa</i>	<i>Qyfag</i> with some <i>Qvofa</i>
Sections 21 & 22, T3S R3W	<i>Qa</i> , <i>qdx</i> , and <i>Qoa</i>	<i>Qyva</i> ; possibly some <i>Qvofa</i> in the southernmost portion
Dike sites, Section 34, T2S R3W		
Northern dike	<i>Qa</i> and <i>Qg</i>	<i>Qyfa</i>
Southern dike	<i>Qa</i> and <i>Qoa</i>	<i>Qyfa</i> and <i>Qvofa</i>
Basin sites		
Sections 1 & 2, T3S R3W	<i>Qa</i>	<i>Qyfag</i>
Section 3, T3S R3W	<i>Qoa</i> , <i>Qg</i> , and granitic rock	<i>Qvofa</i> , <i>Qyaa</i> , <i>Qyfag</i> , with some granitic rock
Section 14, T3S R3W	<i>Qa</i> ; <i>Qoa</i> in southern portion	<i>Qyva</i> ; <i>Qvofa</i> in southern portion

Morton and Matti (2001) re-categorized many of the Holocene sediments, as mapped by most of the earlier geologists, to Pleistocene in age. They mapped the area as mainly *Qyfa* and *Qyfag* of Holocene to late Pleistocene age. Second in abundance are *Qvofa* and *Qofag* of Pleistocene age. Some *Qyva* (young alluvial valley deposits, Holocene and late Pleistocene) and *Qyaa* (young alluvial wash deposits, Holocene and late Pleistocene) are also noted, as shown in Table 1.

Knecht (1971:General Soils Map) mapped the surface soils in the project area as mainly Type 5 and Type 7 with a minor amount of Type 3 in the northwestern portion. The Type 5 soils contain the Hanford, Arlington, and Exeter Series that commonly form on alluvial fans and flood plains. The Type 7 soils contain the San Emigdio, Grangeville, and Metz Series that also form on alluvial fans and flood plains, but these soils commonly feature a surface layer of calcareous loamy sand to loam. The Type 3 soils contain the Cieneba-Rock and Fallbrook associations, which develop in areas of granitic rock.

It is worth noting that some sources suggest that a possible ancestral San Jacinto River channel once ran northwest from Mystic Lake, around the northern base of the Lakeview Mountains, and then south to the Perris area. The course of this river channel would have passed through the southern portion of this project area. It was probably the same Pleistocene-age river channel in which a Mammoth tusk was found just east of the March Air Reserve Base a few years ago (Knoll 2009).

As mentioned above, the project area lies mostly upon Pleistocene-age alluvial fan deposits overlain by Holocene alluvium. The thickness of the Holocene alluvial material is unknown. However, the primary author of this report once participated in a seismic investigation in or near the southeast quarter of Section 2, T3S R3W, which included fault trenching to the depth of eight to ten feet below grade. No fossil remains were found in the trench, but a soil color change was noted around the depth of six to seven feet, which may have marked the Pleistocene-Holocene boundary.

FIELD SURVEY

The field survey produced negative results for any indication of potential paleontological resources, and no surficial evidence of fossil remains was observed within or adjacent to the project area. Surface soils were found to consist of grayish-brown medium-grain sands, as noted above, and almost the entire project area has been disturbed in the past by agricultural and construction activities. Decomposing granite was observed exposed near the hills and boulder outcrops.

DISCUSSION

Based on the research results outlined above, the project area lies mainly upon alluvial fan deposits. While these deposits are for the most part of Holocene age, they rest directly atop older sediments of Pleistocene age at some unknown depth. The older Pleistocene-age alluvial fan deposits are known to be sensitive for paleontological resources, but have proven to be less fossiliferous than the Pleistocene-age riverbed and lakeshore deposits, such as those along the possible ancestral San Jacinto River channel across the southern portion of the project area. Therefore, that area is given a higher potential to contain

significant nonrenewable paleontological remains that the rest of the project area. However, until additional information is amassed, all Pleistocene-age alluvial fan deposits in the project area must be considered paleontologically sensitive in accordance with the conclusions of the Natural History Museum of Los Angeles County and the San Bernardino County Museum.

The geologic maps show some Pleistocene-age sediments to outcrop in the northern, western, and southern portions of the project area, but all of these appear to be alluvial fan deposits. Should geotechnical boring logs be available, they may reveal the thickness of these younger surface sediments. If no logs are available or if the logs do not show a definitive break in the stratigraphy, periodic field inspections will be necessary during the project to determine the depth at which the older Pleistocene-age sediments will be encountered.

Most of the ground surface in the project area has been farmed or otherwise disturbed in the past. Because of the disturbances, generally speaking, the top two to three feet of soils would not contain any intact fossil remains. In the portions of the project area along existing roadways, the upper three to five feet of sediments may have been disturbed. Any further paleontological investigations will need to focus on the undisturbed Pleistocene-age sediments at depth.

CONCLUSION AND RECOMMENDATIONS

CEQA Appendix G provides that "a project may be deemed to have a significant effect on the environment if it will ... disrupt or adversely affect a ... paleontological site except as a part of a scientific study." The present study, conducted in compliance with this provision, is designed to identify any significant, non-renewable paleontological resources that may exist within or adjacent to the project area, and to assess the possibility for such resources to be encountered in future excavation and construction activities.

As stated above, the proposed project's potential to impact paleontological resources appears to range from low to high, depending on the soils impacted. The disturbed surface and near-surface soils on the valley floor, mainly Holocene in origin, are considered to be low in sensitivity for intact fossil resources, and will not require further paleontological investigations. The undisturbed Pleistocene-age sediments at depth, however, are of high paleontological sensitivity.

If the depth at which the undisturbed Pleistocene-age sediments will be encountered—i.e., the thickness of Recent surficial alluvium—cannot be determined through existing data, such as boring logs, periodic monitoring will be necessary during excavations and other earth-moving activities reaching beyond three feet in depth. Once the buried Pleistocene-age sediments are encountered, continuous monitoring will become necessary as part of the paleontological resource impact mitigation program for this project.

The mitigation program should be developed in accordance with the provisions of CEQA as well as with regulations currently implemented by the County of Riverside and the proposed guidelines of the Society of Vertebrate Paleontology. It should include, but not be limited to the following:

1. The excavation of areas identified as likely to contain paleontologic resources, such as any undisturbed subsurface older alluvium, should be monitored by a qualified paleontological monitor. The monitor should be prepared to quickly salvage fossils, if they are unearthed, to avoid construction delays, but must have the power to temporarily halt or divert construction equipment to allow for removal of abundant or large specimens.
2. Samples of sediments should be collected and washed to recover small invertebrate and vertebrate fossils.
3. Recovered specimens should be identified and curated at a repository with permanent retrievable storage that would allow for further research in the future.
4. A report of findings, including, when appropriate, an itemized inventory of recovered specimens and a discussion of their significance, should be prepared upon completion of the steps outlined above. The report and inventory, when submitted to the appropriate lead agency, would signify completion of the program to mitigate impacts on paleontologic resources.

REFERENCES

- Dibblee, Thomas W., Jr.
2004 Geologic Map of the Sunnymead/South Half of Redlands Quadrangles, Riverside County, California. Dibblee Geology Center Map #DF-110. Santa Barbara, California.
- English, W. A.
1926 *Geology and Oil Resources of the Puente Hills Region, Southern California*. U.S. Geological Survey Bulletin 146. Washington D.C.
- Harms, Nancy S.
1996 *A Precollegiate Teachers Guide to California Geomorphic/Physiographic Provinces*. Far West Section, National Association of Geoscience Teachers, Concord, California.
- Jahns, R. H.
1954 Geology of the Peninsular Range Province, Southern California and Baja California. In R. H. Jahns (ed.): *Geology of Southern California*; Chapter II. California Division of Mines Bulletin 170, Part 3. San Francisco.
- Jenkins, Olaf P.
1980 Geomorphic Provinces Map of California. *California Geology* 32(2):40-41. California Division of Mines and Geology, Sacramento.
- Knecht, Arnold A.
1971 *Soil Survey of Western Riverside Area, California*. U.S. Department of Agriculture, Soil Conservation Service, Washington, D.C.
- Knoll, Corina
2009 Plumber Finds Prehistoric Tusk in Riverside County. *Los Angeles Times*, January 21.
- Mann, John F., Jr.
1955 *Geology of a Portion of the Elsinore Fault Zone, California*. California Division of Mines Special Report 43. San Francisco.
- McLeod, Samuel A.
2011 Paleontological Resources for the Proposed Moreno Valley Master Drainage Plan Project, CRM TECH #2564P, in the City of Moreno Valley Riverside County, Project Area. Letter report prepared by the Natural History Museum of Los Angeles County, Vertebrate Paleontology Section, Los Angeles.
- Morton, Douglas M., and Jonathan C. Matti
2001 Geologic Map of the Sunnymead 7.5' Quadrangle, Riverside County, California. U.S. Geological Survey Open-File Report 01-450. U.S. Geological Survey, Menlo Park, California.
- Raup, David M., and Steven M. Stanley
1978 *Principle of Paleontology*. W. H. Freeman and Company, San Francisco.

Rogers, Thomas H.

1965 Geological Map of California, Santa Ana Sheet (1:250,000). California Division of Mines and Geology, Sacramento.

Scott, Eric

2012 Paleontology Records Review, Moreno Valley Master Drainage Plan, City of Moreno Valley, Riverside County, California. Letter report prepared by the San Bernardino County Museum, Section of Geological Sciences, Redlands, California.

Scott, Eric, and Kathleen Springer

2003 CEQA and Fossil Preservation in California. *Environmental Monitor* Fall:4-10. Association of Environmental Professionals, Sacramento, California.

Society of Vertebrate Paleontology

1995 Assessment and Mitigation of Adverse Impacts to Nonrenewable Paleontologic Resources: Standard Guidelines. *Society of Vertebrate Paleontology News Bulletin* 163:22-27.

Woodford, Alfred O., John S. Shelton, Donald O. Doehring, and Richard K. Morton

1971 Pliocene-Pleistocene History of the Perris Block, Southern California. *Geological Society of America Bulletin* 82(12):3421-3448.

APPENDIX 1

PERSONNEL QUALIFICATIONS

PROJECT GEOLOGIST/PALEONTOLOGIST
Harry M. Quinn, M.S.

Education

1968 M.S., Geology, University of Southern California, Los Angeles, California.
1964 B. S, Geology, Long Beach State College, Long Beach.
1962 A.A., Los Angeles Harbor College, Wilmington North Palm Springs, California.

- Graduate work oriented toward invertebrate paleontology; M.S. thesis completed as a stratigraphic paleontology project on the Precambrian and Lower Cambrian rocks of Eastern California.

Professional Experience

2000- Project Paleontologist, CRM TECH, Riverside/ Colton, California.
1998- Project Archaeologist, CRM TECH, Riverside/ Colton, California.
1992-1998 Independent Geological/Geoarchaeological/ Environmental Consultant, Pinyon Pines, California.
1994-1996 Environmental Geologist, E.C E.S., Inc, Redlands, California.
1988-1992 Project Geologist/ Director of Environmental Services, STE, San Bernardino, California.
1987-1988 Senior Geologist, Jirsa Environmental Services, Norco, California.
1986 Consulting Petroleum Geologist, LOCO Exploration, Inc. Aurora, Colorado.
1978-1986 Senior Exploration Geologist, Tenneco Oil E & P, Englewood, Colorado.
1965-1978 Exploration and Development Geologist, Texaco, Inc., Los Angeles, California.

Previous Work Experience in Paleontology

1969-1973 Attended Texaco company-wide seminars designed to acquaint all paleontological laboratories with the capability of one another and the procedures of mutual assistance in solving correlation and paleo-environmental reconstruction problems.
1967-1968 Attended Texaco seminars on Carboniferous coral zonation techniques and Carboniferous smaller foraminifera zonation techniques for Alaska and Nevada.
1966-1972, 1974, 1975 Conducted stratigraphic section measuring and field paleontological identification in Alaska for stratigraphic controls. Pursued more detailed fossil identification in the paleontological laboratory to establish closer stratigraphic controls, mainly with Paleozoic and Mesozoic rocks and some Tertiary rocks, including both megafossil and microfossil identification, as well as fossil plant identification.
1965 Conducted stratigraphic section measuring and field paleontological identification in Nevada for stratigraphic controls. Pursued more detailed fossil identification in the paleontological laboratory to establish closer stratigraphic controls, mainly with Paleozoic rocks and some Mesozoic and Tertiary rocks. The Tertiary work included identification of ostracods from the Humboldt and Sheep Pass Formations and vertebrate and plant remains from Miocene alluvial sediments.

Memberships

Society of Vertebrate Paleontology; American Association of Petroleum Geologists; Canadian Society of Petroleum Geologists; Rocky Mountain Association of Geologists, Pacific Section; Society of Economic Paleontologists and Mineralogists; San Bernardino County Museum.

Publications in Geology

Five publications in Geology concerning an oil field study, a ground water and earthquake study, a report on the geology of the Santa Rosa Mountain area, and papers on vertebrate and invertebrate Holocene Lake Cahuilla faunas.

PALEONTOLOGICAL SURVEYOR/FIELD DIRECTOR
Daniel Ballester, B.A.

Education

- 1998 B.A., Anthropology, California State University, San Bernardino.
1997 Archaeological Field School, University of Las Vegas and University of California, Riverside.
1994 University of Puerto Rico, Rio Piedras, Puerto Rico.
- Cross-trained in paleontological field procedures and identifications by CRM TECH Geologist/Paleontologist Harry M. Quinn.

Professional Experience

- 2002- Field Director, CRM TECH, Riverside/Colton, California.
1999-2002 Project Archaeologist/Field Paleontologist, CRM TECH, Riverside, California.
1998-1999 Field Crew, K.E.A. Environmental, San Diego, California.
1998 Field Crew, A.S.M. Affiliates, Encinitas, California.
1998 Field Crew, Archaeological Research Unit, University of California, Riverside.

PALEONTOLOGICAL SURVEYOR
Robert Allen Porter, B.A.

Education

- 2000 B.A., Anthropology, California State University, San Bernardino.
2010 Graduate Student, Anthropology and Education, California State University, San Bernardino.
- Cross-trained in paleontological field procedures and identifications by CRM TECH Geologist/Paleontologist Harry M. Quinn.

Professional Experience

- 2001- Project Archaeologist/Field Paleontologist, CRM TECH, Riverside/Colton, California.
2000 Archaeological field class under the direction of Claude Warren. Excavated units at Soda Lake in the Mojave Desert and produced lake bottom stratigraphic profiles and carbon sample collections.

REPORT WRITER
Deirdre Encarnación, M.A.

Education

- 2003 M.A., Anthropology, San Diego State University, California.
2000 B.A., Anthropology, minor in Biology, with honors; San Diego State University, California.
1993 A.A., Communications, Nassau Community College, Garden City, N.Y.
- 2001 Archaeological Field School, San Diego State University.
2000 Archaeological Field School, San Diego State University.

Professional Experience

- 2004- Project Archaeologist/Report Writer, CRM TECH, Riverside/Colton, California.
2001-2003 Part-time Lecturer, San Diego State University, California.
2001 Research Assistant for Dr. Lynn Gamble, San Diego State University.
2001 Archaeological Collection Catalog, SDSU Foundation.

APPENDIX 2

RECORDS SEARCHES RESULTS