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November 3, 2014 RTL-01

Mr. Ted Semaan, Engineering Manager
Public Works Department
City of Torrance
20500 Madrona Avenue
Torrance, CA 90503

Subject: Biological Resources Letter Report for the Torrance Transit Park and Ride Regional Terminal Project

Dear Mr. Semaan:

This letter presents the results of a focused biological resources technical study performed by HELIX Environmental Planning, Inc. (HELIX) for the Torrance Transit Park and Ride Regional Terminal Project (proposed project) located within an approximately 15.0-acre property (project site or site) in the City of Torrance, Los Angeles County, California. The City of Torrance (City) is planning to develop a new transit center within portions of the project site. Previous studies identified potential environmental constraints on development of the site, including the presence of sensitive biological resources.

This letter report is intended to summarize the existing biological resources within the project site, provide a focused assessment of water and wetland resources potentially subject to regulatory agency jurisdiction, and provide an analysis of the proposed impacts in accordance with the California Environmental Quality Act (CEQA) and applicable federal, state, and local policy.

INTRODUCTION

Project Location

The project site is generally located north of Highway 1, south of Interstate 405, east of Highway 107, and west of Highway 213 in southern Los Angeles County, California (Figure 1). More specifically, the site occurs approximately ¼-mile south of the Del Amo Boulevard and Crenshaw Boulevard intersection, near the address of 465 Crenshaw Boulevard in the northern

portion of the City of Torrance (Figure 2). The site is depicted within an unsectioned portion of Township 4 South, Range 14 West of the Torrance, California U.S. Geological Survey (USGS) 7.5-minute quadrangle (Figure 3).

The project site is not located within a Significant Ecological Area (SEA) and is located outside of the Coastal Zone according to the Los Angeles County General Plan Update and associated maps (County of Los Angeles 2009). In addition, the site is not located within any Critical Habitat designated for federally listed species by the U.S. Fish and Wildlife Service (USFWS; 2014a). It does not occur within the boundaries of an adopted regional conservation plan.

Project Description

The City is planning to develop a new regional transit center to serve the community (Figure 4). The project site is currently vacant. Prior to the year 2000, the site supported an industrial facility ("Pacific Plate and Glass") with buildings and parking lots.

METHODS

Pre-Survey Investigation

Prior to conducting field surveys, a thorough review of relevant maps, databases, and literature pertaining to biological resources known to occur within the project vicinity was performed. Recent and historical aerial imagery (Google 2014; City of Torrance 2014a), topographic maps (USGS 1964), soils maps (City of Torrance 2014b), and other maps of the project site and vicinity were acquired and reviewed to obtain updated information on the natural environmental setting.

In addition, a query of sensitive species and habitats databases was conducted, including the USFWS species records (USFWS 2014b), California Department of Fish and Wildlife (CDFW) California Natural Diversity Database (CNDDB; CDFW 2014), and California Native Plant Society (CNPS) Electronic Inventory (CNPS 2010). The USFWS' National Wetland Inventory (NWI) was also reviewed (USFWS 2014c). Recorded locations of species, habitat types, wetlands, and other resources were mapped and overlaid onto aerial imagery using Geographic Information Systems (GIS). In addition, HELIX biologists Larry Sward and Karl Osmundson attended a site meeting with representatives from the City on May 8, 2014.

General Biological Survey

HELIX biologists Larry Sward and Karl Osmundson conducted a general biological survey on July 3, 2014 between the hours of 0930 and 1430, which included 100 percent visual coverage of the project site and immediate vicinity. The total area surveyed for the general biological survey was approximately 16.0 acres, which included the approximately 15.0-acre property and an additional 1.0 acre immediately surrounding the property. The general biological survey included an inventory of existing conditions and focused primarily on verifying existing vegetation

communities or habitat types, assessing suitability for sensitive plant and animal species, and identifying potential sensitive resources. Meandering pedestrian transects were performed throughout the site in order to obtain 100 percent visual coverage. Off-site areas were visually inspected by visual scans. Physical parameters assessed included vegetation and soil conditions, presence of indicator plant and animal species, slope, aspect and hydrology.

Vegetation was mapped on 1"=200' scale aerial imagery with ½-foot contour data. Plant and animal species observed or otherwise detected during biological surveys at the project site are included in Attachment A. Sensitive species and habitats recorded within five miles of the project site were analyzed for potential to occur (Attachment B). A complete list was compiled and recorded locations were mapped and overlaid onto aerial imagery using Geographic Information Systems (GIS). Plant identifications were made in the field. Directed inspections of habitat were performed to locate target rare plant species known to occur on the site and/or in the region. Animal species were identified by direct observation, vocalizations, or the observance of scat, tracks, or other signs. The lists of species identified are not necessarily comprehensive accounts of all species that occur on the site, as species that are nocturnal, secretive, or seasonally restricted may not have been observed. The July 3, 2014 survey was performed during a drought year, which is expected to have influenced the vegetation observed during the time of the survey. Representative photographs of the site were obtained (Attachment C). Conditions encountered in the field were compared to aerial imagery compiled for the site (Attachment D).

Fairy Shrimp Sampling

Protocol-level dry season fairy shrimp sampling (Attachment G) was performed by HELIX permitted biologist Jason Kurnow (Permit TE778195) and D. Christopher Rogers between August and October 2014 in accordance with USFWS protocol (USFWS 1996). Sampling was conducted on August 22, 2014 within depression areas in the northern portion of the site, as well as an excavated pit located in the southern portion of the site. Fourteen sample plots were established within the depression areas, with one sample plot located in the excavated pit. Approximate depth, area, and habitat condition of each sampled basin was noted and recorded on a USFWS Vernal Pool Data Sheet. Following soil collection, the samples were brought to the HELIX lab for analysis. Samples were prepared by dissolving the soil samples in water and sequentially sieving the material through 710-, 355-, and 212-µm pore size screens. The portion of each sample retained in the screen was dispersed in a brine solution to separate the organic from the inorganic material. The organic fraction was decanted, dried, and examined under a microscope. Cysts were identified to genus level based on surface characteristics.

In addition to the dry season sampling, a hatching effort was conducted to provide adult specimens that could be identified to species level. Upon written approval from the USFWS, additional soil was collected within each of the plots containing *Branchinecta* cysts and sent to Dr. Christopher Rogers for hatching. Soil samples were prepared for examination in the laboratory by dissolving the clumps of soil in distilled water. Adult shrimp were reared from the recovered eggs using methods following U.S. Environmental Protection Agency (1985), Belk, *et a*l. (1990), Maeda-Martinez, *et al*., (1995a and 1995b), and Jawahar & Dumont (1995). Hatched

shrimp were fed a standard Daphnia food that includes; fish food, fish oil, baker's yeast, and the alga *Selenastrum capricornutum*. The shrimp were reared to maturity. Adult *Branchinecta* reared from culture were killed in 90% ethyl alcohol, and examined under a stereo dissection microscope. Identifications were made based upon comparisons with specimens in our collections, the original species descriptions and professional experience.

Jurisdictional Delineation

A formal jurisdictional delineation of the site was conducted by HELIX biologists Larry Sward and Karl Osmundson concurrent with the July 3, 2014 general biological survey. The focus of the delineation was to determine the presence or absence of water and wetland resources potentially subject to the regulatory jurisdiction of the U.S. Army Corps of Engineers (USACE) pursuant to Section 404 of the federal Clean Water Act (CWA), Regional Water Quality Control Board (RWQCB) pursuant to Section 401 of the CWA or State Porter-Cologne Water Quality Control Act, and/or CDFW pursuant to Sections 1600 *et seq.* of the California Fish and Game Code (CFG Code).

Potential USACE wetland boundaries or lack thereof were determined using the three criteria (vegetation, hydrology, and soils) established for wetland delineations, as described within the *Wetlands Delineation Manual* (Environmental Laboratory 1987) and since updated in the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region* (USACE 2008a). Plants were identified according to Baldwin *et al*. (2012), and Calflora (2014) was used to augment common names. Wetland affiliations of plant species follow the *National Wetland Plant List* (Lichvar *et al.* 2014). Vegetation was mapped using a community-based system (Holland 1986) and cross-referenced with *A Manual of California Vegetation, Second Edition* (MCV; Sawyer *et al*. 2009). Soils information was taken from data provided by the City of Torrance (City of Torrance 2014b). Soil samples were evaluated for hydric soil indicators. Soil chromas were identified according to *Munsell's Soil Color Charts* (Kollmorgen 1994). Each sampling point was inspected for primary (i.e., inundation, saturation, water marks, drift lines, sediment deposits, and drainage patterns in wetlands) and secondary (e.g., oxidized root channels, water-stained leaves, and FAC-neutral test) wetland hydrology indicators. Complete *Wetland Determination Data Forms for the Arid West* region are included in Attachment E.

Potential USACE non-wetland boundaries were further determined using methods suggested by the USACE in *A Field Guide to the Identification of the Ordinary High Water Mark in the Arid West Region of the Western United States* (USACE 2008b). Areas were determined to be non-wetland waters of the U.S if there was evidence of regular surface flow (e.g., bed and bank) but the vegetation or soils criterion was not met. Jurisdictional limits for these areas were defined by the OHWM, which is defined in 33 CFR Section 329.11 as "that line on the shore established by the fluctuations of water and indicated by physical characteristics such as a clear, natural line impressed on the bank; shelving; changes in the character of the soil; destruction of terrestrial vegetation; the presence of litter or debris; or other appropriate means that consider the characteristics of the surrounding areas." The USACE has issued further guidance on the OHWM (Riley 2005; USACE 2008b), which also has been used for this delineation.

The results presented here are also discussed in light of court decisions (i.e., Rapanos v. United States, Carabell v. United States, and Solid Waste Agency of Northern Cook County [SWANCC] v. USACE), as outlined and applied by the USACE (USACE 2007; Grumbles and Woodley 2007), USACE and Environmental Protection Agency (EPA; 2007), and EPA and USACE (2007). These publications explain that the EPA and USACE will assert jurisdiction over traditional navigable waters (TNW) and tributaries to TNWs that are relatively permanent water bodies (RPWs), which have year-round or continuous seasonal flow. For water bodies that are not RPWs, a significant nexus evaluation must be conducted to determine whether the non-RPW is jurisdictional. An overview of USACE wetlands and jurisdictional waters of the U.S. definitions is presented in Attachment F.

In light of CWA Section 401, potential State Water Resources Control Board (SWRCB) or RWQCB jurisdictional boundaries were determined based on the presence or absence of potential waters of the U.S. In the context of CWA Section 401, waters of the State generally follow those identified for waters of the U.S. Isolated waters of the State subject to exclusive RWQCB jurisdiction under Porter-Cologne Water Quality Act were determined primarily based on evidence of wetland conditions and surface water area. The California Water Code Section 13050(e) defines waters of the State as “any surface water or groundwater, including saline waters, within the boundaries of the state”. This definition is broadly construed to include all waters within the State’s boundaries, whether private or public, including waters in both natural and artificial channels. In all applications, waters of the State include all waters of the U.S.; all surface waters that are not waters of the U.S. (e.g., isolated waters and wetlands); groundwater; and territorial seas.

Potential CDFW jurisdictional boundaries or lack thereof were determined based on the presence of riparian vegetation or regular surface flow. Streambeds within CDFW jurisdiction were delineated based on the definition of streambed as “a body of water that flows at least periodically or intermittently through a bed or channel having banks and supporting fish or other aquatic life. This includes watercourses having a surface or subsurface flow that supports riparian vegetation” (Title 14, Section 1.72). Definitions of CDFW jurisdictional areas are presented in in Attachment F.

In conjunction with adopting a wetlands policy on March 9, 1987, the California Fish and Game Commission assigned CDFW the task of recommending a wetlands definition. CDFW found the USFWS wetland definition and classification system to be the most biologically valid. CDFW use this definition as a guide in identifying wetlands while conducting on-site inspections for the implementation of its Commission's wetlands policy. The USFWS defines wetlands as: "Wetlands are lands transitional between terrestrial and aquatic systems where the water table is usually at or near the surface or the land is covered by shallow water. For purposes of this classification, wetlands must have one or more of the following three attributes: (1) at least periodically, the land supports hydrophytes, (2) the substrate is predominantly undrained hydric soil; and (3) the substrate is non-soil and is saturated with water or covered by shallow water at some time during the growing season of each year." (Cowardin 1979).

Additional Biological Studies and Plans

Additional reports and plans completed for the project are enclosed within Attachment G. These include a biological assessment report and conceptual tarplant mitigation plan prepared by Cooper Ecological Monitoring, Inc. (Cooper; 2014a and 2014b), in addition to the HELIX and D. Christopher Rogers dry season fairy shrimp sampling report.

RESULTS

Existing Conditions

General Land Use

The City zoning map shows the project site zoning as Heavy Manufacturing (M-2). The site is currently vacant with no existing uses. It is enclosed with perimeter fencing. Prior to the year 2000, the site supported an industrial facility known as the Pacific Plate and Glass, with buildings and parking lots. General land uses surrounding the site include a mix of industrial and residential uses to the north, south, east and west. The site is completely surrounded by developed land. The closest undeveloped land is located approximately ½ mile to the northwest near the corner of Del Amo Boulevard and Prairie Avenue.

Disturbance

The entire study area contains evidence of intense disturbance from previous industrial uses and maintenance activities. The site supported development from 1950 through 2000. As mentioned above, prior to the year 2000, the site supported an industrial facility with buildings and parking lots. Previous development resulted in elimination of natural habitat and surface soils. Evidence of ongoing anthropogenic disturbance from trespass, off-highway vehicle (OHV) activity, dumping, littering, and other physical disturbance was noted throughout the site. The site is also reported to have been subject to weed abatement activities, including mowing and grazing (Cooper 2014a). Due to its adjacency with intense urban uses, the site is subject to regular noise, lighting, invasion by non-native exotic species, and other spillover effects. Where vegetation is present, it is overrun by non-native and disturbance-tolerant plant species typical of highly disturbed, vacant lots in urbanized areas. Sign of domestic pets was also observed. Natural disturbance to the site includes occasional flooding and inundation within the lower elevations of the site.

Topography and Soils

Topography of the project site is generally flat, with elevations ranging from approximately 80 feet above mean sea level (amsl) in the southern portions of the site to approximately 65 feet amsl in the north-central portion of the site. The ½-foot contour microtopography of the site is depicted on Figure 5. At the microtopography level, the site is uneven and reflects patterns of

demolition, materials removal, stockpile, and other activities associated with previous uses. Several distinct depressions have been imprinted on the site as a result of previous activities. Aerial imagery suggests the lowest elevations in the northern portions of the site that support these depressions become inundated and saturated during higher rainfall years.

Two soil mapping units are identified for the site: Oakley fine sand and Ramona fine sandy loam (Figure 6). The surface soils throughout the entire site show evidence of a high degree of disturbance. Shallow excavations in the upper soil horizons during the July 3, 2014 survey confirmed the presence of foreign materials, especially imported gravel and fragments of cement. Geotechnical testing previously performed at the site reveal silty sand with varying amounts of gravel within five feet of the surface over the majority of the site (Cooper 2014a; Diaz Yourman & Assoc. 2013). Presence of an underlying claypan is evident, with clay or sandy clay/clayey sand found below the upper five feet and clays down to around 10' below surface (Cooper 2014; Diaz Yourman & Assoc. 2013). Based on aerial imagery, the soils within the lowest elevations are apparently subjected to flood disturbance.

Vegetation Communities / Habitat Types

Vegetation communities or habitat types are classified in this report according to Holland (1986), with further guidance from Oberbauer et al. (2008). Four vegetation community or land use types were mapped by HELIX within the project site (Figure 7): mule fat scrub, herbaceous wetland, non-native vegetation, and disturbed habitat. Within the areas mapped by HELIX, the following classifications are reported to occur from Cooper (2014a) following guidance in *A Manual of California Vegetation, Second Edition* (MCV; Sawyer *et al*. 2009): mule fat thickets, spike rush marsh, tarplant field, annual grassland, and barren. The existing vegetation communities are summarized below within Table 1.

Table 1
EXISTING VEGETATION COMMUNITIES

VEGETATION COMMUNITY		ACREAGE
HOLLAND	**MCV**	
Mule Fat Scrub	• *Baccharis salicifolia* Shrubland Alliance (Mule Fat Thickets) • *Centromadia* Herbaceous Alliance (Tar Plant Fields)	1.68
Herbaceous Wetland	• *Bolboschoenus maritimus* Herbaceous Alliance (Salt Marsh Bulrush Marshes) • *Eleocharis macrostachya* Herbaceous Alliance (Pale Spike Rush Marshes)	0.01

Table 1 (cont.) EXISTING VEGETATION COMMUNITIES		
VEGETATION COMMUNITY		ACREAGE
HOLLAND	MCV	
Non-native Vegetation	• None	0.12
Disturbed Habitat	• *Bromus diandrus* Semi-Natural Herbaceous Stands (Annual Brome Grasslands) • *Centromadia* Herbaceous Alliance (Tar Plant Fields) • Barren	13.19
TOTAL		**15.00**

Mule Fat Scrub

Mule fat scrub, also referred to as *Baccharis salicifolia* shrubland alliance (mule fat thickets), is a stunted, shrubby scrub community dominated by mule fat (*Baccharis salicifolia*). This vegetation community typically occurs along intermittent stream channels with a fairly coarse substrate and moderate depth to the water table, but also within seasonally wet places and uplands with high moisture retention. This community may be maintained by frequent flooding, the absence of which would lead to a cottonwood or sycamore dominated riparian woodland or forest (Holland 1986). In other places, the limited hydrology may be unsuitable for anything more mesic than mule fat scrub, where the habitat occurs entirely within uplands or within transition areas between uplands and wetlands.

Several small monotypic mule fat stands occur throughout the site. Altogether, these stands cover approximately 1.68 acres of the site. Isolated mule fat shrubs also occur throughout the site intermittent to these stands. The individual shrubs are too widely-spaced from one another to consider them as concentrations or contributions to functioning mule fat scrub stands. The mule fat scrub on the site is not associated with any observed surface hydrology. The scrub is not associated with a watercourse or streambed, and does not occur in sufficient size to constitute functioning riparian habitat.

Within the understory of portions of the mule fat scrub are concentrations of southern tarplant (*Centromadia parryi* ssp. *australis*), also referred to as *Centromadia* herbaceous alliance (tar plant fields). In addition, a very small concentration of a few, low quality arroyo willow (*Salix lasiolepis*) and black willow (*Salix gooddingii*) occur in association with the deepest man-made depression or basin in the northern-central portion of the site. The small stand is not associated with a watercourse or streambed, and does not occur in sufficient size to constitute functioning riparian habitat. It is considered part of the mule fat scrub community.

Herbaceous Wetland

Herbaceous wetland, also referred to herein as *Bolboschoenus maritimus* herbaceous alliance (salt marsh bulrush marshes) and *Eleocharis macrostachya* herbaceous alliance (pale spike rush marshes), is a subset of vernal marsh that is essentially comprised of seasonal wetlands supporting mainly annual species. Herbaceous wetlands do not support species typically associated with perennial freshwater marsh habitats (e.g., *Typha*, *Scirpus*, and *Juncus*).

Herbaceous wetlands may only occur during wetter than average years and are usually found in swale areas or adjacent to drainages. Characteristic species include annuals such as creek monkeyflower (*Mimulus guttatus*) and rabbitsfoot grass (*Polypogon monospeliensis*). Approximately 0.01 acre of herbaceous wetland occurs within the floor and side slopes of the deepest man-made depression in the northern-central portion of the site.

Non-native Vegetation

Non-native vegetation is a category describing stands of vegetation heavily dominated by non-native trees and shrubs (e.g., peppertree [*Schinus* sp.], oleander [*Nerium oleander*], palm [*Arecaceae* family], wattle [*Acacia* spp.], etc.), many of which are exotic and escapees from ornamental landscaping. Approximately 0.12 acre of non-native vegetation dominated by Chinese elm (*Ulmus parvifolia*) was mapped on the site.

Disturbed Habitat

Disturbed habitat or disturbed land includes land cleared of vegetation; land containing a preponderance of non-native plant and disturbance-tolerant species; or land showing signs of past or present usage that removes any capability of providing viable habitat. This classification includes ruderal (weedy) areas dominated by species typical of highly disturbed sites. This includes areas that have been physically disturbed (by previous legal human activity) and are no longer recognizable as a native or naturalized vegetation association, but continue to retain a soil substrate. Typically vegetation, if present, is composed of non-native plant species such as non-native ornamentals, non-native grasses, and ruderal species that take advantage of disturbance.

Examples of disturbed land include areas that have been graded, repeatedly cleared for fuel management purposes and/or experienced repeated use that prevents natural revegetation. Characteristic species include invasive, non-native forb species, such as thistles (*Centaurea* spp., *Carduus* spp., *Cynara* spp., *Sonchus* spp., *Salsola tragus*), horehound (*Marrubium vulgare*), London rocket (*Sisymbrium irio*), wild radish (*Raphanus* spp.), ice plant (*Carpobrotus edulis*), garland daisy (*Chrysanthemum* spp.), and fennel (*Foeniculum vulgare*). A limited number of grass species may be present [bromes (*Bromus* spp.), oats (*Avena* spp.), Pampas grass (*Cortaderia* spp.), fountain grass (*Pennisetum* spp.)]; however, grass species typically not dominate the vegetative cover in disturbed habitat.

Disturbed habitat is the dominant community on the site, totaling 13.19 acres. The disturbed habitat on the site has elements of barren land, *Bromus diandrus* semi-natural herbaceous stands (annual brome grasslands), and *Centromadia herbaceous* alliance (tar plant fields). The primary factor used in mapping this habitat type was evidence of intense land disturbance and presence of bare ground and indicator plant species. Surface soils in these areas are highly disturbed. There is evidence of dumping, trash, debris, and a prevalence of non-native species. Most of the non-native species described above were observed within the disturbed habitat on the site. Some areas contained higher percent cover of non-native grasses; however, were too small to map individually as small patches of non-native grassland. As depicted on Figure 7, single special-status plant species, southern tarplant, has been previously mapped within the disturbed habitat on the site (Cooper 2014a).

General Fauna

The project site is disturbed and does not provide extensive high quality habitat for animal species. Overall animal activity during the general survey was low. Animal species observed or otherwise detected onsite included common reptile species such as western fence lizard (*Sceloporus occidentalis*); bird species such as house finch (*Carpodacus mexicanus*), lesser goldfinch (*Spinus psaltria*), mourning dove (*Zenaida macroura*), northern mockingbird (*Mimus polyglottos*), and American crow (*Corvus brachyrhynchos*); and mammals such as desert cottontail (*Sylvilagus audubonii*), California ground squirrel (*Spermophilus beecheyi*), Botta's pocket gopher (*Thomomys bottae*), and domestic dog (*Canis familiaris*). A complete list of plant and animal species observed or otherwise detected is included as Attachment A.

<u>Sensitive Biological Resources</u>

Sensitive Natural Communities

Sensitive natural communities include land that supports unique vegetation communities or the habitats of rare or endangered species or subspecies of animals or plants as defined by Section 15380 of the CEQA Guidelines.

The project site supports mule fat scrub and herbaceous wetland. These communities can be considered sensitive when found in a natural state or associated with sensitive resources (e.g., special-status species, jurisdictional waters and wetlands). Both of these communities occur in very small, isolated and disturbed stands located on portions of the site that used to be entirely developed and are now highly disturbed. They are relatively low in habitat quality due to disturbance and isolation from habitat blocks in the local and regional area.

The mule fat scrub is monotypic and comprised almost exclusively of mule fat shrubs that have recruited onto the site in the recent past. It is not associated with any surface water or streambed feature, and is situated within an upland landscape position. The isolated willow trees within the mule fat scrub appeared to be water stressed and were not associated with any surface drainage feature or streambed. The individual trees do not constitute a functioning stand of riparian habitat

and do not provide high value to wildlife resources. The mule fat scrub occurs scattered throughout the project site. In the Arid West region, mule fat is considered a facultative (FAC) species, which means that it is equally likely to occur in wetlands or non-wetlands (estimated probability 34% – 66%). As such, its presence alone does not indicate a true upland or wetland position on the site. As discussed in further detail below, the areas supporting stands of mule fat scrub on the site did not support wetland conditions during the jurisdictional delineation.

The herbaceous wetland is extremely small in size (0.01 acre), isolated, and associated with a man-made basin. Although wetland conditions were confirmed, the area is disturbed and impaired from previous and existing land uses. The water quality and biophysical benefits of the isolated wetland are expected to be negligible due to the small area. The small area would not be expected to accelerate groundwater recharge and or have an important role in cycling nitrogen, sulfur, methane and carbon in the ecosystem. The wetland area would be expected to have extremely limited biophysical value to the ecosystem as it has no connectivity to higher quality habitat. Due to the small size and isolated nature of the area, it would not be expected to substantially aid in filtering impurities on the site.

Overall, the site is depauperate and lacks resources typical of natural wetland and riparian habitats in the region. The mule fat scrub and herbaceous wetland on the site do not occur in a natural state and are limited in function, value, and service. Therefore, in their current state, these communities are not considered sensitive.

Special-Status Plant and Animal Species

Special-Status Plant Species

Special-status plant species are those listed as federally threatened or endangered by the USFWS; State listed as threatened or endangered or considered sensitive by the CDFW; and/or, are CNPS California Rare Plant Rank (CRPR) List 1A, 1B, or 2 species, as recognized in the CNPS's Inventory of Rare and Endangered Vascular Plants of California and consistent with the CEQA Guidelines. Special-status plant species with potential to occur on the project site are included in Attachment B.

Southern Tarplant

Previous surveys of the project site reported in Cooper (2014a) confirmed the presence of southern tarplant, which is a non-listed rare plant designated by the CNPS as having a CRPR of 1B.1. This species was observed during the July 2014 survey. Figure 7 depicts the approximate locations of southern tarplant on the project site based on previous survey mapping data (Cooper 2014a). An estimated 350 to 400 individuals have been reported as occurring on the site, with the highest number and largest concentrations occurring in the central and northern portions (Cooper 2014a). No other sensitive plant species have the potential to occur within the project site due to lack of suitable habitat; inappropriate soil conditions; inappropriate elevations; existing disturbances; and prevalence of non-native plant species.

Special-Status Animal Species

Special-status animal species are those listed as threatened or endangered, proposed for listing, or candidates for listing by the USFWS and considered sensitive animals by the CDFW. Special-status animal species with potential to occur on the project site are included in Attachment B. A single special-status animal, Cooper's hawk (*Accipiter cooperii*), was observed using the site on a single occasion during surveys in 2014 (Cooper 2014a). Although not observed during biological surveys at the project site, the California legless lizard (*Aniella pulchra*) was determined to have a high potential to occur. In addition, suitable habitat was identified for special-status fairy shrimp species, including the federally endangered San Diego fairy shrimp (*Branchinecta sandiegonensis*) and Riverside fairy shrimp (*Streptocephalus woottoni*). These special-status animals are discussed in further detail below. No other special-status animal are expected to occur due to lack of suitable habitat; local and regional isolation of the site; highly urbanized areas completely surrounding the site; adjacency with existing developments; past and ongoing disturbances, including noise, lighting, illegal dumping, pedestrian use, off-highway vehicle use, and evidence of occasional flooding; and evidence of domestic pet use (i.e., dog).

Fairy Shrimp

There are four species of fairy shrimp known to occur within Los Angeles County: Riverside fairy shrimp, giant fairy shrimp (*Branchinecta gigas*), alkali fairy shrimp (*B. mackini*), and versatile fairy shrimp (*B. lindahli*). In addition, the San Diego fairy shrimp (*B. sandiegonensis*), although not currently known from Los Angeles County, is known from locations within Orange County and has the potential to occur. The San Diego and Riverside fairy shrimp are federally listed as endangered and designated as California species of special concern, while the giant, alkali, and versatile fairy shrimp are relatively common and are not listed or considered sensitive.

San Diego fairy shrimp are found in San Diego and Orange Counties and occur in vernal pools and other ephemeral ponds or basins. Riverside fairy shrimp can be found in Riverside, Orange, San Diego, and Los Angeles counties and occur in vernal pools and other ephemeral basins with long inundation times. The versatile fairy shrimp is common in pools throughout California and can co-occur with both San Diego and Riverside fairy shrimp. Both alkali fairy shrimp and giant fairy shrimp occur in alkaline basins. These two species can co-occur where their ranges overlap.

Fairy shrimp are adapted for variable and uncertain rainfall patterns. When fertilized by males of their species, female fairy shrimp produce "resting eggs," called cysts, which are dormant embryos surrounded by hard-shelled membranes capable of remaining viable in the soil for long periods of time. Dry season fairy shrimp surveys are designed to detect, collect, and identify cysts present in the soil. The surface characteristics of these cysts can be used to differentiate the genus and potentially the species of fairy shrimp. Certain fairy shrimp, such as *B. lindahli* and *B. sandiegonensis*, cannot be identifiable to the species level by examination of the cysts alone. For these species, authorized hatching is performed as a component of the dry season survey to identify individuals to species level.

Year 2014 protocol-level dry season fairy shrimp sampling was completed for the project by HELIX and D. Christopher Rogers (Attachment G). Fifteen plots, covering two distinct areas were sampled for the presence of fairy shrimp cysts (Figure 10). *Branchinecta* cysts were present in 14 plots. No other species, including *Streptocephalus* sp. cysts, were observed in any of the sampled plots. Plots containing *Branchinecta* cysts included plots 1 and 2, and 4 through 15. Of the plots containing *Branchinecta* cysts, only the non-listed versatile fairy shrimp (*Branchinecta lindahli*) was cultured from the hatching effort.

No San Diego fairy shrimp, Riverside fairy shrimp, or any other special-status fairy shrimp species were found during the dry season sampling effort. Special-status fairy shrimp species are currently presumed to be absent from the project site.

Silvery Legless Lizard

Silvery legless lizard is not federally or state listed as endangered or threatened, but is designated as a California species of special concern. It has a an element ranking score of G3G4T3T4Q S3, which categorizes the species on a global and state level as being vulnerable to apparently secure; uncommon but not rare; some cause for long-term concern due to declines or other factors; and at a moderate risk of extinction due to restricted range, relatively few populations (often 80 or fewer), recent and widespread declines, or other factors. This species inhabits a variety of habitat types with moist areas supported by loose, sandy soil or leaf litter. This species is relatively common and highly localized within urban Los Angeles County. Scattered sightings of legless lizard have been made in the Torrance/South Bay region, indicating they can persist where soil conditions are suitable in areas with high sand content and no recent major soil disturbance (Cooper 2014a).

This species has not been observed on the project site based on survey findings to date, although environmental conditions have not been optimal for detection. Based on local occurrence and the presence of marginal habitat within portions of the site, this species was determined to have a potential to occur. If present at the site, this species would likely only be present in very low numbers due to site's history of disturbance, small size, geographic isolation, and lack of high quality habitat.

Cooper's Hawk

Cooper's hawk was recently demoted to a watch list species having previously been designated a California species of special concern. The species frequents urbanized areas in the region where suitable woodland habitat occurs for nesting. It most commonly nests in oak groves, mature riparian forest, and in tall eucalyptus trees. It forages on the fly within a wide variety of habitat types.

A single Cooper's hawk was reported as being observed during a survey of the site on April 7, 2014 (Cooper 2014a). The individual was likely a resident in the area, nesting in an off-site location and foraging on the site. No active or inactive nests belonging to any raptor species have been observed on the site during surveys to date. Cooper's hawk has the potential to forage over the site. The species would not be expected to nest, although a single gum tree occurs in the northern portion of the site that provides marginal nesting habitat for this and other common raptor species known to the local area.

Nesting Birds and Raptors

The project site contains suitable nesting habitat for several common bird species, including raptors, protected under the Migratory Bird Treaty Act (MBTA) and CFG Code.

Jurisdictional Waters and Wetlands

In the context of this assessment, jurisdictional waters and wetlands include waters of the U.S., including wetlands, regulated by the USACE pursuant to CWA Section 404; waters of the State regulated by the RWQCB pursuant to Section 401 of the CWA and State Porter-Cologne Water Quality Control Act; and/or, streambed and riparian habitat regulated by the CDFW pursuant to Sections 1600 *et seq.* of CFG Code.

Wetland Sampling Points

Six wetland sampling points were established throughout the project site (Figure 8). The sampling points were selected based on the lowest elevations on the site, where water would be expected to drain or collect, in addition to areas where wetland-related vegetation was observed. The delineation effort and sampling points specifically focused on areas that fall below the 70-foot contour line in the northern portions of the site. A summary of the conditions found at the representative sampling points is provided below.

In addition, historical aerial imagery of the project site was obtained and reviewed to validate the history of disturbance on the site and provide evidence of wetland conditions (e.g., wetland vegetation signatures, inundation, saturation, etc.), or lack thereof. Wet season aerial imagery for a sampling set of years between 2003 and 2011 was specifically reviewed in detail to analyze frequency of inundation and saturation on the project site (Figure 9).

<u>Sampling Point 1</u>. This sampling point was established within the second lowest depression in the northern portion of the site. The vegetation was dominated by non-native grasses and forbs, with over half of the sampling area (55 percent) comprised of bare ground in the herbaceous stratum. Botta's pocket gopher (*Thomomys bottae*) burrows were observed throughout the sampling area. Six of the eight plant species present are obligate upland species. The remaining two species are facultative upland species. The vegetation did not meet the dominance test and the prevalence index was 4.8, which indicates a lack of hydrophytic vegetation indicators of a wetland. Hydrophytic vegetation was not present at this sampling point. The area could be

regarded as a problem area for vegetation based on evidence of seasonal inundation and saturation visible on aerial imagery; however, there was a strong dominance of upland plant species at the sampling point. There were no indicators of hydric soils. Soils were sandy clay loam and clay, with the entire profile containing evidence of fill and foreign material mixed into the profile. No wetland hydrology indicators were observed in the field; however, a single primary wetland hydrology indicator (inundation visible on aerial imagery) was evident based on review of historical imagery of the site. Wet season inundation or saturation was visible on aerial imagery from four of six years reviewed (2005, 2006, 2008, and 2011). Despite this hydrology indicator, the sampling point was determined to not support wetland conditions based on the absence of hydrophytic vegetation and hydric soils.

Sampling Point 2. This sampling point was established in the northwestern portion of the site, just below the 70-foot contour line, at an elevation of approximately 69.5 feet amsl. Where vegetation was present, it was dominated by non-native forbs and grasses typical of disturbed upland areas. Approximately 62 percent of the sampling area comprised of bare ground with an abundance of Botta's pocket gopher burrows. Five of the six plant species present are obligate upland species. The remaining plant is a facultative species. The vegetation did not meet the dominance test and the prevalence index was 4.9, which indicates a lack of hydrophytic vegetation indicators of a wetland. Hydrophytic vegetation was not present at the sampling point. There were no indicators of hydric soils. Soils were sandy clay loam and sandy loam, with the profile containing evidence of fill and foreign material. No wetland hydrology indicators were observed in the field; however, a single primary wetland hydrology indicator (inundation visible on aerial imagery) was evident based on review of historical imagery of the site. Wet season inundation or saturation was visible on aerial imagery from one of six years reviewed (2005). Despite this hydrology indicator, the sampling point was determined to not support wetland conditions based on the absence of hydrophytic vegetation and hydric soils.

Sampling Point 3. This sampling point was established amongst a stand of mule fat scrub located in the central-eastern portion of the site, just below the 70-foot contour at approximately 69 feet amsl. Vegetation was dominated by mule fat in the sapling/shrub stratum and non-native grasses in the herb stratum typical of disturbed upland areas. Approximately 10 percent of the sampling area comprised of bare ground. Four of the seven plant species present are obligate upland species. Two of the remaining species are facultative upland and one is facultative. The vegetation did not meet the dominance test and the prevalence index was 4.5, which indicates a lack of hydrophytic vegetation indicators of a wetland. Hydrophytic vegetation was not present at the sampling point. The area could be regarded as a problem area for vegetation based on evidence of seasonal inundation and saturation visible on aerial imagery; however, there was a strong dominance of upland plant species at the sampling point. There were no indicators of hydric soils. Soils were highly compacted clay loam and clay. No wetland hydrology indicators were observed in the field and the sampling point does not pass the FAC-neutral test. A single primary wetland hydrology indicator (inundation visible on aerial imagery) was evident based on review of historical imagery of the site. Wet season inundation or saturation was visible on aerial imagery from one of six years reviewed (2005). Despite this hydrology indicator, the sampling

point was determined to not support wetland conditions based on the absence of hydrophytic vegetation and hydric soils.

Sampling Point 4. This sampling point was established at the lowest-elevation, man-made basin or sump feature located within the 70-foot contour in the central portion of the site. The feature was mapped as supporting herbaceous wetland at the basin floor and along the lower slopes, with southern willow scrub above on the upper slopes and rim. Of the six plant species observed, one is upland, one is facultative upland, three are facultative wetland, and one is obligate wetland. Biotic crust was observed over 20 percent of the basin floor; bare ground comprised 42 percent. The vegetation met the dominance test, thereby confirming the presence of hydrophytic vegetation. Hydric soils were confirmed by the presence of a depleted matrix. Several wetland hydrology indicators were met, including surface water observed (recent May 8, 2014 site visit), surface soil cracks, and inundation visible on aerial imagery (2003, 2004, 2005, 2006, 2008, and 2011). The sampling point was determined to support wetland conditions.

Sampling Point 5. This sampling point was established within an excavated pit adjacent to spoils piles in the south-central portion of the site. Vegetation was dominated by mule fat and non-native grasses. Approximately 20 percent of the sampling area comprised of bare ground. Two of the plant species present are obligate upland species and two are facultative. The vegetation did not meet the dominance test and the prevalence index was 4.0, which indicates a lack of hydrophytic vegetation indicators of a wetland. Hydrophytic vegetation was not present at the sampling point. The area was considered as a potential problem area for vegetation; however, there is no strong evidence of seasonal inundation or saturation from aerial imagery and field indicators. There were no indicators of hydric soils. Soils were clay and sandy clay loam. No wetland hydrology indicators were observed in the field. The sampling point was determined to not support wetland conditions based on lack of all three indicators.

Sampling Point 6. This sampling point was established in the northeastern portion of the site, just below the 70-foot contour line, at an elevation of approximately 69 feet amsl. Vegetation was dominated by a single non-native tree and non-native grasses typical of disturbed upland areas. Approximately 44 percent of the sampling area comprised of bare ground. Four of the nine plant species present are obligate upland species. The remaining plants include two facultative upland species, two facultative species, and one facultative wetland species. The vegetation did not meet the dominance test and the prevalence index was 4.2, which indicates a lack of hydrophytic vegetation indicators of a wetland. Hydrophytic vegetation was not present at the sampling point. There were no indicators of hydric soils. Soils were hard-packed sandy loam, with the profile containing evidence of fill and foreign material. No wetland hydrology indicators were observed in the field; however, a single primary wetland hydrology indicator (inundation visible on aerial imagery) was evident based on review of historical imagery of the site. Wet season inundation or saturation was visible on aerial imagery from two of six years reviewed (2005 and 2008). Despite this hydrology indicator, the sampling point was determined to not support wetland conditions based on the absence of hydrophytic vegetation and hydric soils.

Vegetation Assessment

As discussed above, five vegetation communities/land cover types were mapped on the site during the July 3, 2014 survey: mule fat scrub, herbaceous wetland, non-native vegetation, and disturbed habitat (Table 1; Figure 7). A total of 27 plant species were identified within sampling points taken during the delineation (Table 2). Only five of the 27 species are native; the remaining 22 species are non-native. A single obligate wetland plant was observed at the sampling points: alkali bulrush (*Bolboschoenus maritimus*).

Table 2
PLANT SPECIES OBSERVED AT SAMPLING POINTS

SPECIES	COMMON NAME	INDICATOR STATUS†
Amaranthus blitoides	prostrate pigweed	FACW
*Avena barbata**	oats	UPL
*Avena fatua**	wild oats	UPL
Baccharis salicifolia	mule fat	FAC
Bolboschoenus maritimus	alkali bulrush	OBL
*Brassica nigra**	black mustard	UPL
*Bromus diandrus**	soft chess	UPL
Bromus madritensis ssp. *rubens**	red brome	UPL
Centromadia parryi ssp. *australis*	southern tarplant	FACW
Chamaesyce albomarginata	rattlesnake weed	UPL
*Cortaderia selloana**	pampas grass	FACU
*Cynodon dactylon**	Bermuda grass	FACU
*Echinochloa crus-galli**	barnyard grass	UPL
Eleocharis macrostachya	spike rush	FACW
*Erodium cicutarium**	redstem filaree	UPL
*Erodium moschatum**	whitestem filaree	UPL
*Eucalyptus camaldulensis**	Red River gum	FAC
*Hirschfeldia incana**	shortpod mustard	UPL
*Hordium murinum**	foxtail barley	FACU
*Festuca myuros**	rattail fescue	UPL
*Festuca perennis**	Italian rye grass	FAC
*Malva neglecta**	common mallow	UPL
*Polypogon monspeliensis**	rabbitsfoot grass	FACW
*Rumex crispus**	curly dock	FAC
*Salsola tragus**	Russian thistle	FACU
*Sisymbrium irio**	London rocket	UPL

Table 2 (cont.) PLANT SPECIES OBSERVED AT SAMPLING POINTS		
SPECIES	**COMMON NAME**	**INDICATOR STATUS†**
*Stipa millacea**	Smilo grass	UPL

†OBL=obligate wetland species, FACW=facultative wetland species, FAC=facultative species, FACU=facultative upland species, UPL=obligate upland species, +=a frequency toward the wetter part of a category, where – is the opposite; NI=insufficient data is available to assign a wetland rating.
*Non-native species

Soils Assessment

As discussed above, two soil mapping units are identified for the site: Oakley fine sand and Ramona fine sandy loam (Figure 6). These soils are not identified as being hydric in Los Angeles County (USDA 2014). The surface soils throughout the entire site show evidence of a high degree of disturbance. Excavations in the upper soil horizons during the delineation confirmed the presence of foreign materials, especially imported gravel and fragments of cement. Geotechnical testing performed at the site reveal silty sand with varying amounts of gravel within five feet of the surface over the majority of the site (Cooper 2014a; Diaz Yourman & Assoc. 2013). Presence of an underlying claypan is evident, with clay or sandy clay/clayey sand found below the upper five feet and clays down to around 10’ below surface (Cooper 2014; Diaz Yourman & Assoc. 2013). Groundwater was not detected during soil geotechnical investigation, but was found to begin at approximately 85’ below the surface in a prior study (Cooper 2014a; Earth Tech AECOM 2009).

Hydrology Assessment

With the exception of a single basin at Sampling Point 4, which showed evidence of recent surface water and soils cracks, the only primary wetland hydrology indicator at the project site was evidence of inundation on aerial imagery. Without survey data from previous years, wet season aerial imagery for a sampling set of years between 2003 and 2011 was reviewed to analyze frequency of inundation and saturation on the project site (Figure 9). The two lowest-lying basins corresponding with Sampling Point 1 and Sampling Point 4 situated below the 70-foot contour represent the only areas on the site that show evidence of more frequent inundation and a consistent surface water area. Wet season aerial imagery provides evidence that these two basins become inundated most frequently and an estimated five of the six years sampled.

Jurisdictional Discussion

Wetland conditions are limited to a single location at Sampling Point 4 within one of the man-made depressions or basins in the central portion of the project site. The remaining areas sampled within the site do not support wetland conditions. Topography, aerial imagery, and previous site

visits indicate that areas in the northern portion of the site are subject to periodic inundation and saturation events. However, with the exception of Sampling Point 4, all other areas sampled within the site were found to support upland (non-wetland) conditions. The NWI data indicates no wetlands within the project site (USFWS 2014). The results of the delineation agree with the NWI data.

With respect to regulatory agency jurisdiction, the basin features on the site that show evidence of more frequent inundation or a consistent surface water area could qualify as isolated wetland and non-wetland waters of the State subject to the regulatory jurisdiction of the RWQCB pursuant to the State Porter-Cologne Water Quality Control Act. Based on the best available data for this study, the two lowest-lying basins (corresponding with Sampling Point 1 and Sampling Point 4) situated below the 70-foot contour represent the only areas on the site that show evidence of more frequent inundation and a consistent surface water area. Wet season aerial imagery provides evidence that these two basins become inundated most frequently and an estimated five of the six years sampled for this study. Based on evidence of more frequent inundation a consistent surface water area during the wet season, these two basins could be considered jurisdictional by the RWQCB as waters of the State, although it should be acknowledged that the basins are clearly man-made and provide no beneficial use and limited functions, value, and services to the site and region. The remaining portions of the site, although occasionally subject to inundation or saturation, should not be considered waters of the State.

Wildlife Corridors and Linkages

Wildlife corridors connect otherwise isolated pieces of habitat and allow movement or dispersal of plant materials and animals. Local wildlife corridors allow access to resources such as food, water, and shelter within the framework of their daily routine and life history. For example, animals can use these corridors to travel between their riparian breeding habitats and their upland burrowing habitats. Regional corridors provide these functions over a larger scale and link two or more large habitat areas, allowing the dispersal of organisms and the consequent mixing of genes between populations. A corridor is a specific route that is used for the movement and migration of species, and may be different from a linkage in that it represents a smaller or narrower avenue for movement. A linkage is an area of land that supports or contributes to the long-term movement of animals and genetic exchange by providing live-in habitat that connects to other habitat areas. Many linkages occur as stepping-stone linkages that are comprised of a fragmented archipelago arrangement of habitat over a linear distance.

No wildlife corridors or linkages occur on or in the immediate vicinity of the site. The project site is surrounded on all sides by highly urbanized land. It is locally and regionally isolated and separated from undeveloped land by expansive development. The site does not support habitat that would contribute substantially to the assembly and function of any local or regional wildlife corridors or linkages. The habitat that exists is relatively low in quality and is disconnected and isolated from better quality habitat in the local and regional area. The site is enclosed with perimeter fencing. Animal species that require direct or less-constrained habitat connectivity along their travel routes would be challenged to find access to the habitat within the site and

immediate vicinity. The project site is likely used by common resident and migratory birds with the ability to fly over long distances. Due to the site's isolation and the fact there are no additional undeveloped parcels or habitat fragments in the local area, it does not function as a stepping-stone linkage and is not part of an archipelago chain of small open space patches amongst the urbanized area. Many birds would not be expected to move onto the site from undeveloped land in the region due to the distance they would have to travel over urbanized land that is highly disturbed and provides little to no vegetative cover. Therefore, the project site does not support habitat that would contribute substantially to the assembly and function of any local or regional wildlife corridors or linkages.

APPLICABLE REGULATIONS

Based on the findings of this report, activities affecting the biological resources determined to exist or have the potential to exist within the project site could be subject to the federal, State, and local regulations discussed below.

Federal

Federal Endangered Species Act

The Federal Endangered Species Act (ESA) (7 United States Code (USC) 136; 16 USC 460 et seq. [1973]) extends legal protection to plants and animals, listed as endangered or threatened by the United States Fish and Wildlife Service (USFWS), and gives authorization to the USFWS to review proposed federal actions to assess potential impacts to species listed as endangered or threatened. The ESA generally prohibits the "taking" of a federally listed species.

"Taking" of a threatened or endangered species is deemed to occur when an intentional or negligent act or omission results in any of the following actions: "to harass, harm, pursue, hunt, shoot, kill, trap, capture, or collect, or attempt to engage in any such conduct." Such acts may include significant habitat modification or degradation if it results in death or injury. Likewise, import, export, interstate, and foreign commerce of listed species are all prohibited. Sections 7 and 10 of the ESA permit "incidental take" of a listed species via a federal or private action, respectively, through formal consultation with the USFWS. In lieu of a separate Section10a Permit, an applicant may be included in a local Habitat Conservation Plan (HCP).

Migratory Bird Treaty Act

All migratory bird species that are native to the United States or its territories are protected under the federal Migratory Bird Treaty Act (MBTA) as amended under the Migratory Bird Treaty Reform Act of 2004 (FR Doc. 05-5127). The MBTA is generally protective of migratory birds but does not actually stipulate the type of protection required. In common practice, USFWS places restrictions on disturbances allowed near active raptor nests.

State

California Environmental Quality Act

Primary environmental legislation in California is found in the CEQA and its implementing guidelines (State CEQA Guidelines), requiring that projects with potential adverse effects or impacts on the environment undergo environmental review. Adverse impacts to the environment are typically mitigated as a result of the environmental review process in accordance with existing laws and regulations.

Although threatened and endangered species are protected by specific federal and State statutes, CEQA Guidelines Section 15380(d) provides that a species not listed on the federal or State list of protected species may be considered rare or endangered if the species can be shown to meet certain specified criteria. These criteria have been modeled after the definition in ESA and the section of the California Fish and Game Code dealing with rare or endangered plants and animals. CEQA Guideline Section 15380(d) allows a public agency to undertake a review to determine if a significant effect would occur on species that have not yet been listed by either the USFWS or CDFW (i.e., species of concern). Thus, if warranted under special circumstances, CEQA provides an agency with the ability to protect a species from a project's potential impacts until the respective government agencies have an opportunity to designate the species as formally protected.

Pursuant to the requirements of CEQA, an agency reviewing a proposed project within its jurisdiction must determine whether any State-listed endangered or threatened species may be present in the project area and determine whether the proposed project will have a potentially significant impact on such species.

California Fish and Game Code

The CFG Code regulates the taking or possession of birds, mammals, fish, amphibians, and reptiles, as well as natural resources such as wetlands and waters of the State. The CFG Code includes the California Native Plant Protection Act (NPPA) of 1977 (Sections 1900-1913), which directed CDFW to carry out the Legislature's intent to "preserve, protect and enhance rare and endangered plants in this State."

Pursuant to CFG Code Section 3503, it is unlawful to take, possess, or needlessly destroy the nest or eggs of any bird, except as otherwise provided by the code or any regulation made pursuant thereto. Raptors (birds of prey) and owls and their active nests are protected by CFG Code Section 3503.5, which states that it is unlawful to take, possess, or destroy any birds of prey or to take, possess, or destroy the nest or eggs of any such bird unless authorized by the CDFW. In common practice, CDFW places timing restrictions on clearing of potential nesting habitat (e.g., vegetation), as well as restrictions on disturbances allowed near active raptor nests.

Porter-Cologne Water Quality Control Act

The SWRCB and the RWQCB regulate the discharge of waste to waters of the State via the 1969 Porter-Cologne Water Quality Control Act (Porter-Cologne) as described in the California Water Code (SWRCB 2008). The California Water Code is the State's version of the federal CWA. Waste, according to the California Water Code, 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.

State waters that are not federal waters may be regulated under Porter-Cologne. A Report of Waste Discharge must be filed with the RWQCB for projects that result in discharge of waste into waters of the State. The RWQCB will issue Waste Discharge Requirements (WDRs) or a waiver. The WDRs are the Porter-Cologne version of a Clean Water Act Section 401 Water Quality Certification.

SIGNIFICANCE OF PROJECT IMPACTS AND PROPOSED MITIGATION

This section provides a project-level biological resources impact analysis for the proposed project in support of environmental review. The issues addressed in this section are derived from Appendix G of the CEQA Guidelines. Mitigation, monitoring, and reporting requirements to eliminate or reduce project impacts to a less than significant level are also provided in this section.

Issue 1: Special-Status Species

Would the project 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 CDFW or USFWS?

Issue 1 Impact Analysis

Less than Significant Impact with Mitigation. As described below, the project could result in potential significant impacts to southern tarplant, silvery legless lizard, and Cooper's hawk. Impacts would be reduced to less than significant levels through the implementation of mitigation measures.

No other special-status plant or animal species have the potential to occur within the project site due to lack of suitable habitat; inappropriate soil conditions; inappropriate elevations; existing disturbances; prevalence of non-native plant species; local and regional isolation of the site; highly urbanized areas completely surrounding the site; adjacency with existing developments; past and ongoing disturbances, including noise, lighting, illegal dumping, pedestrian use, off-highway vehicle use, and evidence of occasional flooding; and evidence of domestic dog use.

Southern Tarplant

An estimated 350 to 400 southern tarplant have been reported as occurring on the site (Cooper 2014a). This species is known from four other locations within five miles of the project site, including two populations that located within existing preserve lands at the Harbor Lake Regional Park and Madrona Marsh Nature Preserve. Southern tarplant is not federally or State listed as endangered or threatened, but is designated as a CRPR 1B.1 rare plant species by the CNPS. The species has been afforded an element ranking score of G3T2/S2, which categorizes the species on a global and state level as being imperiled; at high risk of extinction due to very restricted range; associated with very few populations (often 20 or fewer); experiencing steep declines; or other factors. The ranking score reflects a combination of rarity, threat, and trend factors, with weighting being heavier on rarity than the other two. The project is expected to result in direct impacts to the majority of the estimated 350 to 400 southern tarplant individuals on the site. These impacts would be considered significant.

A southern tarplant mitigation plan has been prepared by the City to fully compensate impacts to the species (Attachment G). The plan proposes to establish an approximately 2.0-acre preserve for the southern tarplant in the western portions of the project site (Figure 12). Implementation of the plan will result in the enhancement of the 2.0-acre area by establishing appropriate grades to promote seasonal ponding and seeding the area with southern tarplant collected on the site prior to development. The preserve will be managed to protect its resources in perpetuity. The proposed mitigation will ensure the long-term survival of the species at the site and enhance the function of the seasonal pool already present onsite, which may then be used in the future by a variety of vernal pool, wetland and open-country species in the region.

Implementation of mitigation measure BIO-1 below would ensure that the tarplant mitigation plan for the project is adopted by the City for successful implementation and that tarplant impacts from the project are fully compensated through on-site relocation and preservation actions. Mitigation measures BIO-4 through BIO-7 would ensure that potential indirect impacts to preservation areas targeted for tarplant mitigation are avoided and minimized during construction activities. With the implementation of mitigation measure BIO-1 and BIO-4 through BIO-7, impacts to southern tarplant would be reduced to less than significant levels.

Silvery Legless Lizard

Silvery legless lizard has not been observed on the project site based on survey findings to date, although environmental conditions have not been optimal for detection. Silvery legless lizard is not federally or state listed as endangered or threatened, but is designated as a California species of special concern. It has a an element ranking score of G3G4T3T4Q S3, which categorizes the species on a global and state level as being vulnerable to apparently secure; uncommon but not rare; some cause for long-term concern due to declines or other factors; and at a moderate risk of extinction due to restricted range, relatively few populations (often 80 or fewer), recent and

widespread declines, or other factors. This species is relatively common and highly localized within urban Los Angeles County. Scattered sightings of legless lizard have been made in the Torrance/South Bay region, indicating they can persist where soil conditions are suitable in areas with high sand content and no recent major soil disturbance (Cooper 2014a). If present at the site, this species would likely only be present in very low numbers due to site's history of disturbance, small size, geographic isolation, and lack of high quality habitat. In the unlikely event that high numbers of the species occur, impacts could be considered potentially significant.

Implementation of mitigation measure BIO-2 would ensure that pre-work surveys and relocation efforts are employed prior to project construction to avoid and minimize impacts to the species. Mitigation measures BIO-4 through BIO-7 would further ensure that potential indirect impacts to preservation areas targeted for lizard relocation are avoided and minimized during construction activities. With the implementation of mitigation measure BIO-2 and BIO-4 through BIO-7, impacts to silvery legless lizard would be reduced to less than significant levels.

Cooper's Hawk

Cooper's hawk reported as being observed during a survey of the site on April 7, 2014 (Cooper 2014a). No active or inactive nests belonging to any raptor species have been observed on the site during surveys to date. Cooper's hawk is not federally or state listed as endangered or threatened. It was recently demoted to a watch list species, having previously been designated a California species of special concern. The species frequents urbanized areas in the region where suitable woodland habitat occurs for nesting. Cooper's hawk has the potential to forage over the site, but would not be expected to nest due to the lack of suitable trees. In the unlikely event that Cooper's hawk is found nesting on the site during project construction, impacts would be considered significant.

Implementation of mitigation measure BIO-3 below would ensure that nesting Cooper's hawks are not impacted by the project. With the implementation of mitigation measure BIO-3, impacts would be reduced to less than significant levels.

Nesting Birds

The project site contains trees, shrubs, and other vegetation that provide suitable nesting habitat for common birds, including raptors, protected under the MBTA and CFG Code. Construction of the proposed project could result in the removal or trimming of trees and other vegetation during the general bird nesting season (January 15 through September 15) and, therefore, could result in impacts to nesting birds in violation of the MBTA and CFG Code. Direct impacts could occur as a result of removal of vegetation supporting an active nest. Impacts would be considered significant.

Implementation of mitigation measure BIO-3 below would reduce potentially significant impacts on nesting birds and raptors to less than significant levels.

Issue 1 Mitigation Measures

BIO-1 Southern Tarplant Mitigation and Open Space Preserve. The City shall compensate the loss of southern tarplant and associated habitat through onsite restoration, creation, and preservation. A total of 2.0 acres in the northwestern portion of the site shall be designated as open space preserve and placed within a protective easement for conservation purposes, such as a restrictive covenant or conservation easement. Signage and fencing shall be provided at perimeter locations. Fencing design shall be developed to promote safety of life and property, prevent unauthorized access by pedestrians and vehicles into sensitive areas, and allow limited passage for wildlife species in the local area.

The City or successors and assigns shall fund the long-term management of the open space, which shall include implementation of area specific management directives for maintenance and biological monitoring. At a minimum, maintenance directives shall include trash removal, treatment of non-native invasive and exotic plants, maintenance of operation BMPs, and fencing and signage upkeep. At a minimum, biological monitoring directives shall include periodic botanical surveys, including botanical inventory and vegetation community assessment; general wildlife surveys; inspections for non-native invasive and exotic plants; inspections for pest and nuisance wildlife species; and reporting. Biological monitoring directives shall be performed by a qualified biologist.

BIO-2 Silvery Legless Lizard Avoidance. The City shall retain a qualified biologist to perform a pre-construction survey and relocation efforts for the slivery legless lizard. The survey shall be completed within 30 days of construction activities and during the appropriate times when the species is active and above ground. Individuals shall be relocated within the Open Space Preserve area established through the implementation of mitigation measure BIO-1 or an appropriate off-site location. Appropriate exclusion fencing shall be installed around the Open Space Preserve prior to the relocation efforts and in accordance with mitigation measure BIO-5.

BIO-3 Nesting Bird and Raptor Avoidance. If initial grading and vegetation removal activities (i.e., earthwork, clearing, and grubbing) must occur during the general bird breeding season for migratory birds and raptors (January 15 and September 15), the project applicant shall retain a qualified biologist to perform a pre-construction survey of potential nesting habitat to confirm the absence of active nests belonging to migratory birds and raptors afforded protection under the Migratory Bird Treaty Act and California Fish and Game Code. The pre-construction survey shall be performed no more than seven days prior to the commencement of the activities. If the qualified biologist determines that no active migratory bird or raptor nests occur, the activities shall be allowed to proceed without any further requirements. If the qualified biologist determines that an active migratory bird or raptor nest is present, no impacts shall occur until the young have fledged the nest and the nest is confirmed to no longer be active, as determined by the qualified biologist.

BIO-4 Preparation of Stormwater Pollution Prevention Plan. Prior to construction, the project Applicant shall develop a stormwater pollution prevention plan (SWPPP). The SWPPP shall be developed, approved, and implemented during construction to control stormwater runoff such that erosion, sedimentation, pollution, and other adverse effects are minimized. The following performance measures shall be implemented to avoid the release of toxic substances associated with urban runoff:

- Sediment shall be retained on site by a system of sediment basins, traps, or other appropriate measures.
- Where deemed necessary by the City and identified in the SWPPP, storm drains shall be equipped with silt and oil traps to remove oils, debris, and other pollutants. Storm drain inlets shall be labeled "No Dumping—Drains to Ocean." Storm drains shall be regularly maintained to ensure their effectiveness.
- The parking lots shall be designed to allow stormwater runoff to be directed to vegetative filter strips and/or oil-water separators to control sediment, oil, and other contaminants.
- Permanent energy dissipaters shall be included for drainage outlets.
- The BMPs contained in the SWPPP shall include, but are not limited to, silt fences, fiber rolls, gravel bags, and soil stabilization measures such as erosion control mats and hydro-seeding.
- The project area drainage basins will be designed to provide effective water quality control measures,. Design and operational features of the drainage basins will include design features to provide maximum infiltration and maximum detention time for settling of fine particles; maximize the distance between basin inlets and outlets to reduce velocities; and establish maintenance schedules for periodic removal of sedimentation, excessive vegetation, and debris.

BIO-5 Construction Fencing. Prior to construction, the City shall install temporary construction fencing around the perimeter of the Open Space Preserve and wherever the limits of grading are adjacent to sensitive vegetation communities or other biological resources, as identified by a qualified biologist. Fencing shall remain in place during all construction activities.

BIO-6 Best Management Practices. The City shall ensure that the construction contractor implements BMPs including but not limited to: maintaining the project area free of trash and debris; employing appropriate standard spill prevention practices and clean-up materials; installing and maintaining sediment and erosion control measures in accordance with an approved Storm Water Pollution Prevention Plan; maintaining effective control of fugitive dust; and properly storing, handling, and disposing of all toxins and pollutants including waste materials.

Prior to construction, the following notes shall be included on the applicable construction plans to the satisfaction of the City (or their designee):

- A qualified biologist shall be on site to monitor all vegetation clearing and periodically thereafter to ensure implementation of appropriate resource protection measures.
- Dewatering shall be conducted in accordance with standard regulations of the Regional Water Quality Control Board. A permit to discharge water from dewatering activities will be required. This will minimize erosion, siltation, and pollution within sensitive communities.
- During construction, material stockpiles shall be placed such that they cause minimal interference with on-site drainage patterns. This will protect sensitive vegetation from being inundated with sediment-laden runoff.
- Material stockpiles shall be covered when not in use. This will prevent fly-off that could damage nearby sensitive vegetation communities.
- Graded areas shall be periodically watered to minimize dust that may affect adjacent vegetation.

BIO-7 Biological Monitor. Prior to construction, for any areas adjacent to the Preserve, the City shall retain a qualified biologist to monitor a clearing, grubbing, and/or grading activities. The biological monitor shall attend pre-construction meetings and be present during the removal of any vegetation to ensure that the approved limits of disturbance are not exceeded and provide periodic monitoring of the impact area including, but not limited to, trenches, stockpiles, storage areas, and protective fencing. Before construction activities occur in areas containing sensitive biological resources, all workers shall be educated by the biologist to recognize and avoid those areas that have been marked as sensitive biological resources.

Issue 2: Sensitive Natural Communities

Would the project have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, and regulations or by the CDFW or USFWS?

Issue 2 Impact Analysis

Less than Significant Impact. The project site supports mule fat scrub and herbaceous wetland. Both of these communities occur in very small, isolated and disturbed stands located on portions of the site that used to be entirely developed and are now highly disturbed. They are relatively low in habitat quality due to disturbance and isolation from habitat blocks in the local and regional area. They are not associated with any permanent surface water or streambed feature. Neither community provides habitat for any special-status species, with the exception of southern tarplant.

The mule fat scrub is situated within an upland landscape position and the herbaceous wetland is associated with a man-made basin that was apparently excavated with the previous development on the site was demolished. Water quality and biophysical benefits of the isolated 0.01-acre area of herbaceous wetland are expected to be negligible due to the small size. The area would not be expected to accelerate groundwater recharge or have an important role in cycling nitrogen, sulfur, methane and carbon in the ecosystem. It would further not be expected to have any biophysical value to the ecosystem, as it has no connectivity to higher quality habitat, and would not be expected to substantially aid in filtering impurities on the site.

In their current state, the mule fat scrub and herbaceous wetland communities on the site are not considered sensitive. The project would establish an approximately 2.0 acre preserve onsite which, in addition to supporting southern tarplant, would be expected to support some elements of mule fat scrub and seasonal and/or herbaceous wetland. Therefore, impacts would be less than significant.

Issue 2 Mitigation Measures

No mitigation is required.

Issue 3: Wetlands

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

Issue 3 Impact Analysis

No Impact. The project site has no direct contact with federally protected wetlands. The site is generally self-contained and does not receive or discharge waters to any surface water bodies or drainage features nearby. No potential jurisdictional waters and wetlands were identified during the general biological survey. Lower elevations onsite are characterized by depressions and imprints in the land that were created by previous activities. The depressions have the potential to become inundated and hold water during wet years. The depressions are not considered to be vernal pools due to lack of vernal pool indicators. Therefore, no federally protected wetlands will be affected by the project and no mitigation is required.

Issue 3 Mitigation Measures

No mitigation is required.

Issue 4: Wildlife Movement and Nursery Sites

Would the project interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory corridors, or impede the use of native wildlife nursery sites?

Issue 4 Impact Analysis

Less than Significant Impact. No wildlife corridors or linkages occur on or in the immediate vicinity of the site. The project site does not support habitat that would contribute substantially to the assembly and function of any local or regional wildlife corridors or linkages. The project site is surrounded on all sides by highly urbanized land. It is locally and regionally isolated and separated from undeveloped land by expansive development. The habitat that exists is relatively low in quality and is disconnected and isolated from better quality habitat in the local and regional area. The site is completely enclosed with perimeter fencing. Animal species that require direct or less-constrained habitat connectivity along their travel routes would be challenged to find access to the habitat within the site and immediate vicinity. Due to the site's isolation and the fact there are no additional undeveloped parcels or habitat fragments in the local area, it does not function as a stepping-stone linkage and is not part of an archipelago chain of small open space patches amongst the urbanized area. At best, the project site is used as temporary or transient habitat by common resident and migratory birds with the ability to fly over long distances. Impacts to wildlife movement and nursery site would be less than significant and no mitigation is required.

Issue 4 Mitigation Measures

No mitigation is required.

Issue 5: Local Policies, Ordinances, and Adopted Plans

Would the project conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?

Issue 5 Impact Analysis

No Impact. The project would not conflict with any local policies or ordinances protecting biological resources. The project does not occur within a designated SEA and would not conflict with any County of Los Angeles policies or ordinances. The project would not conflict with any City policies or ordinances and no impact would occur.

Issue 5 Mitigation Measures

No mitigation is required.

Issue 6: Adopted Conservation Plans

Would the project conflict with the provisions of an adopted Habitat Conservation Plan, Natural Conservation Community Plan, or other approved local, regional, or state habitat conservation plan?

Issue 6 Impact Analysis

No Impact. The project site is not located within the boundaries of any adopted Habitat Conservation Plan, Natural Conservation Community Plan, or other approved local, regional, or state habitat conservation plan. The project would not conflict with such plans and no impact would occur.

Issue 6 Mitigation Measures

No mitigation is required.

We appreciate the opportunity to provide you with this letter report. Please do not hesitate to contact me at (619) 462-1515 or KarlO@helixepi.com if you have any questions or require further assistance.

Sincerely,

Karl L. Osmundson
Biology Group Manager / Principal Biologist

Enclosures:

Figure 1 – Regional Location Map
Figure 2 – Project Vicinity Map (Aerial Photograph)
Figure 3 – Project Vicinity Map (USGS Topography)
Figure 4 – Site Plan
Figure 5 – Topography (1/2-Foot Contour Data)
Figure 6 – Soils
Figure 7 – Vegetation Communities and Sensitive Resources
Figure 8 – Jurisdictional Delineation Data
Figure 9 – Frequency of Wet Season Inundation/Saturation from Sample Years
Figure 10 – Plot Locations
Figure 11 - Vegetation Communities and Sensitive Resources/Impacts
Figure 12 – Conceptual Preserve Area

Enclosures (cont.):

Attachment A – Plant and Animal Species Observed or Detected
Attachment B – Special-Status Species with Potential to Occur
Attachment C – Photographs
Attachment D – Aerial Imagery
Attachment E – Wetland Determination Data Forms
Attachment F – Federal and State Jurisdictional Information
Attachment G – Additional Biological Resources Documentation

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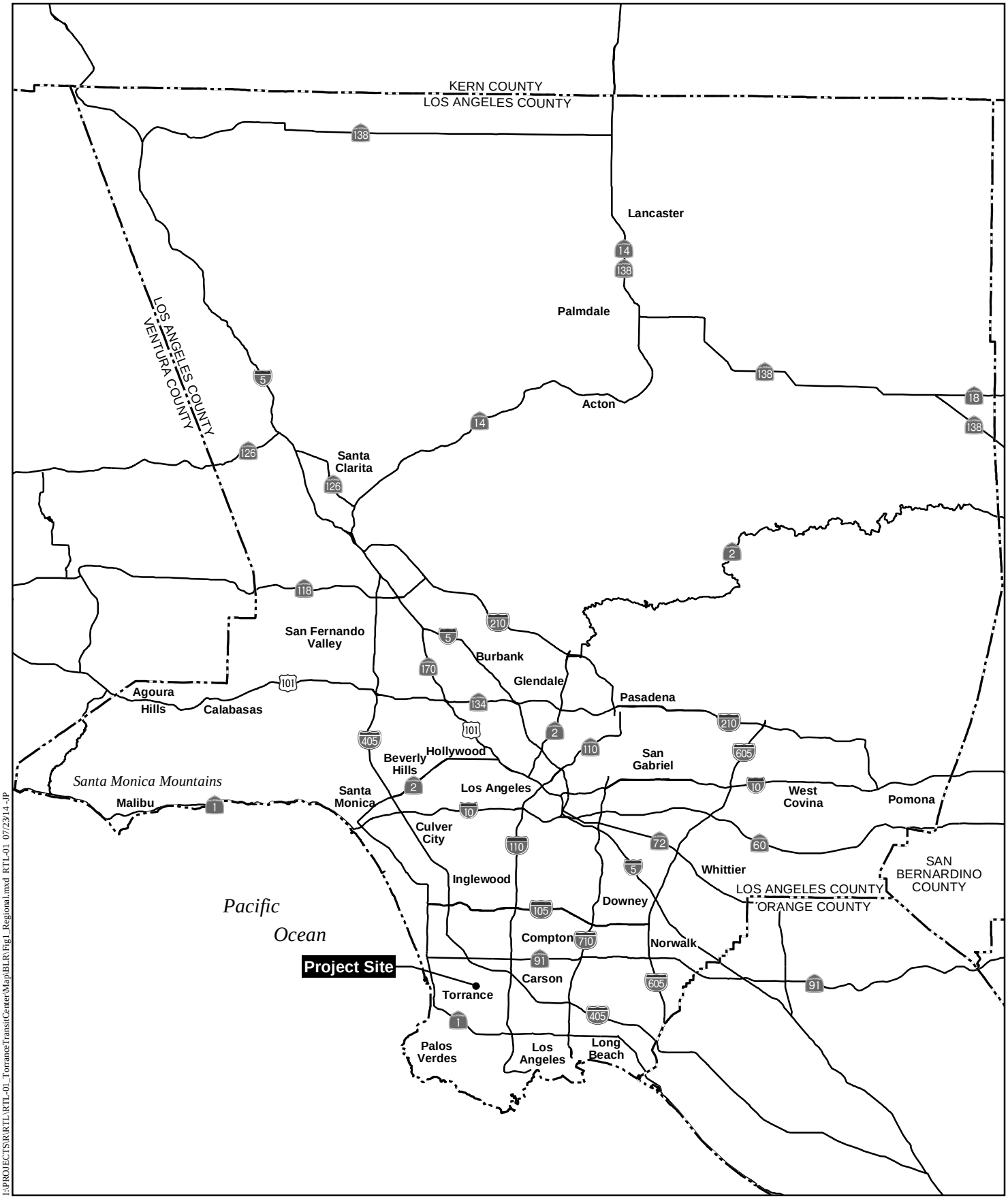

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Regional Location Map

TORRANCE TRANSIT PARK AND RIDE REGIONAL TERMINAL PROJECT

HELIX Environmental Planning

N 0 10 Miles

Figure 1

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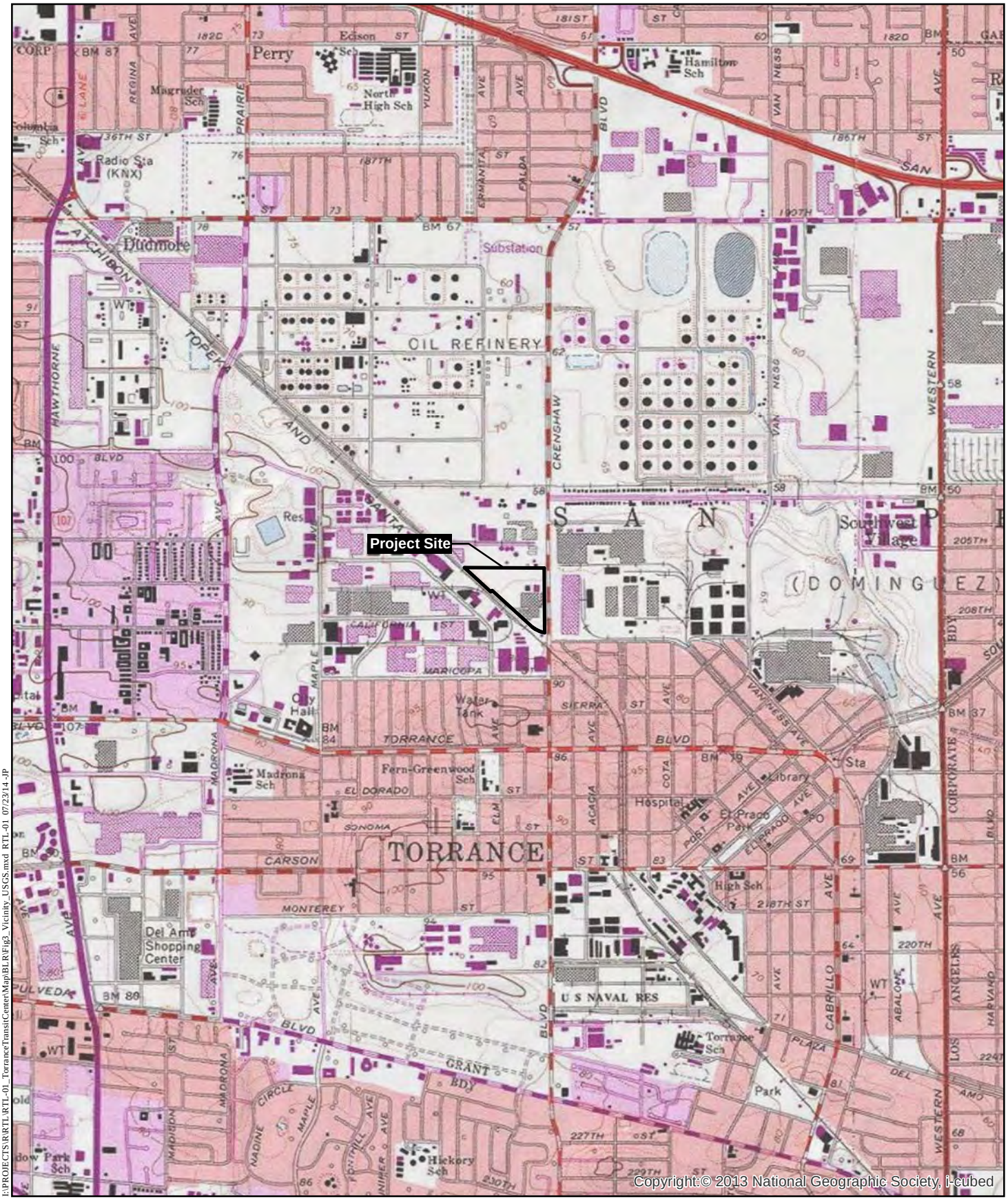
Project Vicinity Map (Aerial Photograph)

TORRANCE TRANSIT PARK AND RIDE REGIONAL TERMINAL PROJECT

HELIX Environmental Planning

N 0 2,000 Feet

Figure 2



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Project Vicinity Map (USGS Topography)

TORRANCE TRANSIT PARK AND RIDE REGIONAL TERMINAL PROJECT

HELIX Environmental Planning

N 0 2,000 Feet

Figure 3

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Site Plan

TORRANCE TRANSIT PARK AND RIDE REGIONAL TERMINAL PROJECT

HELIX Environmental Planning

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Figure 4

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Topography (1/2-Foot Contour Data)

TORRANCE TRANSIT PARK AND RIDE REGIONAL TERMINAL PROJECT

HELIX Environmental Planning

N 0 120 Feet

Figure 5

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Soils

TORRANCE TRANSIT PARK AND RIDE REGIONAL TERMINAL PROJECT

HELIX Environmental Planning

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Figure 6

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Vegetation Communities and Sensitive Resources

TORRANCE TRANSIT PARK AND RIDE REGIONAL TERMINAL PROJECT

HELIX Environmental Planning

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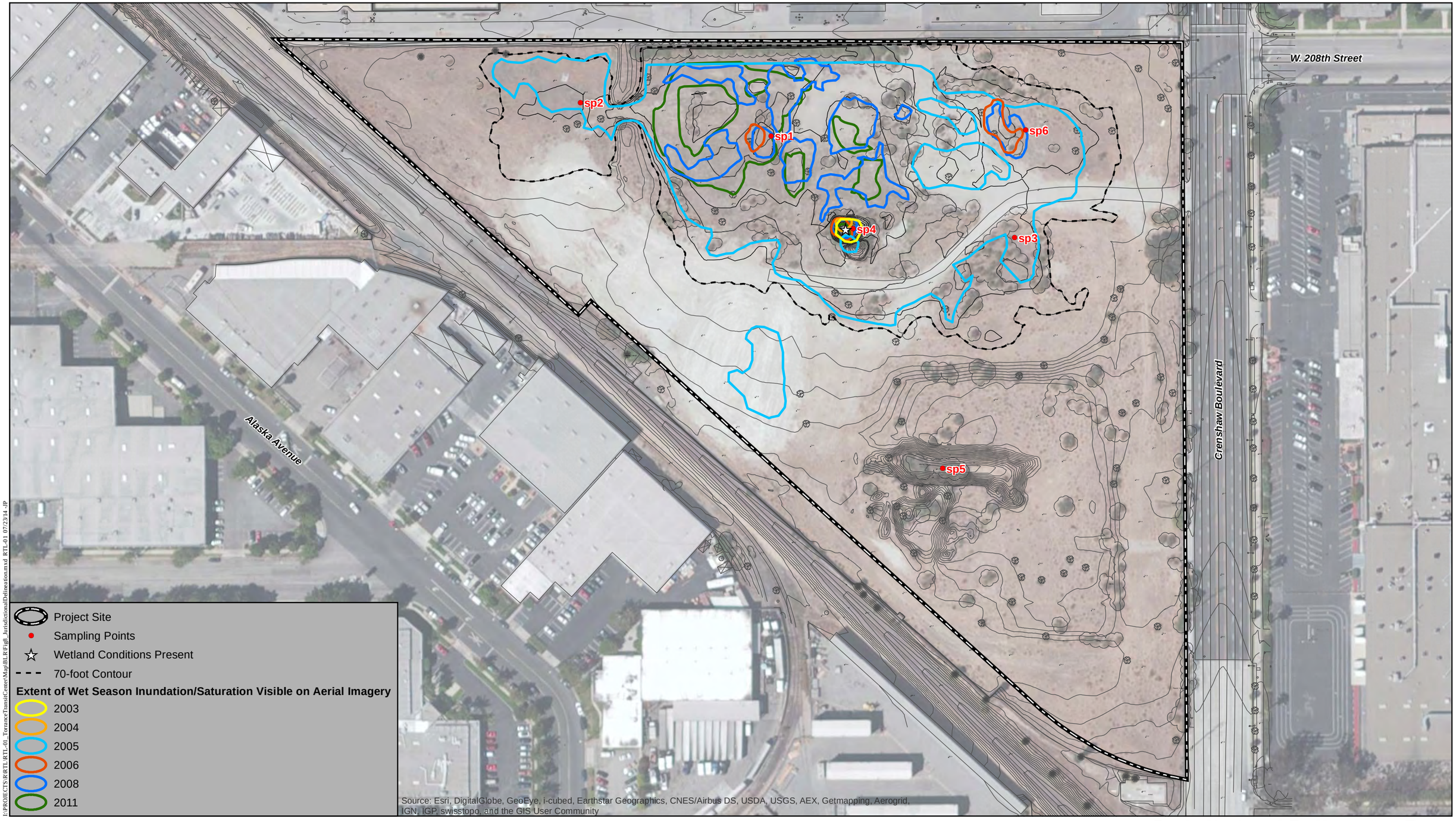
Figure 7



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Jurisdictional Delineation Data

TORRANCE TRANSIT PARK AND RIDE REGIONAL TERMINAL PROJECT

HELIX Environmental Planning

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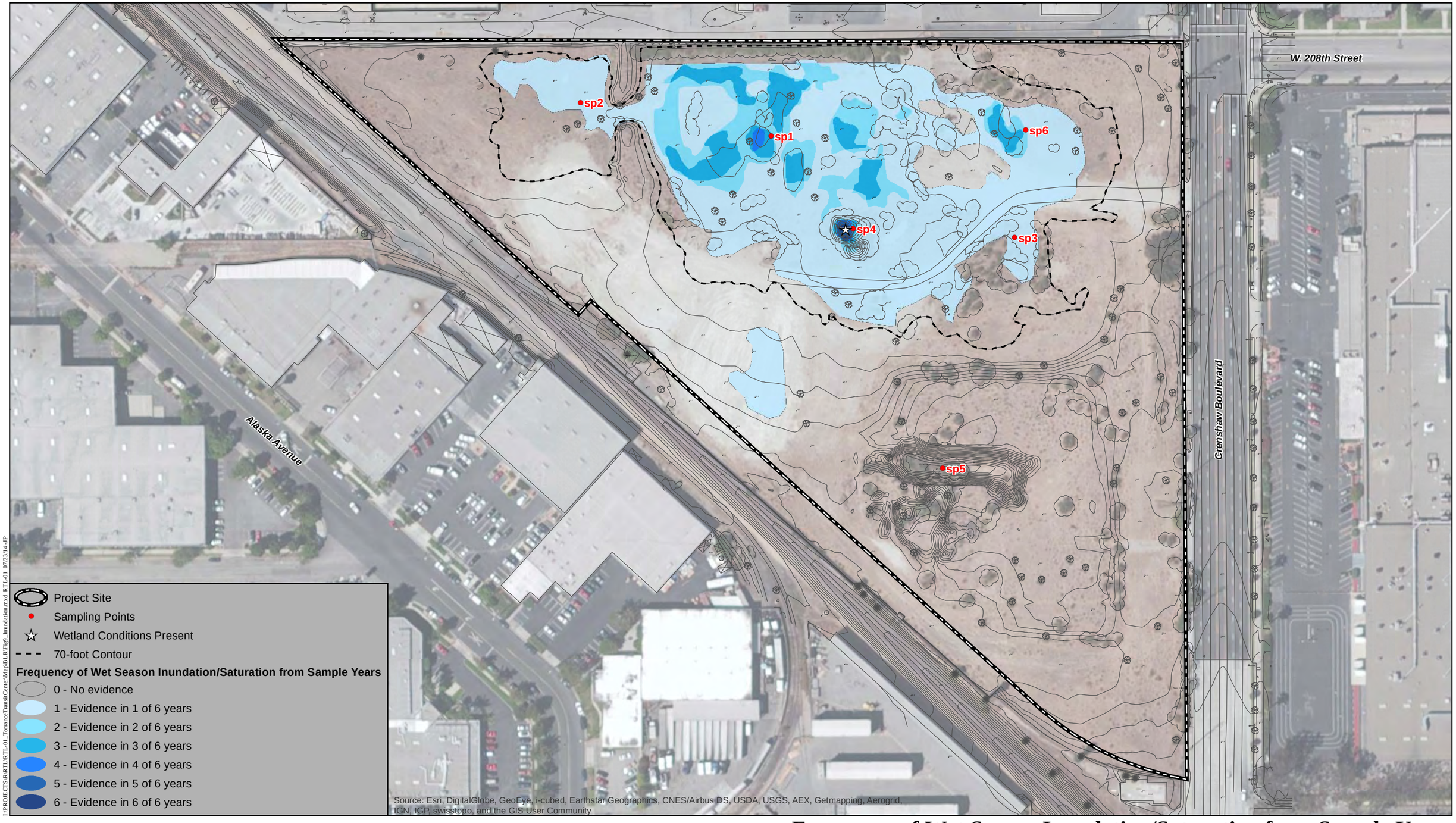
Figure 8



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Frequency of Wet Season Inundation/Saturation from Sample Years

TORRANCE TRANSIT PARK AND RIDE REGIONAL TERMINAL PROJECT

HELIX Environmental Planning

N 0 120 Feet

Figure 9

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Plot Locations

TORRANCE TRANSIT PARK AND RIDE REGIONAL TERMINAL PROJECT

HELIX Environmental Planning

N 0 120 Feet

Figure 10

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Vegetation Communities and Sensitive Resources/Impacts

TORRANCE TRANSIT PARK AND RIDE REGIONAL TERMINAL PROJECT

HELIX Environmental Planning

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Figure 11

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Conceptual Preserve Area

TORRANCE TRANSIT PARK AND RIDE REGIONAL TERMINAL PROJECT

HELIX Environmental Planning

N 0 200 Feet

Figure 12

Attachment A

PLANT AND ANIMAL SPECIES OBSERVED OR DETECTED

Attachment A
Plant Species Observed – Torrance Transit Center

Family	**Species Name**	**Common Name**
Dicots		
Apiaceae	*Foeniculum vulgare**	fennel
Asteraceae	*Baccharis pilularis*	coyote brush
	Baccharis salicifolia	mule fat
	Baccharis sp.	broom
	*Centaurea solstitialis**	yellow star-thistle
	Centromadia parryi ssp. *australis*†	southern tarplant
	Erigeron sp.*	fleabane
	*Glebionis coronaria**	garland daisy
	*Helminthotheca echioides**	bristly ox-tongue
	Heterotheca grandiflora	telegraph weed
	*Lactuca serriola**	wild lettuce
	*Leontodon taraxicoides**	lesser hawkbit
	Malacothrix saxatilis	cliff aster
	Pseudognaphalium sp.	everlasting
	Sonchus sp.*	sow thistle
Boraginaceae	*Amsinckia intermedia*	rancher's fiddleneck
	Cryptantha sp.	cryptantha
	Heliotropium curassavicum var. occulatum	salt heliotrope
Brassicaceae	*Brassica* sp.*	mustard
	*Capsella bursa-pastoris**	shepherd's purse
	*Hirschfeldia incana**	perennial mustard
	*Raphanus sativus**	wild radish
	*Sisymbrium irio**	London rocket
Caryophyllaceae	*Spergularia bocconi**	Boccone's sand spurry
Chenopodiaceae	*Amaranthus albus**	white tumbleweed
	*Atriplex semibaccata**	Australian saltbush
	*Salsola tragus**	Russian thistle
Convolvulaceae	*Convolvulus arvensis**	bindweed
Euphorbiaceae	*Chamaesyce albomarginata**	rattlesnake weed
	*Chamaesyce maculata**	spotted spurge
	Croton californicus	California croton
Fabaceae	*Acacia* sp.*	acacia
	Acmispon americanus	Spanish-clover
	Lupinus bicolor	miniature lupine

Attachment A (cont.)
Plant Species Observed – Torrance Transit Center

Family	Species Name	Common Name
Dicots (cont.)		
Fabaceae (cont.)	*Lupinus truncatus*	collar lupine
	Medicago polymorpha *	bur-clover
	*Medicago sativa**	alfalfa, lucerne
	*Melilotus albus**	white sweet clover
Geraniaceae	*Erodium cicutarium**	red-stem filaree
	*Erodium moschatum**	green-stem filaree
Malvaceae	*Malva neglecta**	common mallow
Myrtaceae	*Eucalyptus camaldulensis**	red gum
	Eucalyptus sp.*	eucalyptus
Onagraceae	*Oenothera laciniata**	cut-leaf evening primrose
Plantaginaceae	*Antirrhinum orontium**	Syrian snapdragon
Polygonaceae	*Polygonum aviculare* ssp. *depressum*	common knotweed
	*Rumex crispus**	curly dock
Rosaceae	*Cotoneaster* sp.*	cotoneaster
Salicaceae	*Salix gooddingii*	Goodding's black willow
	Salix lasiolepis	arroyo willow
Solanaceae	*Nicotiana glauca**	tree tobacco
	*Solanum nigrum**	black nightshade
Ulmaceae	*Ulmus parvifolia**	Chinese elm
Monocots		
Arecaceae	*Phoenix canariensis**	Canary Island date palm
	*Washingtonia robusta**	Mexican fan palm
Cyperaceae	*Bolboschoenus maritimus* ssp. *paludosus*	prairie bulrush
	Eleocharis macrostachya	pale spike-rush
Poaceae	*Avena fatua**	wild oat
	*Bromus diandrus**	common ripgut grass
	*Bromus madritensis**	foxtail chess
	*Cortaderia selloana**	pampas grass
	*Crypsis schoenoides**	prickle grass
	*Cynodon dactylon**	Bermuda grass
	*Echinochloa crus-galli**	common barnyard-grass
	*Festuca myuros**	fescue
	*Festuca perennis**	Italian ryegrass
	*Hordeum murinum**	barley

Attachment A (cont.)
Plant Species Observed – Torrance Transit Center

Family	**Species Name**	**Common Name**
Monocots (cont.)		
Poaceae (cont.)	*Lamarckia aurea**	goldentop
	*Pennisetum setaceum**	fountain grass
	*Polypogon monspeliensis**	annual beard grass
	*Stipa miliacea**	smilo grass
Pteridophytes		
Marsiliaceae	*Marsilea vestita* ssp. *vestita*	water fern

Attachment A (cont.)
Animal Species Observed – Torrance Regional Transit Center

Order/Family	Species Name	Common Name
Birds		
Order Accipitriformes		
Accipitridae	*Accipiter cooperi*†	Cooper's hawk
	Buteo jamaicensis	red-tailed hawk
	Buteo lineatus	red-shouldered hawk
Order Apodiformes		
Trochilidae	*Calypte anna*	Anna's hummingbird
	Selasphorus sasin	Allen's hummingbird
Order Charadriiformes		
Laridae	*Larus occidentalis*	western gull
Scolopacidae	*Gallinago delicata*	Wilson's snipe
Order Ciconiiformes		
Ardeidae	*Egretta thula*	snowy egret
Order Columbiformes		
Columbidae	*Columba decaocto*	Eurasian collared-dove
	Columba livia	rock dove
	Zenaida macroura	mourning dove
Order Falconiformes		
Falconidae	*Falco peregrinus*	peregrine falcon
	Falco sparverius	American kestrel
Order Passeriformes		
Aegithalidae	*Psaltriparus minimus*	bushtit
Corvidae	*Aphelocoma californica*	western scrub-jay
	Corvus brachyrhynchos	American crow
	Corvus corax	common raven
Emberizidae	*Pipilo crissalis*	California towhee
	Zonotrichia leucophrys	white-crowned sparrow
Estrildidae	*Lonchura punctulata*	nutmeg mannikin
Fringillidae	*Carduelis psaltria*	lesser goldfinch
	Carpodacus mexicanus	house finch
Hiruninidae	*Hirundo rustica*	barn swallow
	Petrochelidon pyrrhonota	cliff swallow
	Stelgidopteryx serripennis	northern rough-winged swallow
Icteridae	*Sturnella neglecta*	western meadowlark
Mimidae	*Mimus polyglottos*	northern mockingbird
Parulidae	*Geothlypis trichas*	common yellowthroat
	Setophaga coronata	yellow-rumped warbler
	Vermivora celata	orange-crowned warbler
	Wilsonia pusilla	Wilson's warbler
Passeridae	*Passer domesticus*	house sparrow
Sturnidae	*Sturnus vulgaris*	European starling

Attachment A (cont.)
Animal Species Observed – Torrance Regional Transit Center

Order/Family	Species Name	Common Name
Birds (cont.)		
Sylviidae	*Polioptila caerulea*	blue-gray gnatcatcher
Troglodytidae	*Troglodytes aedon*	house wren
Tyrannidae	*Myiarchus cinerascens*	ash-throated flycatcher
	Sayornis nigricans	black phoebe
	Sayornis saya	Say's phoebe
	Tyrannus verticalis	Western kingbird
Vireonidae	*Vireo gilvus*	warbling vireo
Order Piciformes		
Picidae	*Colaptes auratus*	northern flicker

†Sensitive species
*Non-native species

Attachment B

SPECIAL-STATUS SPECIES WITH POTENTIAL TO OCCUR

Attachment B
Torrance Regional Transit Center
Special-Status Species With Potential to Occur[1]

Species Name	Common Name	Status[2]	Habit, Ecology and Life History	Potential to Occur[3]
Plants				
Aphanisma blitoides	aphanisma	--/-- CRPR 1B.2	Small herb. Occurs in coastal sage scrub on coastal bluffs and beach dunes. Elevation range 20-200 ft. Flowering period Mar – Jun.	**None.** Restricted locally to Palos Verdes bluffs.
Astragalus tener var. *titi*	coastal dunes milkvetch	FE/SE CRPR 1B.1	Small herb. Occurs in wet areas on coastal dunes. Elevation range 10-180 ft. Flowering period Mar – May.	**None.** Suitable habitat does not occur on the project site.
Atriplex pacifica	south coast saltscale	--/-- CRPR 1B.2	Medium herb. Occurs in playa habitat in coastal sage scrub and alkali sinks. Elevation range 40-1600 ft. Flowering period Mar – Oct.	**None.** Restricted locally to Palos Verdes bluffs.
Atriplex parishii	Parish's brittlescale	--/-- CRPR 1B.1	Small herb. Occurs in playa and vernal pool habitats in shadscale scrub, alkali sinks, and freshwater wetlands. Elevation range 100-1650 ft. Flowering period Jun – Oct.	**None.** Extirpated from the Los Angeles area.
Atriplex serenana var. *davidsonii*	Davidon's saltscale	--/-- CRPR 1B.2	Small herb. Historically associated with isolated alkaline flats in valleys. Elevation range 0-1550 ft. Flowering period Apr – Oct.	**None.** Suitable habitat does not occur on the project site.

Attachment B
Torrance Regional Transit Center
Sensitive Species Potential to Occur[1]

Species Name	Common Name	Status[2]	Habit, Ecology and Life History	Potential to Occur[3]
Plants (cont.)				
Calochortus catalinae	Catalina mariposa-lily	--/-- CRPR 4.2	Small herb. Occurs in heavy clay soils in grasslands, foothill woodlands, and coastal sage scrub. Flowering period Mar – Jun. Elevation range 50-4700 ft.	**None.** Suitable habitat does not occur on the project site.
Calystegia peirsonii	Peirson's morning-glory	--/-- CRPR 4.2	Perennial herbaceous vine. Occurs in shadscale scrub, foothill woodland, yellow pine forest and sage scrub on the north side of the transverse ranges. Elevation range 1000-6000 ft. Flowering period Apr – Jun.	**None.** The project site is outside the species' range.
Centromadia parryi ssp. *australis*	southern tarplant	--/-- CRPR 1B.1	Medium herb. Occurs in seasonally moist alkaline areas in grasslands and on the periphery of salt marshes. Elevation range 0-1450 ft. Flowering period May – Nov.	**Presumed Present.** Observed during biological surveys.
Cordylanthus maritimus ssp. *maritimus*	salt marsh bird's-beak	FE/SE CRPR 1B.2	Small hemi-parasitic herb. Restricted to coastal salt marsh. Elevation range 0-3550 ft. Flowering period May – Oct.	**None.** Suitable habitat does not occur on the project site.
Dithyria maritima	beach spectaclepod	--/ST CRPR 1B.1	Small herb. Occurs in dunes and coastal strand. Elevation range 30-500 ft. Flowering period Mar – May.	**None.** Suitable habitat does not occur on the project site.
Lasthenia	Coulter's goldfields	--/--	Small herb. Occurs in salt marsh,	**None.** Suitable habitat does not

glabrata ssp. *coulterianum*		CRPR 1B.1	playa, and vernal pool habitats, in alkaline and salty soils. Elevation range 0-3650 ft. Flowering period Feb – Jun.	occur on the project site.
Nama stenocarpum	mud nama	--/-- CRPR 2B.2	Small herb. Occurs in muddy soil on lake margins and stream banks. Elevation range 0-2500 ft. Flowering period Jan – Jul.	**None.** Extirpated from the Los Angeles area.
Navarretia prostrata	prostrate vernal pool navarretia	--/-- CRPR 1B.1	Small herb. Restricted to vernal pools. Elevation range 60-2100 ft. Flowering period Apr – Jul.	**None.** Extirpated from the Los Angeles area.
Orcuttia californica	California Orcutt grass	FE/SE CRPR 1B.1	Small herb. Occurs in vernal pools. Elevation range 200-2200 ft. Flowering period Apr – Aug.	**None.** Suitable habitat does not occur on the project site.
Pentachaeta lyonii	Lyon's pentachaeta	--/-- CRPR 1B.1	Small herb. Occurs on thin, rocky soils in openings in chaparral and valley grasslands. Elevation range 250-1800 ft. Flowering period Mar – Aug.	**None.** Suitable habitat does not occur on the project site.
Phacelia stellaris	Brand's star phacelia	--/-- CRPR 1B.1	Small herb. Occurs in sandy openings in coastal sage scrub near the coast. Elevation range 0-1200 ft. Flowering period Mar – Jun.	**None.** Extirpated from the Los Angeles area.
Suaeda esteroa	estuary seablite	--/-- CRPR 1B.2	Medium shrub. Occurs on the edges of coastal salt marsh. Elevation range 0-400 ft. Flowering period May – Oct.	**None.** Suitable habitat does not occur on the project site.
Symphyotrichum defoliatum	San Bernardino aster	--/-- CRPR 1B.2	Medium herb. Occurs in vernally moist areas near marshes and seeps in grasslands, and along ditches and streams in cismontane woodland and coastal sage scrub. Elevation range 50-6700 ft.	**None.** Extirpated from the Los Angeles area.

			Flowering period Jul – Nov.	

Species Name	Common Name	Status[2]	Habit, Ecology and Life History	Potential to Occur[3]
Animals				
Invertebrates				
Brennania belkini	Belkin's dune tabanid fly	--/--	Small fly. Inhabits coastal dunes.	**Not Expected.** Suitable habitat does not occur on the project site.
Cicindela gabbii	Western tidal-flat tiger beetle	--/--	Small beetle. Inhabits coastal strand and estuaries.	**Not Expected.** Suitable habitat does not occur on the project site.
Cicindela hirticollis gravida	Sandy beach tiger beetle	--/--	Small beetle. Inhabits coastal strand and estuaries.	**Not Expected.** Suitable habitat does not occur on the project site.
Cicindela senilis frosti	senile tiger beetle	--/--	Small beetle. Inhabits coastal dunes.	**Not Expected.** Suitable habitat does not occur on the project site.
Danaus plexippus	Monarch butterfly	--/--	Winter migrant. Clusters in wind-protected areas near the coast with nectar plants nearby. Larvae develop on milkweeds (*Asclepias* spp.).	**Not Expected.** Suitable habitat does not occur on the project site.
Euphilotes battoides allyni	El Segundo blue butterfly	FE/--	Small butterfly. Inhabits coastal dunes near Los Angeles International Airport.	**Not Expected.** Suitable habitat does not occur on the project site.
Glaucopsyche lygdamus palosverdesensis	Palos Verdes blue butterfly	FE/--	Inhabits coastal prairies with foodplants in the Genus *Astragalus*.	**Not Expected.** Suitable habitat does not occur on the project site.
Raphiomidas terminates	El Segundo flower-loving fly	--/--		

terminatus				
Streptocephalus woottoni	Riverside fairy shrimp	FE/--	Freshwater branchiopod. Restricted to vernal pools.	**Presumed Absent.** Protocol surveys in 2014 were negative.
Tryonia imitator	Mimic tryonia (=California brackishwater snail)	--/--	Saltwater gastropod. Inhabits coastal lagoons, estuaries, and salt marshes in areas of permanent submergence.	**Not Expected.** Suitable habitat does not occur on the project site.
Reptiles				
Anniella pulchra pulchra	Silvery legless lizard	--/SSC	Inhabits areas with loose, sandy soil or leaf litter.	**High.** Suitable habitat occurs on the project site.
Thamnophis hammondii	Two-striped garter snake	--/SSC	Inhabits stream banks in foothills.	**Not Expected.** Suitable habitat does not occur on the project site.
Phrynosoma blainvillii	Coast horned lizard	--/SSC	Known in the Los Angeles Basin only from the El Segundo Dunes.	**Not Expected.** The project site is outside the species' known range.
Birds				
Accipiter cooperi	Cooper's hawk	--/--	Roosts in oak groves, mature riparian forest, and in tall eucalyptus trees.	**Presumed Present.** Observed during surveys in 2014.
Aquila chrysaetos	golden eagle	--/FP	Nests on cliff ledges or trees on steep slopes. Forages in large open grasslands. Avoids developed areas.	**Not Expected.** No nesting or wintering records within 60 miles of the project site.
Aythya americana	redhead	--/SSC	Duck. Inhabits deep freshwater marshes.	**Not Expected.** Suitable habitat does not occur on the project site.
Dendrocygna bicolor	fulvous whistling duck	--/SSC	Inhabits wetlands.	**Not Expected.** Believed to be extirpated from California.
Charadrius montanus	mountain plover	--/SSC	Inhabits large areas of arid grasslands.	**Not Expected.** Suitable habitat does not occur on the project site.
Coccyzus	western yellow-	FT/SE	Inhabits large patches of mature	**Not Expected.** Believed to be

americanus occidentalis	billed cuckoo		riparian woodland.	extirpated from California.
Passerculus sandwichensis beldingi	Belding's savannah sparrow	--/SE	Inhabits coastal salt marsh.	**Not Expected.** Suitable habitat does not occur on the project site.
Agelaius tricolor	tricolored blackbird	--/SSC	Inhabits freshwater marshes. No longer known to breed in Torrance. Known to winter in only 1 location in Torrance.	**Not Expected.** Suitable habitat does not occur on the project site.
Xanthocephalus xanthocephalus	yellow-headed blackbird	--/SSC	Inhabits freshwater marshes with large areas of open water.	**Not Expected.** Suitable habitat does not occur on the project site.
Chlidonias niger	black tern	--/SSC	Inhabits inland marshes as a winter migrant.	**Not Expected.** No longer breeds in southern California.
Sternula antillarum browni	California least tern	FE/SE; FP	Breeds on coastal strand and forages in coastal salt marshes.	**Not Expected.** Suitable habitat does not occur on the project site.
Dendroica petechia brewsteri	yellow warbler	--/SSC	Inhabits dense riparian scrub.	**Low.** Riparian habitat on the site is not of sufficient size or quality to support the species.
Rallus obsoletus [longirostris] levipes	light-footed Ridgeway's (clapper) rail	FE/SE; FP	Inhabits coastal salt marshes, especially those dominated by cordgrass (*Spartina* sp.), but has been known to use brackish and freshwater sites.	**Not Expected.** Suitable habitat does not occur on the project site.
Athene cunicularia	Burrowing owl	--/SSC	Ground-dwelling raptor. Inhabits large open areas with abundant rodent prey and suitable burrows.	**Not Expected.** Suitable habitat does not occur on the project site.
Polioptila californica californica	Coastal California gnatcatcher	FT/--	Occurs in coastal sage scrub.	**Not Expected.** Suitable habitat does not occur on the project site.
Pyrocephalus rubinus	Vermilion flycatcher	--/SSC	Occasionally present in coastal regions as a migrant. Breeds in	**Not Expected.** Suitable breeding habitat does not occur

			inland deserts.	on the project site.
Mammals				
Eumops perotis californicus	western mastiff bat	--/--	Large bat. Roosts in coast live oaks in chaparral and rocky cliffs in arid regions.	**Not Expected.** Suitable habitat does not occur on the project site.
Perognathus longimembris pacificus	Pacific pocket mouse	FE/SSC	Inhabits coastal strand and dunes. Known from Camp Pendleton and Dana Point.	**Not Expected.** Suitable habitat does not occur on the project site.
Nyctinomops femorosaccus	Pocketed free-tailed bat	--/SSC	Roosts in rock outcrops.	**Not Expected.** Suitable habitat does not occur on the project site.
Lasionycteris noctivagans	Silver-haired bat	--/--	Present as a migrant in coastal southern California. Breeds in forests.	**Not Expected.** Suitable breeding habitat does not occur on the project site.

[1]Sensitive species reported within 5 miles of the project site.

[2]Listing is as follows: F = Federal; S = State of California; E = Endangered; T = Threatened; R = Rare; FP = Fully Protected; BCC = Bird of Conservation Concern; SSC = State Species of Special Concern.

CRPR = California Rare Plant Rank: 1A – presumed extinct; 1B – rare, threatened, or endangered in California and elsewhere; 2A – rare, threatened, or endangered in California and elsewhere; 2B – rare, threatened, or endangered in California but more common elsewhere; 3 – more information needed; 4 – watch list for species of limited distribution. Extension codes: .1 – seriously endangered; .2 – moderately endangered; .3 – not very endangered.

[3]Potential to Occur is assessed as follows. **None**: Species is either sessile (*e.g.* plants) or so limited to a particular habitat that it cannot disperse on its own (*e.g.* fairy shrimp), and habitat suitable for its survival does not occur on the project site; **Not Expected**: Species moves freely and might disperse through or across the project site, but suitable habitat for residence or breeding does not occur on the project site; **Low**: Suitable habitat is present on the project site but is of low quality and no sign of the species was observed during surveys, however the species cannot be excluded with certainty; **High**: Suitable habitat occurs on the project site and the species has been recorded recently on or near the project site, but was not observed during surveys for the current project; **Presumed Present**: The species was observed during biological surveys for the current project and is assumed to occupy the project site. **Presumed Absent:** Valid protocol surveys for the species were negative and the species is assumed to not occupy the site.

Attachment C

PHOTOGRAPHS

Photo 1. Overview of central and eastern portions of the site, facing west. .

Photo 2. Overview of southern and eastern portions of the site, facing south.

Photo 3. Overview of northern and eastern portions of the site, facing northwest.

Photo 4. Overview of southern portions of the site, facing east.

Photo 5. View of large bare area in central portion of the site, facing northeast.

Photo 6. View of western portions of the site where the conceptual preserve is planned, facing northwest..

Photo 7. View of northern portions of the site, facing northeast.

Photo 8. View of northern portions of the site, facing east.

Photo 9. Sampling Point 1 taken at the second lowest depression in the northern portion of the site. This area was determined to not support wetland conditions based on the absence of hydrophytic vegetation and hydric soils.

10. Sampling Point 4 taken at the lowest-elevation, man-made basin or sump feature located within the 70-foot contour in the central portion of the site. The area was determined to support wetland conditions.

Attachment D

AERIAL IMAGERY

May 30, 1994

June 9, 2002

December 30, 2003

April 28, 2004

January 19, 2005

March 15, 2006

April 24, 2007

July 27, 2008

November 14, 2009

March 7, 2011

April 16, 2013

Attachment E

WETLAND DETERMINATION DATA FORMS

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Torrance RTC City/County: Torrance/LA Sampling Date: 7/3/14

Applicant/Owner: City of Torrance State: CA Sampling Point: SP1

Investigator(s): Larry Sward, Karl Osmundson Section, Township, Range: _____

Landform (hillslope, terrace, etc.): basin Local relief (concave, convex, none): concave Slope (%): <1

Subregion (LRR): C: Mediterranean California Lat: 1765582.29 N Long: 6461238.79 E Datum: NAD 83

Soil Map Unit Name: _____ NWI classification: _____

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

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

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

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

Hydrophytic Vegetation Present?	Yes _____	No _____	**Is the Sampled Area within a Wetland?** **Yes** _____ **No** ✓
Hydric Soil Present?	Yes _____	No ✓	
Wetland Hydrology Present?	Yes ✓	No _____	

Remarks:

SP1 located within NNG in lowest basin on site.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: r = 25)	Absolute % Cover	Dominant Species?	Indicator Status
1. none			
2.			
3.			
4.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: r = 15)			
1. none			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: r = 5)			
1. Avena barbata	20	yes	UPL
2. Salsola tragus	7	no	FACU
3. Bromus diandrus	5	no	UPL
4. Bromus madritensis ssp. rubens	5	no	UPL
5. Chamaesyce albomarginata	3	no	UPL
6. Brassica nigra	1	no	UPL
7. Hordeum murinum	2	no	FACU
8. Festuca myuros	2	no	UPL
	45 = Total Cover		
Woody Vine Stratum (Plot size: r = 15)			
1. none			
2.			
	_____ = Total Cover		

% Bare Ground in Herb Stratum 55 % Cover of Biotic Crust _____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species		x 2 =	
FAC species		x 3 =	
FACU species	9	x 4 =	36
UPL species	36	x 5 =	180
Column Totals:	45 (A)		216 (B)

Prevalence Index = B/A = 4.8

Hydrophytic Vegetation Indicators:

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** _____ **No** _____

Remarks:

SP1 located in center of lowest basin on site
NNG
*Lateral florets exceed the central

SOIL

Sampling Point: SP1

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-4	10YR 3/2.5	100					sd cl lm	
4-17	10YR 4/3	95	7.5 YR 4/6	2	C	M	clay	fill mix
	10YR 5/3	3						

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

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

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

Indicators for Problematic Hydric Soils[3]:

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

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** _____ **No** ✓

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

___ Surface Water (A1)
___ High Water Table (A2)
___ Saturation (A3)
___ Water Marks (B1) (**Nonriverine**)
___ Sediment Deposits (B2) (**Nonriverine**)
___ Drift Deposits (B3) (**Nonriverine**)
___ Surface Soil Cracks (B6)
✓ Inundation Visible on Aerial Imagery (B7)
___ Water-Stained Leaves (B9)
___ Salt Crust (B11)
___ Biotic Crust (B12)
___ Aquatic Invertebrates (B13)
___ Hydrogen Sulfide Odor (C1)
___ Oxidized Rhizospheres along Living Roots (C3)
___ Presence of Reduced Iron (C4)
___ Recent Iron Reduction in Tilled Soils (C6)
___ Thin Muck Surface (C7)
___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

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

Field Observations:

Surface Water Present? Yes _____ No ✓ Depth (inches): _____

Water Table Present? Yes _____ No ✓ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No ✓ Depth (inches): _____

Wetland Hydrology Present? **Yes** ✓ **No** _____

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

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Torrance RTC City/County: Torrance/LA Sampling Date: 7/3/14

Applicant/Owner: City of Torrance State: CA Sampling Point: SP1

Investigator(s): Larry Sward, Karl Osmundson Section, Township, Range: _____

Landform (hillslope, terrace, etc.): basin Local relief (concave, convex, none): concave Slope (%): <1

Subregion (LRR): C: Mediterranean California Lat: 1765582.29 N Long: 6461238.79 E Datum: NAD 83

Soil Map Unit Name: _____ NWI classification: _____

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

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

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

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

Hydrophytic Vegetation Present?	Yes _____	No _____	**Is the Sampled Area within a Wetland?** **Yes** _____ **No** ✓
Hydric Soil Present?	Yes _____	No ✓	
Wetland Hydrology Present?	Yes ✓	No _____	

Remarks:

SP1 located within NNG in lowest basin on site.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: r = 25)	Absolute % Cover	Dominant Species?	Indicator Status
1. none			
2.			
3.			
4.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: r = 15)			
1. none			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: r = 5)			
1. Avena barbata	20	yes	UPL
2. Salsola tragus	7	no	FACU
3. Bromus diandrus	5	no	UPL
4. Bromus madritensis ssp. rubens	5	no	UPL
5. Chamaesyce albomarginata	3	no	UPL
6. Brassica nigra	1	no	UPL
7. Hordeum murinum	2	no	FACU
8. Festuca myuros	2	no	UPL
	45 = Total Cover		
Woody Vine Stratum (Plot size: r = 15)			
1. none			
2.			
	_____ = Total Cover		

% Bare Ground in Herb Stratum 55 % Cover of Biotic Crust _____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species		x 2 =	
FAC species		x 3 =	
FACU species	9	x 4 =	36
UPL species	36	x 5 =	180
Column Totals:	45 (A)		216 (B)

Prevalence Index = B/A = 4.8

Hydrophytic Vegetation Indicators:

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** _____ **No** _____

Remarks:

SP1 located in center of lowest basin on site
NNG
*Lateral florets exceed the central

SOIL

Sampling Point: SP1

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-4	10YR 3/2.5	100					sd cl lm	
4-17	10YR 4/3	95	7.5 YR 4/6	2	C	M	clay	fill mix
	10YR 5/3	3						

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

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

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

Indicators for Problematic Hydric Soils[3]:

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

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** _____ **No** ✓

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

___ Surface Water (A1)
___ High Water Table (A2)
___ Saturation (A3)
___ Water Marks (B1) (**Nonriverine**)
___ Sediment Deposits (B2) (**Nonriverine**)
___ Drift Deposits (B3) (**Nonriverine**)
___ Surface Soil Cracks (B6)
✓ Inundation Visible on Aerial Imagery (B7)
___ Water-Stained Leaves (B9)
___ Salt Crust (B11)
___ Biotic Crust (B12)
___ Aquatic Invertebrates (B13)
___ Hydrogen Sulfide Odor (C1)
___ Oxidized Rhizospheres along Living Roots (C3)
___ Presence of Reduced Iron (C4)
___ Recent Iron Reduction in Tilled Soils (C6)
___ Thin Muck Surface (C7)
___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

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

Field Observations:

Surface Water Present? Yes _____ No ✓ Depth (inches): _____

Water Table Present? Yes _____ No ✓ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No ✓ Depth (inches): _____

Wetland Hydrology Present? **Yes** ✓ **No** _____

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

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Torrance RTC City/County: Torrance/LA Sampling Date: 7/3/14

Applicant/Owner: City of Torrance State: CA Sampling Point: SP1

Investigator(s): Larry Sward, Karl Osmundson Section, Township, Range: _____

Landform (hillslope, terrace, etc.): basin Local relief (concave, convex, none): concave Slope (%): <1

Subregion (LRR): C: Mediterranean California Lat: 1765582.29 N Long: 6461238.79 E Datum: NAD 83

Soil Map Unit Name: _____ NWI classification: _____

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

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

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

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

Hydrophytic Vegetation Present?	Yes _____	No _____	**Is the Sampled Area within a Wetland?** **Yes** _____ **No** ✓
Hydric Soil Present?	Yes _____	No ✓	
Wetland Hydrology Present?	Yes ✓	No _____	

Remarks:

SP1 located within NNG in lowest basin on site.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: r = 25)	Absolute % Cover	Dominant Species?	Indicator Status
1. none			
2.			
3.			
4.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: r = 15)			
1. none			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: r = 5)			
1. Avena barbata	20	yes	UPL
2. Salsola tragus	7	no	FACU
3. Bromus diandrus	5	no	UPL
4. Bromus madritensis ssp. rubens	5	no	UPL
5. Chamaesyce albomarginata	3	no	UPL
6. Brassica nigra	1	no	UPL
7. Hordeum murinum	2	no	FACU
8. Festuca myuros	2	no	UPL
	45 = Total Cover		
Woody Vine Stratum (Plot size: r = 15)			
1. none			
2.			
	_____ = Total Cover		

% Bare Ground in Herb Stratum 55 % Cover of Biotic Crust _____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species		x 2 =	
FAC species		x 3 =	
FACU species	9	x 4 =	36
UPL species	36	x 5 =	180
Column Totals:	45 (A)		216 (B)

Prevalence Index = B/A = 4.8

Hydrophytic Vegetation Indicators:

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** _____ **No** _____

Remarks:

SP1 located in center of lowest basin on site
NNG
*Lateral florets exceed the central

SOIL

Sampling Point: SP1

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-4	10YR 3/2.5	100					sd cl lm	
4-17	10YR 4/3	95	7.5 YR 4/6	2	C	M	clay	fill mix
	10YR 5/3	3						

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

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

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

Indicators for Problematic Hydric Soils[3]:

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

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** _____ **No** ✓

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

___ Surface Water (A1)
___ High Water Table (A2)
___ Saturation (A3)
___ Water Marks (B1) (**Nonriverine**)
___ Sediment Deposits (B2) (**Nonriverine**)
___ Drift Deposits (B3) (**Nonriverine**)
___ Surface Soil Cracks (B6)
✓ Inundation Visible on Aerial Imagery (B7)
___ Water-Stained Leaves (B9)
___ Salt Crust (B11)
___ Biotic Crust (B12)
___ Aquatic Invertebrates (B13)
___ Hydrogen Sulfide Odor (C1)
___ Oxidized Rhizospheres along Living Roots (C3)
___ Presence of Reduced Iron (C4)
___ Recent Iron Reduction in Tilled Soils (C6)
___ Thin Muck Surface (C7)
___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

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

Field Observations:

Surface Water Present? Yes _____ No ✓ Depth (inches): _____

Water Table Present? Yes _____ No ✓ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No ✓ Depth (inches): _____

Wetland Hydrology Present? **Yes** ✓ **No** _____

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

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Torrance RTC City/County: Torrance/LA Sampling Date: 7/3/14

Applicant/Owner: City of Torrance State: CA Sampling Point: SP1

Investigator(s): Larry Sward, Karl Osmundson Section, Township, Range: _____

Landform (hillslope, terrace, etc.): basin Local relief (concave, convex, none): concave Slope (%): <1

Subregion (LRR): C: Mediterranean California Lat: 1765582.29 N Long: 6461238.79 E Datum: NAD 83

Soil Map Unit Name: _____ NWI classification: _____

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

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

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

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

Hydrophytic Vegetation Present?	Yes _____	No _____	**Is the Sampled Area within a Wetland?** **Yes** _____ **No** ✓
Hydric Soil Present?	Yes _____	No ✓	
Wetland Hydrology Present?	Yes ✓	No _____	

Remarks:

SP1 located within NNG in lowest basin on site.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: r = 25)	Absolute % Cover	Dominant Species?	Indicator Status
1. none			
2.			
3.			
4.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: r = 15)			
1. none			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: r = 5)			
1. Avena barbata	20	yes	UPL
2. Salsola tragus	7	no	FACU
3. Bromus diandrus	5	no	UPL
4. Bromus madritensis ssp. rubens	5	no	UPL
5. Chamaesyce albomarginata	3	no	UPL
6. Brassica nigra	1	no	UPL
7. Hordeum murinum	2	no	FACU
8. Festuca myuros	2	no	UPL
	45 = Total Cover		
Woody Vine Stratum (Plot size: r = 15)			
1. none			
2.			
	_____ = Total Cover		

% Bare Ground in Herb Stratum 55 % Cover of Biotic Crust _____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species		x 2 =	
FAC species		x 3 =	
FACU species	9	x 4 =	36
UPL species	36	x 5 =	180
Column Totals:	45 (A)		216 (B)

Prevalence Index = B/A = 4.8

Hydrophytic Vegetation Indicators:

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** _____ **No** _____

Remarks:

SP1 located in center of lowest basin on site
NNG
*Lateral florets exceed the central

SOIL

Sampling Point: SP1

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-4	10YR 3/2.5	100					sd cl lm	
4-17	10YR 4/3	95	7.5 YR 4/6	2	C	M	clay	fill mix
	10YR 5/3	3						

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

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

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

Indicators for Problematic Hydric Soils[3]:

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

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** _____ **No** ✓

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

___ Surface Water (A1)
___ High Water Table (A2)
___ Saturation (A3)
___ Water Marks (B1) (**Nonriverine**)
___ Sediment Deposits (B2) (**Nonriverine**)
___ Drift Deposits (B3) (**Nonriverine**)
___ Surface Soil Cracks (B6)
✓ Inundation Visible on Aerial Imagery (B7)
___ Water-Stained Leaves (B9)
___ Salt Crust (B11)
___ Biotic Crust (B12)
___ Aquatic Invertebrates (B13)
___ Hydrogen Sulfide Odor (C1)
___ Oxidized Rhizospheres along Living Roots (C3)
___ Presence of Reduced Iron (C4)
___ Recent Iron Reduction in Tilled Soils (C6)
___ Thin Muck Surface (C7)
___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

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

Field Observations:

Surface Water Present? Yes _____ No ✓ Depth (inches): _____

Water Table Present? Yes _____ No ✓ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No ✓ Depth (inches): _____

Wetland Hydrology Present? **Yes** ✓ **No** _____

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

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Torrance RTC City/County: Torrance/LA Sampling Date: 7/3/14

Applicant/Owner: City of Torrance State: CA Sampling Point: SP1

Investigator(s): Larry Sward, Karl Osmundson Section, Township, Range: _____

Landform (hillslope, terrace, etc.): basin Local relief (concave, convex, none): concave Slope (%): <1

Subregion (LRR): C: Mediterranean California Lat: 1765582.29 N Long: 6461238.79 E Datum: NAD 83

Soil Map Unit Name: _____ NWI classification: _____

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

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

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

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

Hydrophytic Vegetation Present?	Yes _____	No _____	**Is the Sampled Area within a Wetland?** **Yes** _____ **No** ✓
Hydric Soil Present?	Yes _____	No ✓	
Wetland Hydrology Present?	Yes ✓	No _____	

Remarks:

SP1 located within NNG in lowest basin on site.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: r = 25)	Absolute % Cover	Dominant Species?	Indicator Status
1. none			
2.			
3.			
4.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: r = 15)			
1. none			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: r = 5)			
1. Avena barbata	20	yes	UPL
2. Salsola tragus	7	no	FACU
3. Bromus diandrus	5	no	UPL
4. Bromus madritensis ssp. rubens	5	no	UPL
5. Chamaesyce albomarginata	3	no	UPL
6. Brassica nigra	1	no	UPL
7. Hordeum murinum	2	no	FACU
8. Festuca myuros	2	no	UPL
	45 = Total Cover		
Woody Vine Stratum (Plot size: r = 15)			
1. none			
2.			
	_____ = Total Cover		

% Bare Ground in Herb Stratum 55 % Cover of Biotic Crust _____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species		x 2 =	
FAC species		x 3 =	
FACU species	9	x 4 =	36
UPL species	36	x 5 =	180
Column Totals:	45 (A)		216 (B)

Prevalence Index = B/A = 4.8

Hydrophytic Vegetation Indicators:

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** _____ **No** _____

Remarks:

SP1 located in center of lowest basin on site
NNG
*Lateral florets exceed the central

SOIL

Sampling Point: SP1

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-4	10YR 3/2.5	100					sd cl lm	
4-17	10YR 4/3	95	7.5 YR 4/6	2	C	M	clay	fill mix
	10YR 5/3	3						

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

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

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

Indicators for Problematic Hydric Soils[3]:

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

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** _____ **No** ✓

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

___ Surface Water (A1)
___ High Water Table (A2)
___ Saturation (A3)
___ Water Marks (B1) (**Nonriverine**)
___ Sediment Deposits (B2) (**Nonriverine**)
___ Drift Deposits (B3) (**Nonriverine**)
___ Surface Soil Cracks (B6)
✓ Inundation Visible on Aerial Imagery (B7)
___ Water-Stained Leaves (B9)
___ Salt Crust (B11)
___ Biotic Crust (B12)
___ Aquatic Invertebrates (B13)
___ Hydrogen Sulfide Odor (C1)
___ Oxidized Rhizospheres along Living Roots (C3)
___ Presence of Reduced Iron (C4)
___ Recent Iron Reduction in Tilled Soils (C6)
___ Thin Muck Surface (C7)
___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

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

Field Observations:

Surface Water Present? Yes _____ No ✓ Depth (inches): _____

Water Table Present? Yes _____ No ✓ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No ✓ Depth (inches): _____

Wetland Hydrology Present? **Yes** ✓ **No** _____

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

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Torrance RTC City/County: Torrance/LA Sampling Date: 7/3/14

Applicant/Owner: City of Torrance State: CA Sampling Point: SP1

Investigator(s): Larry Sward, Karl Osmundson Section, Township, Range: _____

Landform (hillslope, terrace, etc.): basin Local relief (concave, convex, none): concave Slope (%): <1

Subregion (LRR): C: Mediterranean California Lat: 1765582.29 N Long: 6461238.79 E Datum: NAD 83

Soil Map Unit Name: _____ NWI classification: _____

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

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

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

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

Hydrophytic Vegetation Present?	Yes _____	No _____	**Is the Sampled Area within a Wetland?** **Yes** _____ **No** ✓
Hydric Soil Present?	Yes _____	No ✓	
Wetland Hydrology Present?	Yes ✓	No _____	

Remarks:

SP1 located within NNG in lowest basin on site.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: r = 25)	Absolute % Cover	Dominant Species?	Indicator Status
1. none			
2.			
3.			
4.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: r = 15)			
1. none			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: r = 5)			
1. Avena barbata	20	yes	UPL
2. Salsola tragus	7	no	FACU
3. Bromus diandrus	5	no	UPL
4. Bromus madritensis ssp. rubens	5	no	UPL
5. Chamaesyce albomarginata	3	no	UPL
6. Brassica nigra	1	no	UPL
7. Hordeum murinum	2	no	FACU
8. Festuca myuros	2	no	UPL
	45 = Total Cover		
Woody Vine Stratum (Plot size: r = 15)			
1. none			
2.			
	_____ = Total Cover		

% Bare Ground in Herb Stratum 55 % Cover of Biotic Crust _____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species		x 2 =	
FAC species		x 3 =	
FACU species	9	x 4 =	36
UPL species	36	x 5 =	180
Column Totals:	45 (A)		216 (B)

Prevalence Index = B/A = 4.8

Hydrophytic Vegetation Indicators:

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** _____ **No** _____

Remarks:

SP1 located in center of lowest basin on site
NNG
*Lateral florets exceed the central

SOIL

Sampling Point: SP1

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-4	10YR 3/2.5	100					sd cl lm	
4-17	10YR 4/3	95	7.5 YR 4/6	2	C	M	clay	fill mix
	10YR 5/3	3						

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

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

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

Indicators for Problematic Hydric Soils[3]:

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

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** _____ **No** ✓

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

___ Surface Water (A1)
___ High Water Table (A2)
___ Saturation (A3)
___ Water Marks (B1) (**Nonriverine**)
___ Sediment Deposits (B2) (**Nonriverine**)
___ Drift Deposits (B3) (**Nonriverine**)
___ Surface Soil Cracks (B6)
✓ Inundation Visible on Aerial Imagery (B7)
___ Water-Stained Leaves (B9)
___ Salt Crust (B11)
___ Biotic Crust (B12)
___ Aquatic Invertebrates (B13)
___ Hydrogen Sulfide Odor (C1)
___ Oxidized Rhizospheres along Living Roots (C3)
___ Presence of Reduced Iron (C4)
___ Recent Iron Reduction in Tilled Soils (C6)
___ Thin Muck Surface (C7)
___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

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

Field Observations:

Surface Water Present? Yes _____ No ✓ Depth (inches): _____

Water Table Present? Yes _____ No ✓ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No ✓ Depth (inches): _____

Wetland Hydrology Present? **Yes** ✓ **No** _____

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

Remarks:

Attachment F

FEDERAL AND STATE JURISDICTIONAL INFORMATION

Attachment F
FEDERAL AND STATE JURISDICTIONAL INFORMATION

Wetlands and "Waters of the U.S." Definitions

The U.S. Army Corps of Engineers (USACE; Federal Register 1982) and the Environmental Protection Agency (Federal Register 1980) jointly define wetlands as "[t]hose areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions" (Environmental Laboratory 1987).

The official definition of "Waters of the U.S." and their limits of jurisdiction (as they may apply) are defined by the USACE' Regulatory Program Regulations (Section 328.3, paragraphs [a] 1-3 and [e], and Section 328.4, paragraphs [c] 1 and 2) as follows:

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; all waters including interstate wetlands, all other waters such as interstate lakes, rivers, streams [including intermittent streams], mudflats, sandflats, wetlands, sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds, the use, degradation or destruction of which could affect interstate commerce including any such water, which are or could be used by interstate travelers for recreation or other purposes; or from which fish or shellfish are or could be taken and sold in interstate commerce; or which are or could be used for industries in interstate commerce; or wetlands adjacent to waters [other than waters that are themselves wetlands].

Non-tidal Waters of the U.S. The limits of jurisdiction in non-tidal waters: In the absence of adjacent wetlands, the jurisdiction extends to the ordinary high water mark, or when adjacent wetlands are present, the jurisdiction extends to the limit of the adjacent wetlands.

The term ordinary high water mark (OHWM) means 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 (scouring), the presence of litter and debris, or other appropriate means that consider the characteristics of the surrounding areas.

Waters of the U.S. must exhibit an OHWM or other evidence of surface flow created by hydrologic physical changes. These physical changes include (Riley 2005):

- Natural line impressed on the bank
- Shelving
- Changes in the character of soil
- Destruction of terrestrial vegetation
- Presence of litter and debris
- Wracking
- Vegetation matted down, bent, or absent
- Sediment sorting
- Leaf litter disturbed or washed away
- Scour
- Deposition
- Multiple observed flow events
- Bed and banks
- Water staining
- Change in plant community

Jurisdictional areas also must be connected to Waters of the U.S. (Guzy and Anderson 2001; U.S. Supreme Court 2001).

As a consequence of the U.S. Supreme Court decision in Rapanos v. United States, a memorandum was developed regarding Clean Water Act jurisdiction (Grumbles and Woodley 2007). The memorandum states that the EPA and the USACE will assert jurisdiction over traditional navigable waters (TNW), wetlands adjacent to TNW, tributaries to TNWs that are a relatively permanent water body (RPW), and wetlands adjacent to TNW. An RPW has year round flow or continuous seasonal flow (i.e., typically for three months or longer). Jurisdiction over other waters (i.e., non TNW and RPW) will be based on a fact specific analysis to determine if they have a significant nexus to a TNW.

Pursuant to the USACE Instructional Guidebook (USACE and EPA 2007), the significant nexus evaluation will cover the subject reach of the stream (upstream and downstream) as well as its adjacent wetlands (Illustrations 2 through 6, USACE and EPA 2007). The evaluation will include the flow characteristics, annual precipitation, ability to provide habitat for aquatic species, ability to retain floodwaters and filter pollutants, proximity of the subject reach to a TNW, drainage area, and the watershed.

Wetland Criteria

Wetland boundaries are determined using three mandatory criteria (hydrophytic vegetation, wetland hydrology, and hydric soil) established for wetland delineations and described within the Wetlands Delineation Manual (Environmental Laboratory 1987) and the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region (USACE 2008). Following is a brief discussion of the three criteria and how they are evaluated.

Vegetation

"Hydrophytic vegetation is defined herein as the sum total of macrophytic plant life that occurs in areas where the frequency and duration of inundation or soil saturation produce permanently or periodically saturated soils of sufficient duration to exert a controlling influence on the plant species present" (Environmental Laboratory 1987).

The wetland indicator status (obligate upland, facultative upland, facultative, facultative wetland, obligate wetland, or no indicator status) of the dominant plant species of all vegetative layers is determined. Species considered to be hydrophytic include the classifications of facultative,

facultative wetland, and obligate wetland as defined by the U.S. Fish and Wildlife Service (1988; Table A-1). The percent of dominant wetland plant species is calculated. The hydrophytic vegetation criterion is considered to be met if it meets the "Dominance Test," "Prevalence Index," or the vegetation has morphological adaptations for prolonged inundation.

Table A-1
DEFINITIONS OF PLANT INDICATOR CATEGORIES

INDICATOR CATEGORIES	ABBREVIATION	PROBABILITY OF OCCURRING IN WETLANDS
Obligate wetland	OBL	Occur almost exclusively in wetlands (99 percent probability of occurring in a wetland).
Facultative wetland	FACW	Usually found in wetlands (67 to 99 percent probability of occurring in a wetland) but occasionally in uplands.
Facultative	FAC	Equally likely to occur in wetland (34 to 66 percent probability) or non-wetland.
Facultative upland	FACU	Usually occur in non-wetlands but occasionally found in wetlands (1 to 33 percent probability of occurring in a wetland).
Obligate upland	UPL	Occur almost exclusively in non-wetlands (1 percent probability of occurring in a wetland).

Hydrology

"The term 'wetland hydrology' encompasses all hydrologic characteristics of areas that are periodically inundated or have soils saturated to the surface at some time during the growing season. Areas with evident characteristics of wetland hydrology are those where the presence of water has an overriding influence on characteristics of vegetation and soils due to anaerobic reducing conditions, respectively" (Environmental Laboratory 1987).

Hydrologic characteristics must indicate that the ground is saturated to within 12 inches of the surface for at least 5 percent of the growing season during a normal rainfall year (approximately 18 days for most of low-lying southern California). Hydrology criteria are evaluated based on the characteristics listed below (USACE 2008). Where positive indicators of wetland hydrology are present, the limit of the OHWM (or the limit of adjacent wetlands) is noted and mapped. Evidence of wetland hydrology is met by the presence of a single primary indicator or two secondary indicators.

Primary

- surface water (A1)
- high water table (A2)
- saturation (A3)
- water marks (B1; non-riverine)
- sediment deposits (B2; non-riverine)
- drift deposits (B3; non-riverine
- surface soil cracks (B6)
- inundation visible on aerial imagery (B7)
- water-stained leaves (B9)
- salt crust (B11)
- biotic crust (B12)
- aquatic invertebrates (B13)
- hydrogen sulfide odor (C1)
- oxidized rhizospheres along living roots (C3)
- presence of reduced iron (C4)
- recent iron reduction in tilled soils (C6)
- thin muck surface (C7)

Secondary

- watermarks (B1; riverine)
- sediment deposits (B2; riverine)
- drift deposits (B3; riverine)
- drainage patterns (B10)
- dry-season water table (C2)
- crayfish burrows (C8)
- saturation visible on aerial imagery (C9)
- shallow aquitard (D3)
- FAC-neutral test (D5)

In the absence of all other hydrologic indicators and in the absence of significant modifications of an area's hydrologic function, positive hydric soil characteristics are assumed to indicate positive wetland hydrology. This assumption applies unless the site visit was done during the wet season of a normal or wetter-than-normal year. Under those circumstances, wetland hydrology would not be present.

Soils

"A hydric soil is a soil that formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part" (Natural Resource Conservation Service [NRCS] 2004).

Soils must exhibit physical and/or chemical characteristics indicative of permanent or periodic saturation. Soil matrix and mottle colors are identified at each sampling plot using a Munsell soil color chart (Kollmorgen 1994). Generally, an 18-inch or deeper pit is excavated with a shovel at each sampling plot unless refusal occurs above 18 inches.

Soils in each area are closely examined for hydric soil indicators, including the characteristics listed below. Hydric soil indicators are presented in three groups. Indicators for "All Soils" (A) are used in any soil regardless of texture, indicators for "Sandy Soils" (S) area used in soil layers with USDA textures of loamy fine sand or coarser, and indicators for "Loamy and Clayey Soils" (F) are used with soil layers of loamy very fine sand and finer (USACE 2008).

- histosols (A1)
- histic epipedons (A2)
- black histic (A3)
- hydrogen sulfide (A4)
- stratified layers (A5)
- 1 cm muck (A9)
- depleted below dark surface (A11)
- thick dark surface (A12)
- sandy mucky mineral (S1)
- sandy gleyed matrix (S4)
- sandy redox (S5)
- stripped matrix (S6)
- loamy mucky mineral (F1)
- loamy gleyed matrix (F2)
- depleted matrix (F3)
- redox dark surface (F6)
- depleted dark surface (F7)
- redox depressions (F8)
- vernal pools (F9)
- 2 cm muck (A10)
- reduced vertic (F18)
- red parent material (TF2)

Hydric soils may be assumed to be present in plant communities that have complete dominance of obligate or facultative wetland species. In some cases, there is only inundation during the growing season and determination must be made by direct observation during that season, recorded hydrologic data, testimony of reliable persons, and/or indication on aerial photographs.

Non-wetland Waters of the U.S.

The non-wetland Waters of the U.S. designation is met when an area has periodic surface flows but lacks sufficient indicators to meet the hydrophytic vegetation and/or hydric soils criteria. For purposes of delineation and jurisdictional designation, the non-wetland Waters of the U.S. boundary in non-tidal areas is the OHWM as described in the Section 404 regulations (33 CFR Part 328).

USGS Mapping

The USGS Quad maps are one of the resources used to aid in the identification and mapping of jurisdictional areas. Their primary uses include understanding the subregional landscape position of a site, major topographical features, and a project's position in the watershed.

In our experience the designation of watercourse as a blue-line stream (intermittent or perennial) on USGS maps has been unreliable and typically overstates the hydrology of most streams. This has also been the experience of others, including the late Luna Leopold. Leopold was a hydrologist with USGS from 1952 to 1972, Professor in the Department of Geology and Geophysics, and Department of Landscape Architecture, University of California, Berkeley from 1972 to 1986, and Professor Emeritus from 1987 until his death in 2006. In regard to stream mapping on USGS maps, Dr. Leopold opined that ". . . blue lines on a map are drawn by nonprofessional, low-salaried personnel. In actual fact, they are drawn to fit a rather personalized aesthetic."

California Department of Fish and Wildlife Regulations

The California Department of Fish and Wildlife (CDFW; Department) regulates alterations or impacts to streambeds or lakes (wetlands) under Fish and Game Code Sections 1600 through 1616 for any private, state, or local government or public utility-initiated projects. The Fish and Game Code Section 1602 requires any entity to notify the Department before beginning any activity that will do one or more of the following: (1) substantially obstruct or divert the natural flow of a river, stream, or lake; (2) substantially change or use any material from the bed, channel, or bank of a river, stream, or lake; or (3) deposit or dispose of debris, waste, or other material containing crumbled, flaked, or ground pavement where it can pass into a river, stream, or lake. Fish and Game Code Section 1602 applies to all perennial, intermittent, and ephemeral rivers and streams as well as lakes in the state.

In order to notify the Department, a person, state, or local governmental agency or public utility must submit a complete notification package and fee to the Department regional office that serves the county where the activity will take place. A fee schedule is included in the notification package materials. Under the Permit Streamlining Act (Government Code Sections 65920 et seq.), the Department has 30 days to determine whether the package is complete. If the requestor is not notified within 30 days, the application is automatically deemed to be complete.

Once the notification package is deemed to be complete, the Department will determine whether the applicant will need a Lake or Streambed Alteration Agreement (SAA) for the activity, which will be required if the activity could substantially adversely affect an existing fish and wildlife resource. If an SAA is required, the Department will conduct an on-site inspection, if necessary, and submit a draft SAA that will include measures to protect fish and wildlife resources while conducting the project. If the applicant is applying for a regular SAA (less than five years), the Department will submit a draft SAA within 60 calendar days after notification is deemed complete. The 60-day time period does not apply to notifications for long-term SAAs (greater than 5 years).

After the applicant receives the SAA, the applicant has 30 calendar days to notify the Department whether the measures in the draft SAA are acceptable. If the applicant agrees with the measures included in the draft SAA, the applicant will need to sign the SAA and submit it to the Department. If the applicant disagrees with any measures in the draft SAA, the applicant must notify the Department in writing and specify the measures that are not acceptable. Upon written request, the Department will meet with the applicant within 14 calendar days of receiving the request to resolve the disagreement. If the applicant fails to respond in writing within 90 calendar days of receiving the draft SAA, the Department may withdraw that SAA. The time periods described above may be extended at any time by mutual agreement.

After the Department receives the signed draft SAA, the Department will make it final by signing the SAA; however, the Department will not sign the SAA until it both receives the notification fee and ensures that the SAA complies with the California Environmental Quality

Act (Public Resources Code Section 21000 et seq.). After the applicant receives the final agreement, the applicant may begin the project the agreement covers, provided that the applicant has obtained any other necessary federal, state and/or local authorizations.

Water Resource Control Board Regulations

Section 401 Water Quality Certification

Whenever a project requires a federal Clean Water Act (CWA) Section 404 permit or a Rivers and Harbors Act Section 10 permit, it must first obtain a CWA Section 401 Water Quality Certification. The Regional Water Quality Control Board (RWQCB) administers the 401 Certification program. Federal CWA Section 401 requires that every applicant for a Section 404 permit must request a Water Quality Certification that the proposed activity will not violate state and federal water quality standards.

Porter-Cologne Water Quality Control Act

The State Water Resource Control Board (SWRCB) and the RWQCB regulate the discharge of waste to waters of the State via the 1969 Porter-Cologne Water Quality Control Act (Porter-Cologne) as described in the California Water Code (SWRCB 2008). The California Water Code is the State's version of the Federal CWA. Waste, according to the California Water Code, 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. State waters that are not federal waters may be regulated under Porter-Cologne. A Report of Waste Discharge must be filed with the RWQCB for projects that result in discharge of waste into waters of the State. The RWQCB will issue Waste Discharge Requirements (WDRs) or a waiver. The WDRs are the Porter-Cologne version of a CWA 401 Water Quality Certification.

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Attachment G

ADDITIONAL BIOLOGICAL RESOURCES DOCUMENTATION

Final Biological Assessment

Torrance Regional Transit Center Site

465 Crenshaw Boulevard
Torrance, CA 90503

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September 4, 2014

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Appendix 18

Introduction

This assessment summarizes biological information for the proposed Torrance Regional Transit Center (hereafter "RTC'), to be located along Crenshaw Blvd. south of W. 208th St. in the City of Torrance. It is intended to be complimentary to the "Southern Tarplant Mitigation Plan" (Cooper, in prep.) that focused on a single, protected species at the site (southern tarplant *Centromadia parryi* ssp. *australis*). The RTC site is a now-vacant, 15-acre lot along Crenshaw Blvd. in Torrance, which, prior to 2000, featured an industrial facility ("Pacific Plate and Glass") with buildings and parking lots, and only a small area at the far northwestern corner undeveloped.

Here we summarize the flora and fauna of the site, as known from several visits since January 2011 by city of Torrance staff (Tracy Drake, manager of the nearby Madrona Marsh Preserve) and since May 2013 by biologist Daniel S. Cooper (Cooper Ecological Monitoring, Inc., under contract with city of Torrance starting in 2013). Lists of known flora and fauna to date are found in Tables A1 and A2. These visits have been made throughout the year, and provide a general baseline of the plant and animal community present; however, they lack the rigor of a protocol-level wetland delineation or rare plant survey, neither of which could be performed since the area has not received significant precipitation since 2013.

Visits to RTC site by Daniel S. Cooper, CEM, Inc.:

- May 13, 2013 (11:00-13:00)
- July 29, 2013 (8:10-09:30)
- September 10, 2013 (10:30-11:30)
- December 10, 2013 (9:30-11:00)
- January 24, 2014 (brief; late morning with City of Torrance/CDFW staff)
- April 7, 2014 (8:30-9:45)

Existing Conditions

[Note: this section repeats information from Cooper, in prep. but is provided here for context.]

The RTC site is a triangle-shaped property of 15 acres, located on the west side of Crenshaw Blvd. and south of West 208th Street in the City of Torrance (Figure 1). It is entirely fenced/locked on all sides and receives little human visitation. The nearest undeveloped land is around ½ mile to the northwest, a 31-acre undeveloped lot (owned by Exxon/Mobil Oil Corp.) at the northeastern corner of Del Amo Blvd. and Prairie Ave. Madrona Marsh Preserve (44 acres) lies roughly a mile to the south. At late as 1999, most of the site (except for the far northwestern corner) was occupied by a paint factory ("PPG Industries, Inc." Figure 2), which was removed entirely by 2000. This process required considerable

environmental remediation, including soil removal, which took place in subsequent years. For at least the past 10 years, the site has been relatively undisturbed, except for occasional weed abatement (mowing, grazing by goats).

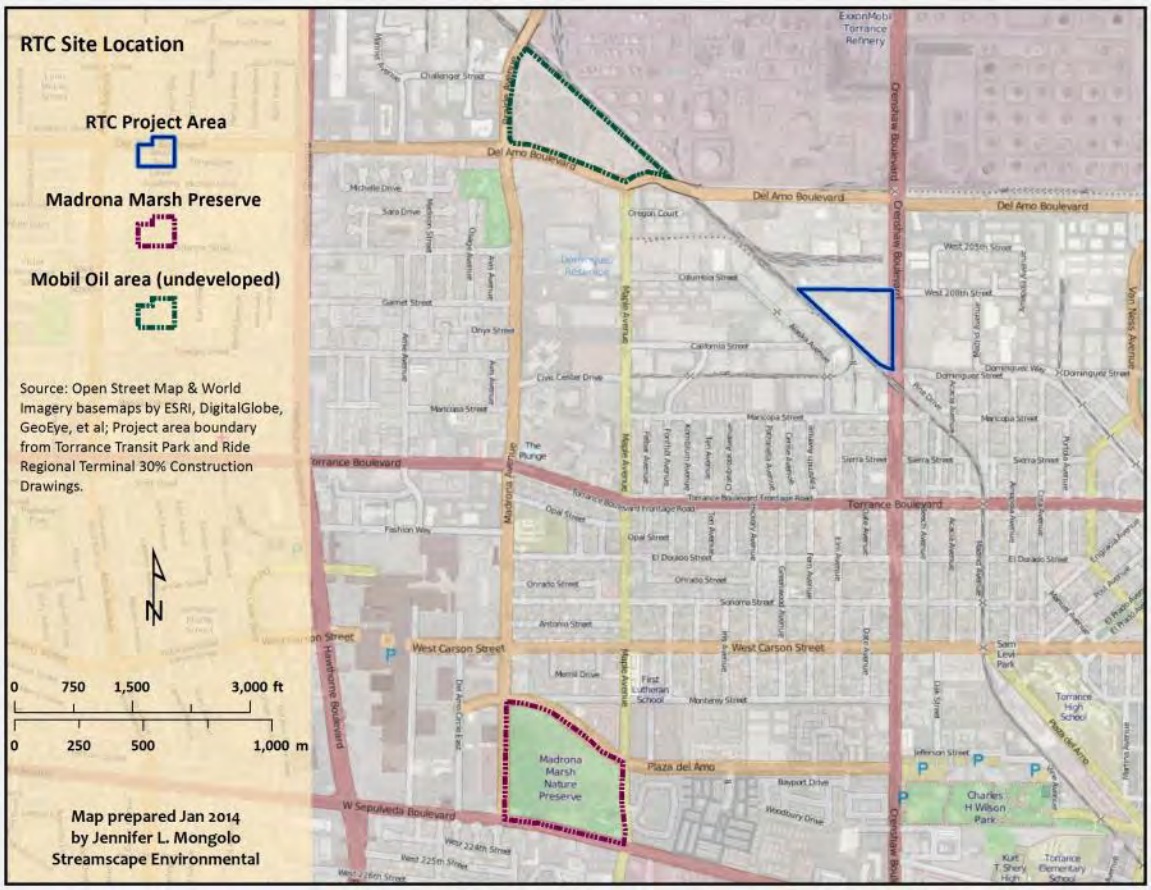

Figure 1. Location of the RTC site with respect to other undeveloped land in the area.

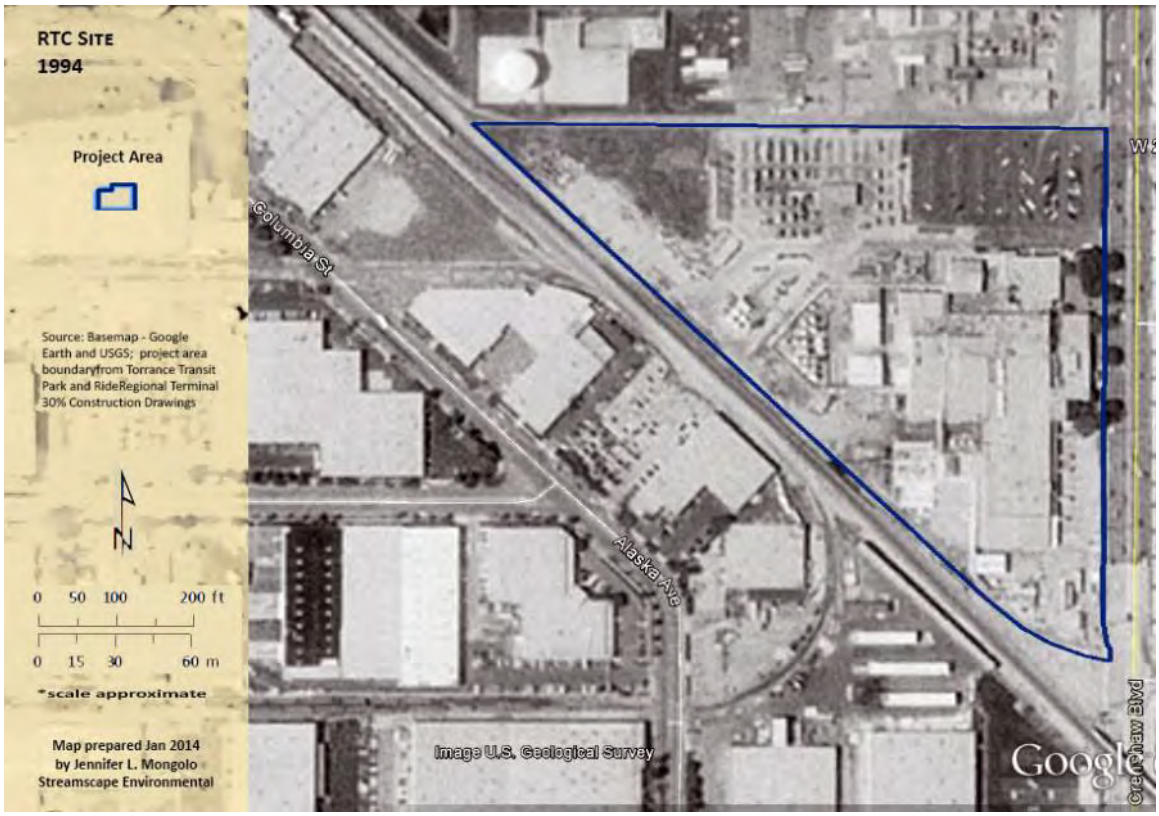

Figure 2. Aerial photograph from 1994 showing majority of the RTC site (blue triangle) covered by an industrial facility.

Soils and Topography

The site is essentially flat but is slightly higher (75-80' elevation) at the southeastern corner (nearest Crenshaw Blvd.), dropping to 70-75' elevation across most of the northern half of the property, and to just under 65' elevation in two small sumps in the north-central and south-central portions (Figure 3a). The slope throughout the site averages less than 5%; that of the seasonal pool area (i.e., the northern portion of the site, exclusive of the proposed transit center) is 3.1%, meaning that the seasonal pool has a slope of roughly 32:1. The soil over most of the site is largely disturbed, mixed with gravel, cement, and other indications of prior human usage, except for the far western corner (which was apparently not covered by the structures on the site) that appear slightly finer and appear to be better-drained. Based on a recent geotechnical study involving 13 borings and 9 cone penetration tests (Diaz Yourman & Assoc. 2013), the soils at the site vary from silty sand with varying amounts of gravel within approximately five feet of the surface over most of the site, with clay (or sandy lean clay/clayey sand) just below that, with the clays starting around 65'-70' elevation down to around 10' below surface, alternating clay and sand down to at least 60' (refer to boring logs in Table 1, *ibid*). This would explain the development and persistence of a seasonal pool at the site, as water would drain through sand (and gravel) to around the 65' level, before become becoming blocked by the harder clay layer.

According to Diaz and Yourman (*Ibid*), groundwater was not detected during soil geotechnical investigation, but was found to begin at approximately 85' below the surface in a prior study (Earth Tech AECOM 2009). Thus, the willows (*Salix* sp.) and mulefat *Baccharis salicifolia* at the site are apparently maintained solely by precipitation and subsequent pooling near the surface.

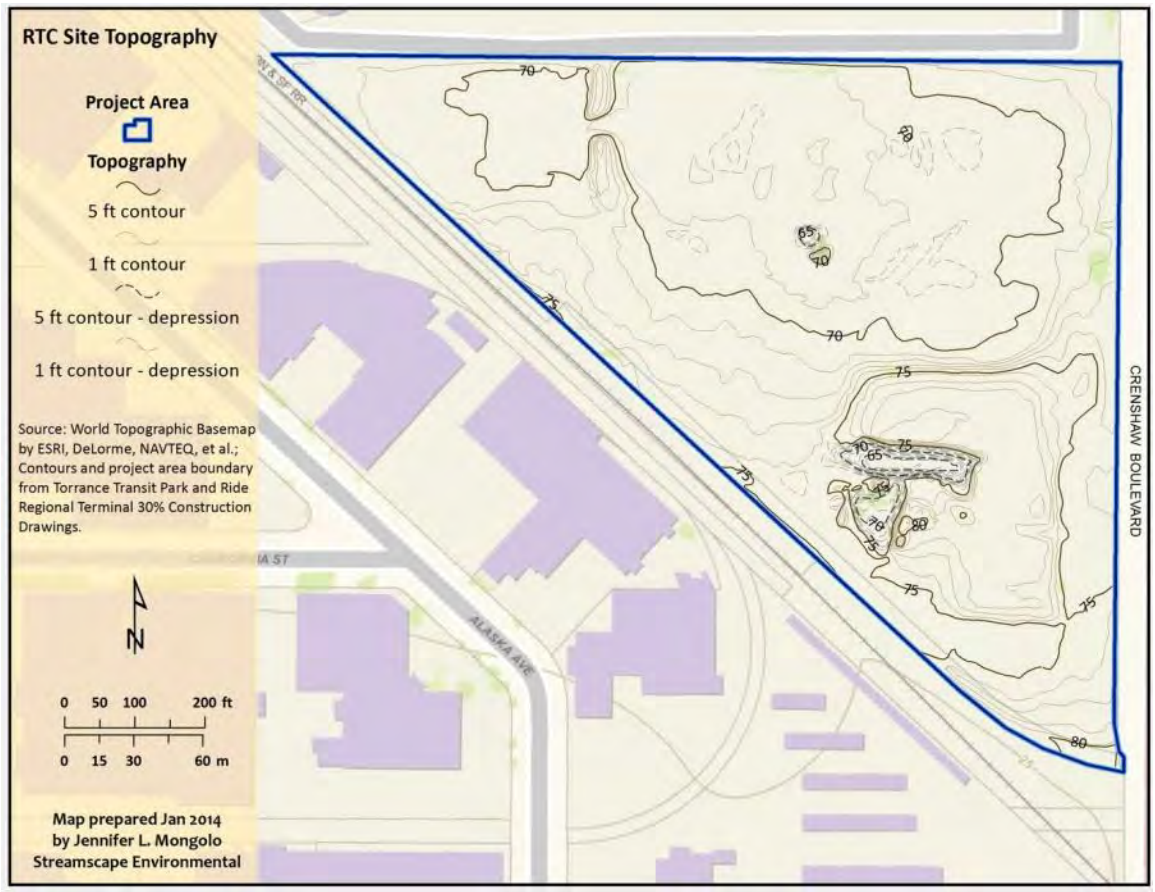

Figure 3a. Modern topography of RTC site.

The early history of the site – and therefore, the original flora and local topography – is imperfectly known for any period prior to the early 1950s, when aerial photographs reveal that the entire eastern and southern portion of the site was developed with what appears to be industrial buildings as early as 1952 (available at www.historicaerials.com), a situation confirmed by USGS Topographical maps from the same era; prior to this, aerial imagery from 1924 appears to show the area around the RTC site under intense agricultural cultivation (http://www.flickr.com/photos/metrolibraryarchive/8006389546/). However, an early topographical map dated 1951 indicates a distinct depression over much of the site (Figure 3b); because no marsh or woodland vegetation was noted on this map, it is possible that this was a vernal pool, or at least a seasonally-wet depression, which would not be expected to sustain riparian vegetation, and which would be dry much of the year. This is

consistent both with the current vegetation at the site (albeit presumably present in a much reduced state in terms of native species and diversity), as well as what is known about the region historically (e.g., Mattoni and Longcore 1997). Research into historical notes, photographs and specimen records suggests that most of Torrance was within the "Los Angeles Coastal Prairie", a band of flat to gently rolling grassland – dotted with seasonal pools of varying sizes and configurations – once located between the El Segundo Dune complex along the immediate coast and large alkali wetlands (e.g., Gardena Slough, Bixby Slough) and riparian areas (e.g., Wilmington Drain, Los Angeles River) to the southeast (see e.g., Mattoni and Longcore 1997). So, while this depression was apparently obscured/built-over by industrial development by the early 1950s, it may help explain the presence of two vernal pool-associated species, southern tarplant and mosquito-fern (*Marsillea vestita*) at the site decades later.

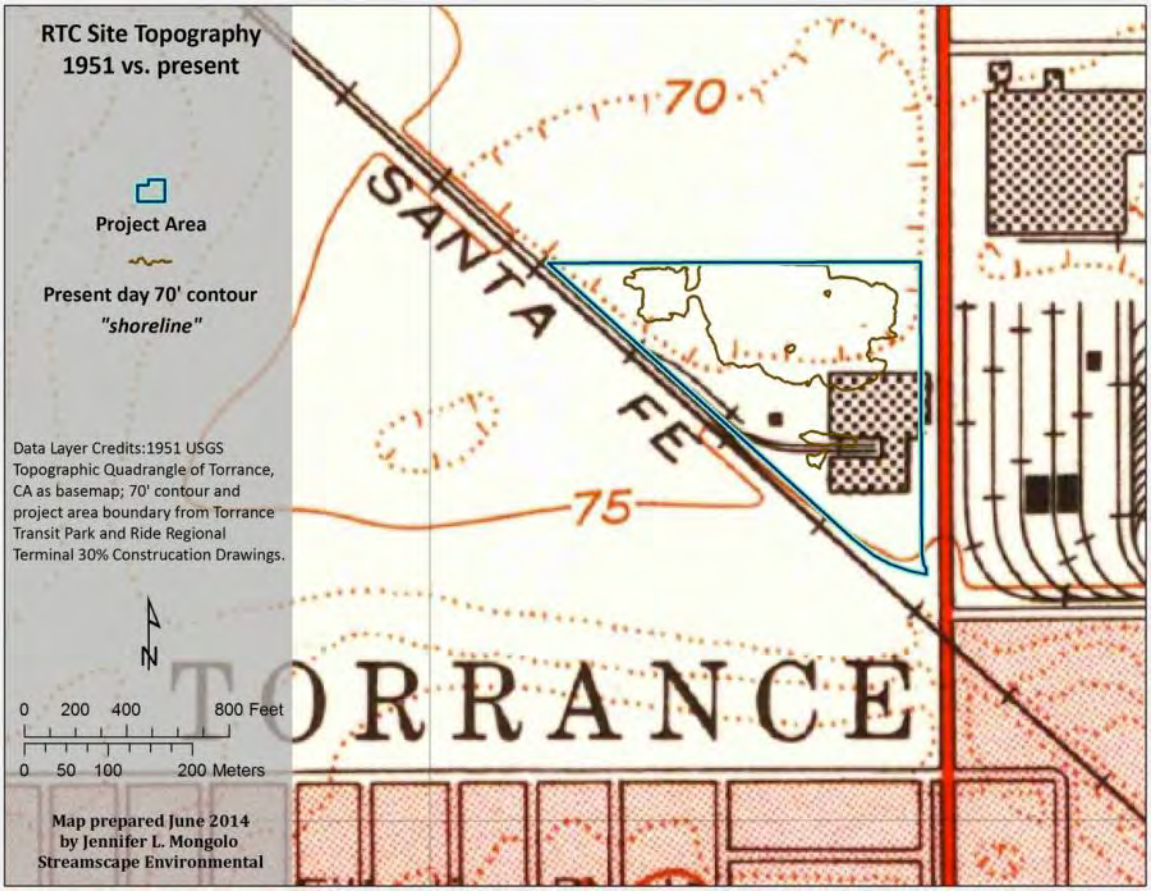

Figure 3b. Historical topography of the RTC site.

Overview of the Biological Communities

Vegetation

The current vegetation at the RTC site is wholly novel, having developed since the removal of industrial buildings and partial excavation of the top layer of soil. Therefore, it is difficult to identify any "natural communities" (*sensu* Holland 1986) of the site. Instead, one may use clues from the existing topography, soil, and remnant flora to determine what the historical vegetation, in addition to trying to classify several pockets of existing native-dominated patches of vegetation. Vegetation classification in California is currently in a state of flux, as older, habitat-based classification schemes ("Holland", after Holland 1986) used through the early 2000s give way to a newer, dominant-species-based system ("MCV", Sawyer et al. 2009); however, for highly-disturbed and very small sites such as the RTC site, neither system is particularly useful, since most of the dominant plants present are non-native, and the more interesting natives that would help define the ecosystem occur only as relictual stands, or "micro-communities" of vegetation. This vegetation is mapped in Figure 4, and a plant species list is provided in Table A2.

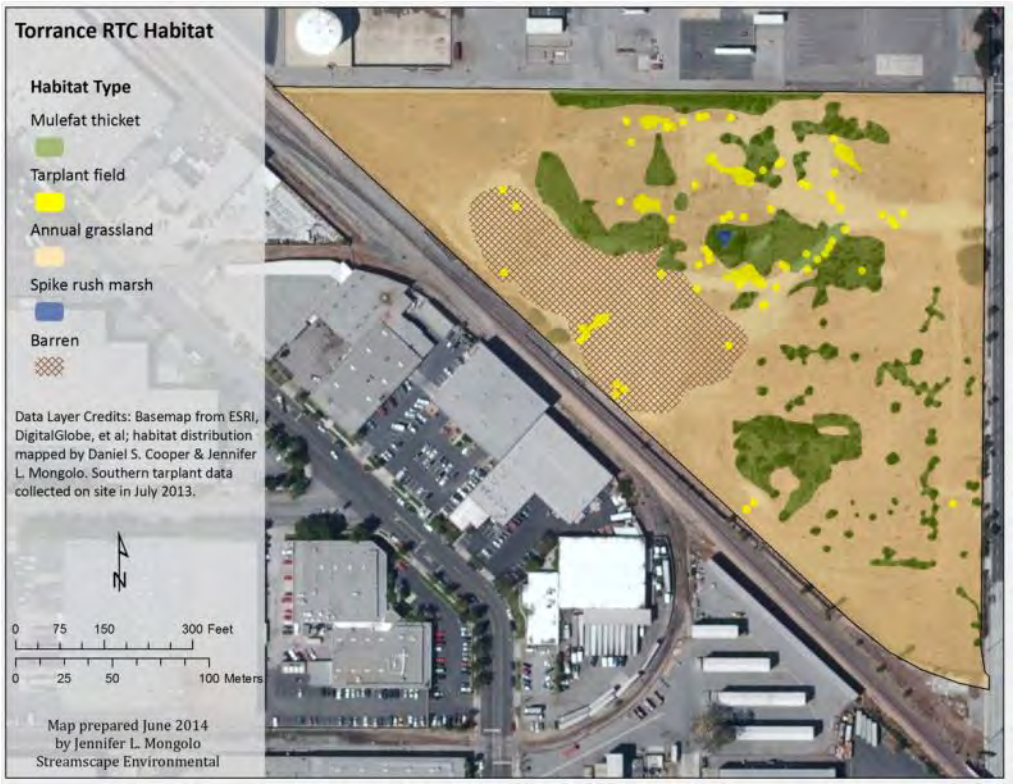

Figure 4. Vegetation communities of the RTC site (as mapped in 2013-14).

Mulefat thicket

Figure 5. View north across eastern half of site showing mix of annual grassland, coyote brush and mulefat, May 2014.

Stands of mulefat mixed with coyote brush (*Baccharis pilularis*) dominate large areas of the RTC site (Figure 5). Both mulefat and coyote brush are evergreen, wind-dispersed shrubs. Coyote brush tends to invade grassland habitat with decreased grazing and fire, and in our region, is associated with soil disturbance; mulefat frequently occurs in seasonally-flooded areas, but is by no means depending on flooding (see citations within Sawyer et al. 2009:421-426). Southern California stands of both typically occur with abundant non-native grasses, and the stands at the RTC site may be classified as the "*Baccharis pilularis*/annual grass-herb" Association, reflecting the nearly solid understory of annual, entirely non-native grasses. Dominant grass species at the site include wild oat (*Avena fatua*), ripgut brome (*Bromus diandrus*), red brome (*B. madritensis* ssp. *rubens*), foxtail barley (*Hordium murinum*), Italian ryegrass (*Lolium multiflorum*), and rattail grass (*Vulpia myuros*).

The small sump near the center of the property supports most of the willows on the property, several mid-sized black willows (*Salix gooddingii*), and the "excavation pit" toward the southeastern corner has several arroyo willows (*S. lasiandra*) growing around its edge. Neither stand appears extensive enough to support characteristic riparian bird and wildlife species, as distinct from the scrub elsewhere on the site or even the trees in the surrounding residential areas. So, while, at least the black willows surrounding the sump appear form a contiguous stand, and both species are locally native and naturally-occurring, because of the lack of any other associated species, we consider them as part of the more widespread mulefat scrub (or coyote brush scrub) vegetation type.

Figure 6. Patch of fiddlenecks (*Amsinckia intermedia*), April 2014.

Annual brome grasslands/ "Coastal Prairie relicts"

Scattered amid expanses of non-native annual grasses (largely ripgut brome *Bromus diandrus* and wild oat *Avena fatua* but dominant species each year probably depends on rainfall, etc.) are patches of perennial and annual herbs, none of which are extensive enough to form "stands" of vegetation, but all of which are indicative of the historical flora present on and around the RTC site. These occur in two main areas, the far northwestern corner of the site, and along a former roadbed about midway down the eastern edge. Several native species typical of Los Angeles Basin sandy soils occur here, including telegraph weed, California croton (*Croton californicus*), miniature lupine (*Lupinus bicolor*), truncate lupine (*L. truncatus*), fiddleneck (*Amsinckia intermedia*), and Spanish clover (*Acmispon americana*) (Figure 6). Other natives associated with alkali margin habitat (see above) occur sparingly here, including alkali heliotrope and rattlesnake weed, presumably on the lower, more frequently inundated portions. All of these species are locally common in similar habitat (sandy patches of relatively undisturbed, somewhat alkaine soil) at nearby Madrona Marsh Preserve (Cooper and Fiesler 2012), and were presumably among the common members of the essentially extinct "Los Angeles Coastal Prairie" ecosystem (Mattoni and Longcore 1997).

Tar plant field

Several species of vernal wetland-associated tarplant (*Centromadia*) occur statewide; in coastal southern California, *C. parryi* ssp. *australis* is dominant. All are typical of "vernally wet habitats, including edges of alkaline vernal pools, bottoms of shallow pools, and alkaline flats subjected to periodic or intermittent water inundation." Soil types vary by site, but all are of "fine-textured alluvium, sometimes underlain by claypan or another impervious layer" (Sawyer et al. 2009:850). As discussed in the tarplant mitigation plan for this site (Cooper, in prep.), a clay layer located just below the surface of the RTC site, combined with the fine, somewhat sandy soil site wide, is largely responsible for the conditions conducive to supporting this vegetation type, which occurs widely in and on the margins of broad, very shallow depressions, mainly in the northern half of the site. Cooper (in prep.) also discusses the rich arthropod community associated with southern tarplant, documented both here and

at the nearby Madrona Marsh Preserve. Few if any of the native pollinators attracted to the tarplant flowers may be found in the surrounding urban/residential habitats, which do not support native vegetation. For this reason, this vegetation type should regarded as distinct both from the weedy/brushy areas elsewhere on the site, as well as from the surrounding developed landscape.

Figure 7. Southern tarplant (*Centromadia parryi* ssp. *australis*) growing in road, July 2013.

The associated plant species of the tar plant field habitat at the site are difficult to characterize, since most are annual and have already died when the tarplant is blooming in late summer. Early in the season (e.g., March-May), these include the same non-native annual grasses found in the understory of the mulefat thicket elsewhere on the site, as well as a thick layer of (non-native) crane's-bill (*Erodium cicutarium, E. botrys*). Two native species typical of alkali margins of drying pools, alkali heliotrope (*Heliotropium curassavicum*), and rattlesnake weed (*Chamaesyce albomarginata*) are present scattered through the tarplant areas, as are telegraph weed (*Heterotheca grandiflora*) and everlasting (*Pseudognaphalium* sp.), also native, which occur on slightly higher (and therefore, less frequently inundated) patches of soil. Many non-native shrubs and both annual and perennial herbs grow in the vicinity of the tarplant patches on the site, the most common being white sweet-clover (*Melilotus alba*), Australian saltbush (*Atriplex semibaccata*), Russian thistle (*Salsola tragus*), prickly-lettuce (*Lactuca serriola*) and smilo grass *(Stipa miliacea*).

Figure 8. Filled sump near center of property (not the main seasonal pool), April 2014.

Pale spike rush marsh/Salt marsh bulrush marsh

Two distinct vegetation types, one a marsh community and one a riparian thicket, have formed around a small sump near the center of the property, presumably within the past 15 years. The ring of freshwater (somewhat alkaline) marsh supports a lush growth of two smallish reed species, salt marsh bulrush (*Bolboschoenus*

maritimus) and pale spike rush (*Eleocharis macrostachys*), the latter dominating during the period of maximal flooding in early 2014 (Figure 8). The sump fills with rainwater even after fairly minor storm events (e.g., after <1/2" of rain in March 2014) which persists on the fine mud silts on the floor of the pool, shaded both by the steep slopes of the sump as well as by overhanging trees (willows; see below). While small, this habitat supports a highly distinct community of aquatic plants and wildlife absent from the rest of the site and from the surrounding developed area, notably Pacific tree frog (*Pseudocris regilla*).

"Ephemeral communities"

Because the newer classification of vegetation relies heavily on the dominant species present, rather than geology/soil and hydrology, one of the dominant features of the site, a large seasonal pool that forms during wetter years and supports the southern tarplant population is not treated as a vegetation type. And, as both 2012-2013 and 2013-2014 were such dry winters, the pool did not form since the start of focused visits by Cooper Ecological Monitoring, Inc. in spring 2013 (Figures 9a and 9b). Therefore, at this time, we must reconstruct the actual vegetation of the seasonal pool using the limited field notes (with no photographs) provided to us (T. Drake, unpubl. notes).

Figure 9a. View east toward (dry) seasonal pool (upper left). Plants in the foreground include alkali heliotrope and rattlesnake weed, July 2013.

From these notes, nearly all the species found in 2011 were still present, at least in a dormant/dead state, by spring 2013. One exception is mosquito-fern , noted as being observed on both January 26, 2011 and February 9, 2011 by T. Drake. This species is noteworthy since it is largely restricted to vernal pools and vernal pool-like habitat in California, and is now very rare in the Los Angeles area, found only at the few remaining vernal pools here (including at nearby Madrona Marsh Preserve). Drake also noted the pale spike rush *Eleocharis macrostachys*, another species typical of vernal pools and seasonally-wet depresssions, but also occurring at the margins of permanent freshwater ponds and slow-moving streams. Cross-referencing with MCV, the only local named vegetation type known to have mosquito-fern dominant is pale spike rush marsh, which have been described from both vernal pools and "seasonally moist depressions" in the southern California region (see citations within Sawyer et al. 2009). However, until enough rain falls to fill the main pool at

the site, it is probably impossible to speculate about its dominant vegetation during the main growing season (late winter/early spring).

Figure 9b. Closer view of seasonal pond floor showing tarplant emerging, Sept. 2013.

Wildlife

As would be expected given small size and isolation from other open space in the region, the RTC site supports only a handful of vertebrate species, essentially the most common and widespread local taxa. After repeated visits, we were able to confirm just one species of reptile (western fence lizard *Sceloporus occidentalis*), one species of amphibian (Pacific tree frog *Pseudocris regilla*; tadpoles in the small sump near the center of the site observed on 7 April 2014), and six mammal species (raccoon *Procyon lotor*, striped skunk *Mephistis mephitica*, Botta's pocket-gopher *Thomomys bottae*, Virginia opossum *Didelphis virginiana*, coyote *Canis latrans*, and an unknown small rodent, probably house mouse *Mus musculus*). Though not all mammals would be expected to be resident at the site, and most are also known from the surrounding residential/commercial areas.

Seven species of dragonflies/damselflies have been documented, as well as five species of butterflies, all of which, like the mammals, are widespread in urban/disturbed areas in the Los Angeles region. The occurrence of each is probably highly dependent on rainfall, the filling of the season pool (for dragonflies/damselflies) and the germination of certain flowering plants through spring and summer. All are known to be wide-ranging and plastic in their habitat requirements, except for the western pygmy-blue (butterfly; *Brephidium exilis*), which is dependent on the presence of plants in the family Chenopodiaceae (though these are often common in vacant lots and other ecologically disturbed areas).

The year-round bird diversity of the site is similarly low; just one species has been documented as nesting at the site – the Bushtit (*Psaltriparus minimus*; actively nest-building on 7 April 2014), which is also very common in urban areas throughout California. Other

resident species that may nest include Mourning Dove (*Zenaida macroura*) and House Finch (*Haemorhous mexicana*).

The remaining species may be classified as either winter visitors, transients (stopping briefly at the site during migration) or "non-breeding visitors", using the site at various times of year (including the normal nesting season) but not nesting on the actual site. Examples of winter visitors include Western Meadowlark (*Sturnella neglecta*), Northern Flicker (*Colaptes cafer*), Say's Phoebe (*Sayornis saya*), and Blue-gray Gnatcatcher (*Polioptila caerulea*) – these are found in larger vacant lots in the area, but are not particularly common in urban areas unless certain specific habitat requirements are met (e.g., very large grassy areas in the case of meadowlark).

Transients include several species of swallows and warblers, and flycatchers such as Western Kingbird (*Tyrannus verticalis*) and Ash-throated Flycatcher (*Myiarchus cinerascens*). Several species of raptors, such as American Kestrel (*Falco sparverius*), are best considered non-breeding visitors, though at least some likely breed in the area and may forage frequently at the RTC site depending on the prey levels present each year.

Several species of waterbirds are known from the site based on visits prior to 2013 (after which, water has failed to pool due to prolonged drought conditions), including Snowy Egret (*Egretta thula*) and Wilson's Snipe (*Gallinago delicata*) in January 2011 (Table A1), and various species of waterfowl in prior winters (pers. obs.). However, due to the lack of standing water in 2013-2014, we have little specific data on waterbird use.

Sensitive Species

Rare Wildlife

One species tracked by the California Natural Diversity Database, the Cooper's Hawk (*Accipiter cooperii*), has been observed at the RTC site, and is likely resident in the area. It is now a common breeding resident throughout urban southern California, and for this reason, is no longer considered a Species of Special Concern (Shuford and Gardali 2008).

Several species of special-status birds would be expected to occasionally use the RTC site during migration and depending on local conditions (including standing water), such as the Yellow-headed Blackbird (*Xanthocephalus xanthocephalus*, a California Species of Special Concern (when breeding), which would not breed on or near the property. These are summarized in Table A3.

Two special-status species could potentially be present based on CNDDB data, the California legless lizard (*Aniella pulchra*) and the Riverside fairy shrimp (*Streptocephalus*

wootton)[1]; however, conditions during 2013-2014 have been unsuitable for surveying for either of these species. It must be noted that both are highly localized within urban Los Angeles County and unlikely to be present. Scattered sightings of legless lizard have been made in the Torrance/South Bay region, indicating they can persist where soil conditions are suitable (i.e., areas with high sand content and no recent major soil disturbance). Based on conversations with local experts (e.g., Jack Goldfarb, Southern California Edison), it has not rained enough to warrant a search for legless lizard anywhere in the Los Angeles area as of mid-2014, since negative findings might simply be due to adverse conditions rather than true absence of the species.

In the case of Riverside fairy-shrimp, the odds of its being found at the site are extremely low, as the species has not been detected at the nearby Madrona Marsh Preserve, which has a much better developed vernal pool community. However, since the species is known from vernal pools to the northwest at Los Angeles International Airport (LAWA 2012), it should still be considered to have the potential to occur, at least under optimum conditions (i.e., sufficient winter rainfall).

For mitigation purposes, the legless-lizard could be assumed to be "present" at the site, and pre-work surveys and relocation efforts (to a preserve area on-site, or to the nearby Madrona Marsh Preserve) could be employed to ensure that any population impacts are minimized.

Rare Plants

One species-status plant species has been detected at the site, the southern tarplant (see Cooper, in prep.). This is the only special-status plant species with the potential to occur here (see Table A4).

Rare Vegetation Communities

The rarity classification of California's vegetation types is also in flux; recently, the research consortium "Natureserve" has developed global and subregional categories of rarity that have been adopted for use in the MCV, as well as by the California Department of Fish and Wildlife, which have begun to replace the list of California natural communities designated as "high priority for inventory" and tracked by the California Natural Diversity Database (see Sawyer et al. 2009). Vegetation types are now ranked from 1 to 5, with 1 being the rarest (at any scale). Of the five types identified on the site, mulefat thicket is ranked "G5 S4", or the least-rare level; tar plant field is listed as "G2? S2?" indicating its poorly-known status bit suggesting its rarity at all landscape scales (global/local); the black willow thicket types (which are too limited at the site to warrant their own community) are ranked "G4 S3",

[1] A second species of fairy shrimp known from southwestern California, the San Diego fairy shrimp (*Branchinecta sandiegonensis*), is not known to be extant in Los Angeles County (see: http://www.cdpr.ca.gov/docs/endspec/estext/fr020397.txt)

indicating moderate rarity at the subregional level (but not globally); and pale spike rush marsh is ranked "G4 S4", indicating that it is relatively widespread and not threatened.

Regardless of the conservation rank, most wetlands in California, including many ephemeral wetlands such as seasonal pools, are protected by various state and federal regulations; a discussion of relevant statutes is beyond the scope of this report.

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Appendix

Table A1. List of birds known from RTC site.

Species	**Latin name**	**Jan-Feb. 2011**	**May 13, 2013**	**July 29, 2013**	**Sept. 10, 2013**	**Dec. 12, 2013**	**Jan. 24, 2014**	**April 7, 2014**
Snowy Egret	*Egretta thula*	x		1 overhead				
Wilson's Snipe	*Gallinago delicata*	x						
Cooper's Hawk	*Accipiter cooperii*							1
Red-tailed Hawk	*Buteo jamaicensis*	x						
Red-shouldered Hawk	*Buteo lineatus*							1
Peregrine Falcon	*Falco anatum*	x						
American Kestrel	*Falco sparverius*			1	1 male	1 female	1	1
Western Gull	*Larus occidentalis*	x						
Rock Pigeon	*Columba livia*	x						3
Mourning Dove	*Zenaida macroura*	x	2	1	4	27	4	2
Eurasian Collared-Dove	*Streptopelia decaocto*		1					1
Allen's Hummingbird	*Selasphorus sasin*	x	1	2				3
Anna's Hummingbird	*Calypte anna*	x	1			1		2
Northern Flicker	*Colaptes aura*					2	8	2
Western Kingbird	*Tyrannus verticalis*							1
Ash-throated Flycatcher	*Myiarchus cinerascens*							1
Black Phoebe	*Sayornis nigricans*	x						
Say's Phoebe	*Sayornis saya*	x				1	1	
Warbling Vireo	*Vireo gilvus*		1					
Cliff Swallow	*Petrochelidon pyrrhonota*		2					2
Northern Rough-winged Swallow	*Stelgidopteryx serripennis*		2					4
Barn Swallow	*Hirundo rustica*							1
Common Raven	*Corvus corax*	x					2	1
American Crow	*Corvus brachyrhynchos*	x						1
Western Scrub-Jay	*Aphelocoma californica*							1
Northern Mockingbird	*Mimus polyglottos*			1		1		2 (pair)
European Starling	*Sturnus vulgaris*	x						2

Species	Latin name	Jan-Feb. 2011	May 13, 2013	July 29, 2013	Sept. 10, 2013	Dec. 12, 2013	Jan. 24, 2014	April 7, 2014
Blue-gray Gnatcatcher	*Polioptila caerulea*					5	1 or 2	
House Wren	*Troglodytes aedon*		1					
Bushtit	*Psaltriparus minimus*	x		15	2	15		4 (nest)
Orange-crowned Warbler	*Oreothlypis celata*							1
Common Yellowthroat	*Geothlypis trichas*					1		
Yellow-rumped Warbler	*Setophaga coronata*	x				5		4
Wilson's Warbler	*Cardellina pusilla*		1					
White-crowned Sparrow	*Zonotrichia leucophrys*						2	8
California Towhee	*Melozone crissalis*	x		1				
Western Meadowlark	*Sturnella neglecta*					17		4
House Finch	*Haemorhous mexicanus*	x	6	3			x	19
Lesser Goldfinch	*Spinus tristis*	x						
House Sparrow	*Passer domesticus*						x	
Scaly-breasted Munia	*Lonchura punctulata*							25

Table A2. List of plants known from RTC site.

Family	Scientific Name	Common Name	Native / Int.	Notes
AMARANTHAC	*Amaranthus albus*	Pigweed amaranth	I	Uncommon weed, north-central area
APIAC	*Foeniculum vulgare*	Fennel	I	Two plants summer 2013
ARAC	*Phoenix* sp.	Date palm	I	Single at southeast corner
ARAC	*Washingtonia robusta*	Palm	I	Mainly edge of site
ASTERAC	*Baccharis pilularis*	Coyote bush	N	Abundant
ASTERAC	*Baccharis salicifolia*	Mulefat	N	Abundant
ASTERAC	*Baccharis* sp.	Broom	N	Single at southeast corner
ASTERAC	*Centaurea solstitialis*	Yellow starthistle	I	Uncommon; mainly southeast
ASTERAC	*Centromadia parryi* ssp. *australis*	Southern tarplant	N	Common, mainly north-central
ASTERAC	*Chrysanthemum coronarium*	Garland chrysanthemum	I	Few in May 2013
ASTERAC	*Conyza* sp.	Horseweed	?	Few scattered around
ASTERAC	*Heterotheca grandiflora*	Telegraph weed	N	Common
ASTERAC	*Lactuca serriola*	Prickly lettuce	I	Common
ASTERAC	*Leontidon taraxicoides*	Hawkbit	I	Scarce
ASTERAC	*Malacothrix saxatilis*	Cliffaster	N	Large patch in southeastern corner
ASTERAC	*Picris echioides*	Bristly ox-tongue	I	Common
ASTERAC	*Pseudognaphalium* sp.	Everlasting species	N	Few dried plants in 2013 (absent 2014)
ASTERAC	*Sonchus* sp.	Sow thistle	I	Reported prior to 2013
BORAGINAC	*Amsinkia menziesii*	Fiddleneck	N	<20 plants south of main entrance (eastern edge)
BORAGINAC	*Cryptantha* sp.	Popcorn-flower	N	Reported prior to 2013
BORAGINAC	*Heliotropium curassavicum*	Alkali heliotrope	N	Scattered, mainly northwestern corner
BRASSICAC	(various spp.)	Mustard	I	Few scattered around
BRASSICAC	*Raphanus* sp.	Wild radish	I	Reported prior to 2013
BRASSICAC	*Capsella bursa-pastoris*	Shepherd's-purse	I	Single plant at edge of former pool
CARYOPHYLLAC	*Spergularia bocconei*	Sand spurry	I	Reported prior to 2013
CHENOPODIAC	*Atriplex semibaccata*	Australian saltbush	I	Common
CHENOPODIAC	*Salsola tragus*	Russian thistle	I	Common
CONVOLVULAC	*Convolvulus arvensis*	Bindweed	I	Small patches mainly southeastern corner
CYPERAC	*Eleocharis macrostachys*	Spikerush	N	Restricted (2013/14) to deep pool in center of site
CYPERAC	*Scirpus maritimus*	Bulrush	N	Restricted (2013/14) to deep pool in center of site
EUPHORBIAC	*Chamaesyce albomarginata*	Rattlesnake weed	N	Common at northern edge of former pool and northwestern corner
EUPHORBIAC	*Chamaesyce maculata*	Spotted spurge	I	Few in central area

Family	*Scientific Name*	Common Name	Native / Int.	Notes
EUPHORBIAC	*Croton californicus*	California croton	N	Few plants in far northwestern corner
FABAC	*Acacia* sp.	Wattle	I	Large shrubs along southern fenceline
FABAC	*Acmispon americanus*	Spanish clover	N	Few plants in far northwestern corner
FABAC	*Lupinus bicolor*	Miniature lupine	N	Reported prior to 2013
FABAC	*Lupinus truncatus*	Truncated lupine	N	Reported prior to 2013
FABAC	*Medicago polymorpha*	Burclover	I	Scattered plants
FABAC	*Medicago sativa*	Alfalfa	I	Single plant in northeastern corner
FABAC	*Melilotus alba*	White sweet-clover	I	Common at wetland/pool margin
GERANIAC	*Erodium cicutarium*	Redstem filaree	I	Common; dormant plants 2013-14
MALVAC	*Malva neglecta*	Cheeseweed	I	Few scattered around
MARSILAC	*Marsilea vestita*	Water-fern	N	Reported prior to 2013
MYRTACEAC	*Eucalyptus* sp.	Eucalyptus	I	1 near wetland area
NYCTAGINAC	*Nicotiana glauca*	Tree-tobacco	I	Several in sump of southeastern corner
ONAGRAC	*Oenothera laciniata*	Cutleaf evening-primrose	I	Several along northwestern fenceline
POAC	*Avena fatua*	Wild oat	I	Sparse patches throughout
POAC	*Bromus diandrus*	Ripgut brome	I	Abundant
POAC	*Bromus madritensis* ssp. *rubens*	Red cheatgrass	I	Scattered patches
POAC	*Cortaderia selloana*	Pampas-grass	I	Patch in northeastern corner; scattered plants elsewhere.
POAC	*Crypsis schoenoides*	Swamp pricklegrass	I	Small patch in northwest
POAC	*Cynodon dactylon*	Bermuda grass	I	Several patches throughout
POAC	*Hordeum* cf. *murinum*	Foxtail barley	I	Reported prior to 2013
POAC	*Lamarkia aurea*	Goldentop grass	I	Small patch along roadbed
POAC	*Lolium multiflorum*	Italian ryegrass	I	Uncommon throughout
POAC	*Pennisetum* sp.	Fountain grass	I	Along fencelines
POAC	*Polypogon monspeliensis*	Rabbitfoot grass	I	Few small patches
POAC	*Stipa miliaceea var. miliaceae*	Smilo grass	I	Common
POAC	*Vulpia myuros*	Rattail grass	I	Common throughout
POLYGONAC	*Polygonum aviculare*	Common knotgrass	I	Scarce
POLYGONAC	*Rumex crispus*	Curley dock	I	Several at pool margin
ROSAC	*Pyracantha/Cotoneaster*	n/a	I	A few along fencelines
SALICAC	*Salix gooddingii*	Black willow	N	Several in sump in center of site
SALICAC	*Salix lasiolepis*	Arroyo willow	N	Several in sumps in center and southeastern corner of site
SCROPHULARIAC	*Antirrhinum orontium*	Syrian snapdragon	I	Few in north-central area
SOLANAC	*Solanum nigrum*	Black nightshade	I	Few in northwestern corner
ULMAC	*Ulmus parvifolia*	Chinese elm	I	Few at entrance off Crenshaw Blvd.

Table A3. Special status wildlife known from the Torrance, CA USGS quadrangle (CNDDB search, May 16, 2014)[2].

Common name	Latin name	Feb	State	State/ other	Comments
Cooper's hawk	*Accipiter cooperii*	None	None	WL	OBSERVED; 1 perched on utility pole along Crenshaw Blvd. near site on 7 April 2014. Resident in area.
Golden eagle	*Aquila chrysaetos*	None	None	FP , WL	Unlikely; no nesting/wintering records within 100 km of site.
Redhead	*Aythya americana*	None	None	SSC	Unlikely; requires deep water, freshwater marshes.
Fulvous whistling-duck	*Dendrocygna bicolor*	None	None	SSC	Unlikely; extirpated from California.
Mountain plover	*Charadrius montanus*	None	None	SSC	Unlikely; no recent wintering records within 50 km of site; requires large (1000+ hectare) areas of arid grassland.
Western yellow-billed cuckoo	*Coccyzus americanus occidentalis*	Proposed Threatened	Endangered	-	Unlikely; extirpated from California.
Belding's savannah sparrow	*Passerculus sandwichensis beldingi*	None	Endangered	-	Unlikely; confined to coastal saltmarsh.
Tricolored blackbird	*Agelaius tricolor*	None	None	SSC	Unlikely; formerly bred (1970s) at Madrona Marsh; winters at single site in Torrance (Wilson Park).
Yellow-headed blackbird	*Xanthocephalus xanthocephalus*	None	None	SSC	Possible as a transient if large seasonal pond present; no modern nesting records within 100 km of site.
Black tern	*Chlidonias niger*	None	None	SSC	Unlikely; Extirpated as a breeder from southern California.
California least tern	*Sternula antillarum browni*	Endangered	Endangered	FP	Unlikely; requires coastal strand/estuarine habitats.
Yellow warbler	*Dendroica petechia brewsteri*	None	None	SSC	Expected as a transient; requires more riparian habitat than is present; no modern nesting records for Torrance area.
Light-footed clapper rail	*Rallus longirostris levipes*	Endangered	Endangered	FP	Unlikely; requires coastal strand/estuarine habitats.
Burrowing owl	*Athene cunicularia*	None	None	SSC	Unlikely; requires large (100+ hectare) expanses of grassland.
Coastal California gnatcatcher	*Polioptila californica californica*	Threatened	None	SSC	Unlikely; requires intact coastal sage scrub.
Vermilion flycatcher	*Pyrocephalus rubinus*	None	None	SSC	Possible in migration; breeds in desert regions of California.
Riverside fairy shrimp	*Streptocephalus woottoni*	Endangered	None	-	Possible; not observed during casual observations by T. Drake in 2011 but protocol-level survey has not been conducted.

[2] List excludes fish.

Common name	**Latin name**	**Feb**	**State**	**State/ other**	**Comments**
Western tidal-flat tiger beetle	*Cicindela gabbii*	None	None	-	Unlikely; requires coastal strand/estuarine habitats.
Sandy beach tiger beetle	*Cicindela hirticollis gravida*	None	None	-	Unlikely; requires coastal strand/estuarine habitats.
Palos Verdes blue butterfly	*Glaucopsyche lygdamus palosverdesensis*	Endangered	None	-	Unlikely; requires coastal prairie habitat with foodplant (*Astragalus*).
Monarch butterfly	*Danaus plexippus*	None	None	-	Likely as a transient; no wintering clusters in area.
Pacific pocket mouse	*Perognathus longimembris pacificus*	Endangered	None	SSC	Unlikely; requires coastal strand/dune habitats.
Pocketed free-tailed bat	*Nyctinomops femorosaccus*	None	None	SSC	Unlikely; few local records and no roosting habitat on site.
Silver-haired bat	*Lasionycteris noctivagans*	None	None	-	Unlikely; few local records and no roosting habitat on site.
Mimic tryonia (=California brackishwater snail)	*Tryonia imitator*	None	None	-	No information
Silvery legless lizard	*Anniella pulchra pulchra*	None	None	SSC	Possible; known from ruderal habitat elsewhere in Torrance, but absent from seemingly suitable habitat (e.g., Madrona Marsh Preserve).
Two-striped garter snake	*Thamnophis hammondii*	None	None	SSC	Unlikely; no foothill riparian habitat required by this species.
Coast horned lizard	*Phrynosoma blainvillii*	None	None	SSC	Unlikely; absent from Los Angeles Basin floor away from El Segundo Dunes.

Table A4. Special status plant species known from Torrance, CA USGS quadrangle. (CNDDB search, May 16, 2014).

Common name	**Latin name**	**Federal status**	**State Status**	**CNPS Rank**	**Notes**
Southern tarplant	*Centromadia parryi* ssp. *australis*	None	None	1B.1	OBSERVED; population on site (see Cooper, in prep.).
Coulter's goldfields	*Lasthenia glabrata* ssp. *coulteri*	None	None	1B.1	Unlikely; restricted to coastal saltmarsh edge habitat.
Lyon's pentachaeta	*Pentachaeta lyonii*	Endangered	Endangered	1B.1	Unlikely; restricted to thin, rocky soils in foothills
San Bernardino aster	*Symphyotrichum defoliatum*	None	None	1B.2	Unlikely; extirpated from Los Angeles area.
Mud nama	*Nama stenocarpum*	None	None	2B.2	Unlikely; extirpated from Los Angeles area.
Brand's star phacelia	*Phacelia stellaris*	None	None	1B.1	Unlikely; extirpated from Los Angeles area.
Aphanisma	*Aphanisma blitoides*	None	None	1B.2	Unlikely; restricted locally to Palos Verdes bluffs.
South coast saltscale	*Atriplex pacifica*	None	None	1B.2	Unlikely; restricted locally to Palos Verdes bluffs.
Parish's brittlescale	*Atriplex parishii*	None	None	1B.1	Unlikely; extirpated from Los Angeles area.
Davidson's saltscale	*Atriplex serenana* var. *davidsonii*	None	None	1B.2	Unlikely; not found during repeated visits.
Estuary seablite	*Suaeda esteroa*	None	None	1B.2	Unlikely; restricted to coastal saltmarsh edge habitat.
Peirson's morning-glory	*Calystegia peirsonii*	None	None	4.2	Unlikely; out of range.
Catalina mariposa-lily	*Calochortus catalinae*	None	None	4.2	Unlikely; restricted to heavy clay soils.
salt marsh bird's-beak	*Chloropyron maritimum* ssp. *maritimum*	Endangered	Endangered	1B.2	Unlikely; restricted to coastal saltmarsh habitat.
prostrate vernal pool navarretia	*Navarretia prostrata*	None	None	1B.1	Unlikely; extirpated from Los Angeles area.

Southern Tarplant Mitigation Plan

Torrance Regional Transit Center Site

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Torrance, CA 90503

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FINAL REPORT October 31, 2014

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Table A2. Suggested native species for seeding/planting in Torrance area 45

Introduction

This plan is intended to guide mitigation efforts to offset impacts to a population of the southern tarplant (*Centromadia parryi* ssp. *australis*) at the proposed Torrance Regional Transit Center (hereafter "RTC'), to be located along Crenshaw Blvd. south of W. 208th St. in the City of Torrance. This population, found within a seasonal pool across more than five acres of the now-vacant 15-acre site, is presumably novel, having become widely established here in just the past 10 years. Prior to that time, the majority of the site was an industrial facility, with buildings and parking lots, and only a small area at the far northwestern corner of the site was undeveloped.

Normally, the loss of any wetland in California would require mitigation to ensure a "no net loss" of the resource, typically with a ratio of at least 3:1 of habitat created to habitat lost. However, this is a unique situation, wherein a resource has become established recently, essentially in the time between development phases, and was likely not present in many decades prior. Thus, in consultation with California Department of Fish and Wildlife, this allows for some flexibility in the requirements for mitigation, such that certain habitat creation requirements would not apply.

With this plan, we propose to establish a permanent preserve for the southern tarplant at the RTC site, encompassing the entire northwestern corner that had remained undeveloped through the 1900s, and including what is now a westward extension of the seasonal pool currently at the site. This pool extension would be enhanced by seeding with southern tarplant collected on the site prior to development, and possibly augmented with tarplant and material from other species from nearby Madrona Marsh Preserve (also in Torrance). It could also be expanded slightly with limited, selective grading. The preserve will be managed to protect its resources in perpetuity, drawing on the experience of staff from the nearby Madrona Marsh Preserve, which supports a very large population of southern tarplant that has been managed successfully for decades. Based on our knowledge of the species and the advice of local experts, it is our belief that this will ensure the long-term survival of the species at the site, which may be used in the future by a variety of vernal pool, wetland and open-country species in the region.

Overview of the Southern Tarplant

Biology

The southern tarplant is an annual (rarely perennial) herb that is restricted to the South Coast (and locally, the southern Peninsular Ranges) ecoregion, occurring discontinuously at very low elevations (mainly <200 m) from Goleta, Santa Barbara County south to northwestern Baja California, Mexico (Baldwin 2012). Within this narrow range, it is confined to open, grassy habitats devoid of trees and large shrubs, favoring the margins of

marshes and swamps, vernally mesic grassland, and vernal, or seasonal[1] pools (CNPS 2013). It blooms from May through November (CNPS 2013), with most collections from June through September (Baldwin 2012). It appears to be patchily distributed into four main areas in the U.S. coastal bluffs at Goleta, the Los Angeles Basin from near Torrance and Gardena (formerly to Santa Monica) south to Irvine (Los Angeles and Orange Counties), the lower San Dieguito River valley near Del Mar (San Diego County) and inland at Escondido east to Ramona (San Diego County) (Baldwin 2012). Smaller, isolated populations are scattered throughout the region, as in Ventura County at Simi Valley (collected by author in 2013), and possibly at Newbury Park (T. Garrison, pers. comm.) and near Faria Beach[2]. The population sizes of most occurrences are imperfectly known; the Santa Barbara County population may not extend beyond a handful of small lots and open spaces within a few square miles Goleta-Isla Vista, while in southern Orange County, it appears to be fairly widespread between Newport Beach and the foothills of the Santa Ana Mountains, at least where its habitat remains (Baldwin 2012). Farther inland, the species is replaced by the similar and much more widespread *Centromadia pungens* ("spikeweed").

Aside from being an annual, which would aid in its mobility, it appears to be an especially "weedy", or early-successional plant as well, occurring preferentially in areas that are seriously and continually disturbed by foot and vehicle traffic, mowing, discing, or even grading and soil excavation (Bowler and Hager 2000, Holmes 2010, Harris and Figueroa 2011). Workers with direct experience restoring and monitoring the species (e.g., Harris and Figueroa 2011) report that rainfall appears to affect vigor and distribution of tarplant around a given site, but that naturally-occurring individuals readily germinate in years of reduced rainfall and even drought (K. Kolpin, Bolsa Chica Land Trust, pers. comm.; T. Drake, Madrona Marsh Preserve, pers. comm.), and that hydro-period (the duration of pooled water) can actually have a negative influence on germination if too long (B. Nerhus, via email). Pollinators, including native bees and bee-flies, appear to be especially critical for its persistence (F. Roberts, unpubl. data). Thus, it is known to be a particularly "fickle" species sometimes responding poorly to restoration attempts.

Despite heavy urbanization throughout its range, it can persist in highly developed settings, often on very small sites (<5 acres) entirely surrounded by industrial or commercial development, even within the "inner city", and thus can be among the few native species to occur in an otherwise weedy vacant lot. Not surprisingly it is often absent from seemingly "pristine" sites within its range, and is frequently excluded from its (former) habitat by well-meaning landscaping and restoration efforts that choose to plant trees or create permanent wetlands. Not only can it tolerate disturbance, it frequently *requires* some soil disruption at a

[1] We opt to use the term "seasonal pool" in this plan when referring to the pool at the RTC site, until it can be determined whether it fits widely accepted definitions of a vernal pool. Clearly, it is a pool that fills with water seasonally; while preliminary surveys (by Tracy Drake et al. in 2011) suggest that certain species of local vernal pools may be present, we prefer to await the findings of a more formal wetland delineation, plant survey, etc.
[2] Data provided by participants of the Consortium of California Herbaria (ucjeps.berkeley.edu/consortium/).

site to appear, such as grading and removal of topsoil (one expert at UCSB quipped that it appears "every time we move a building").

Microhabitat is probably especially important in determining where within its range the species appears and thrives; some combination of hard-packed earth, shallow depressions (ideally <6" deep, such as wheel ruts), and low competition from shrubs and thatch-forming grasses all appear to be key, with human activity (e.g., farming, vegetation removal, earth-moving) frequently associated with known occurrences. Depressions are essential to form temporary (but predictable) rain pools that then dry through the spring, resulting in either a ring (where the pool is deep) or a "bed" of southern tarplant appearing in early summer. However, complete drying appears to be key to its survival and persistence; it cannot survive where water pools into late spring, and tends to be absent where surrounding vegetation stays green and lush during this time.

Southern California's vernal pools, now extremely rare, are ideal for this species, as they dry completely in spring and remain so until filled with rain water in late fall/winter; deeper depressions that support emergent and riparian vegetation such as reeds and willows, as well as irrigated areas are incompatible with southern tarplant occurrence, since they don't allow for the necessary months-long drying period (typically April through October). Significantly, by the time the first rosettes of southern tarplant leaves emerge, often in late April, the surrounding vegetation, lush and green through winter, will look bone-dry or dead; when mature plants are in peak flower a couple months later, they are often among the only species in bloom. Thus, the "classic" approach to California landscaping that attempts to retain moisture and encourage year-round plant growth (e.g., irrigation and mulch, planting shrubs, and seeding annuals) may all but guarantee failure for a population southern tarplant (D. Harris, UCSB, pers. comm.).

Populations of southern tarplant appear to be mobile between years, even within small, confined areas, with patches rarely the same size from year to year, often "exploding" in one corner of a site and then somewhere else the next season, or increasing/decreasing up to an order of magnitude. This habit of "migrating" around a site each year, and the variability in sheer population size (as measured either by number of individuals germinating, or the size and number of larger clumps/patches) from year to year, poses unique challenges to setting management goals and benchmarks for restoration of the species, which is often based on a set number of individual plants or percent cover to measure success. These challenges will be addressed by this plan, which should ensure a viable, long-term population of southern tarplant at the RTC site.

Conservation Status

The southern tarplant is a state-rare plant (CNPS Rank 1B.1, "Rare, threatened, or endangered in California and elsewhere; Seriously endangered in California"), with many populations extirpated or threatened (CNPS 2013). Thus, it is addressed through the

California Environmental Quality Act ("CEQA") process where it occurs in areas facing development. Still, there exits some doubt as to its actual current population status, i.e., whether it is still declining and is currently threatened with extinction. Several significant populations (>1,000 individuals), particularly in southern Los Angeles County, have only been vouchered in the past 10 years, and local botanical surveys, which are often conducted in spring prior to its emergence in summer, could entirely miss its occurrence at a site. Its numbers can fluctuate widely from year to year, and new populations in seemingly "sterile" urban areas continue to be discovered (e.g., Holmes 2010). Still, only an estimated 20% of known sites are public or otherwise protected lands (F. Roberts, 2008, *in litt.*), and as population assessment has ever been produced, agencies treat it as an extremely rare and imperiled species.

Our literature search revealed several restoration attempts for this species, most in the past 10 years, many of which have proven successful, including at UC Santa Barbara (Santa Barbara County); Los Angeles International Airport (Los Angeles County); Madrona Marsh, Torrance (Los Angeles County); Los Cerritos Wetlands (Los Angeles/Orange County), Hellman Ranch, Seal Beach (Orange County); Bolsa Chica mesa, Seal Beach (Orange County); Ascon Landfill site, Huntington Beach (Orange County); and UC Irvine campus (Orange County). Techniques have varied from site to site, and findings have been incorporated into this plan.

Existing Conditions

The RTC site is a triangle-shaped property of 15 acres, located on the west side of Crenshaw Blvd. and south of West 208th Street in the City of Torrance (Figure 1). It is entirely fenced/locked on all sides and receives little human visitation. The nearest undeveloped land is around ½ mile to the northwest, a 31-acre undeveloped lot (owned by Exxon/Mobil Oil Corp.) at the northeastern corner of Del Amo Blvd. and Prairie Ave. Madrona Marsh Preserve (44 acres) lies roughly a mile to the south. At late as 1999, most of the site (except for the far northwestern corner) was occupied by a paint factory ("PPG Industries, Inc." Figure 2), which was removed entirely by 2000. This process required considerable environmental remediation, including soil removal, which took place in subsequent years. For at least the past 10 years, the site has been relatively undisturbed, except for occasional weed abatement (mowing, grazing by goats).

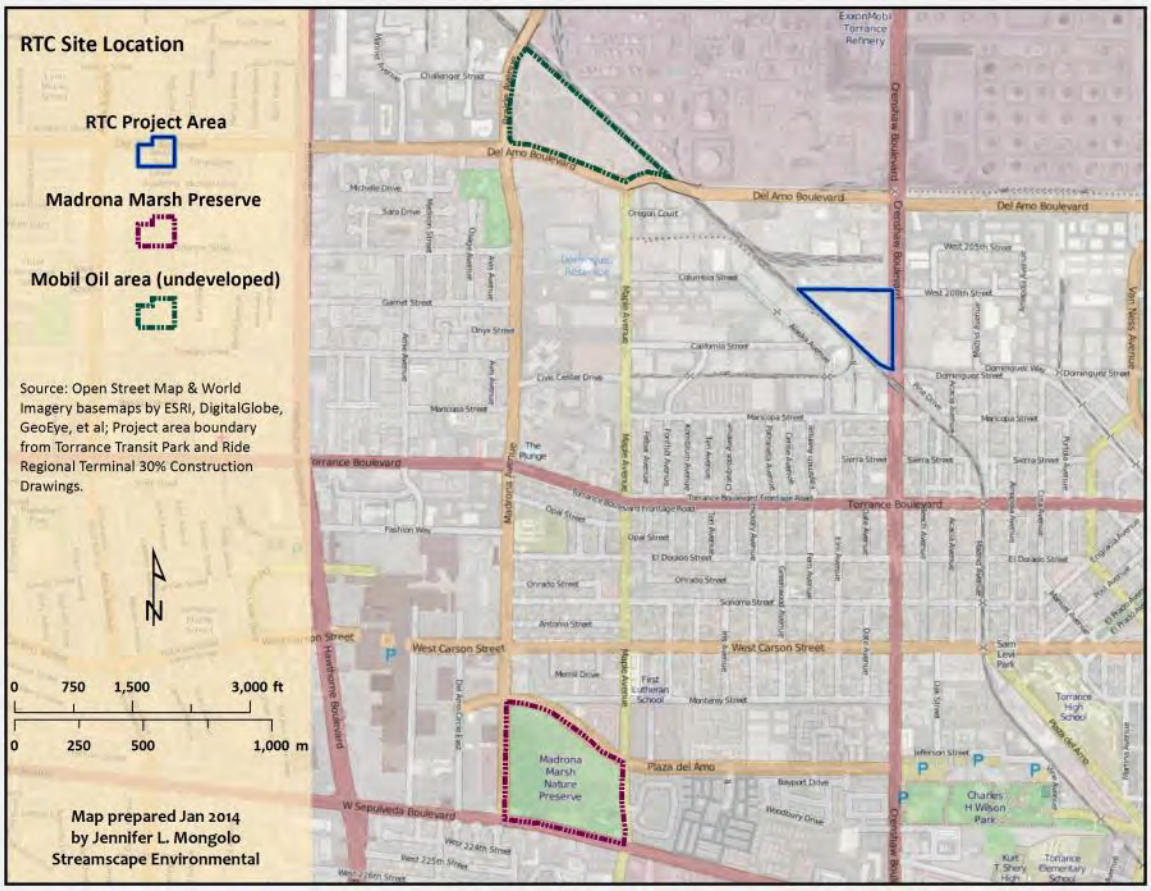

Figure 1. Location of the RTC site with respect to other undeveloped land in the area.

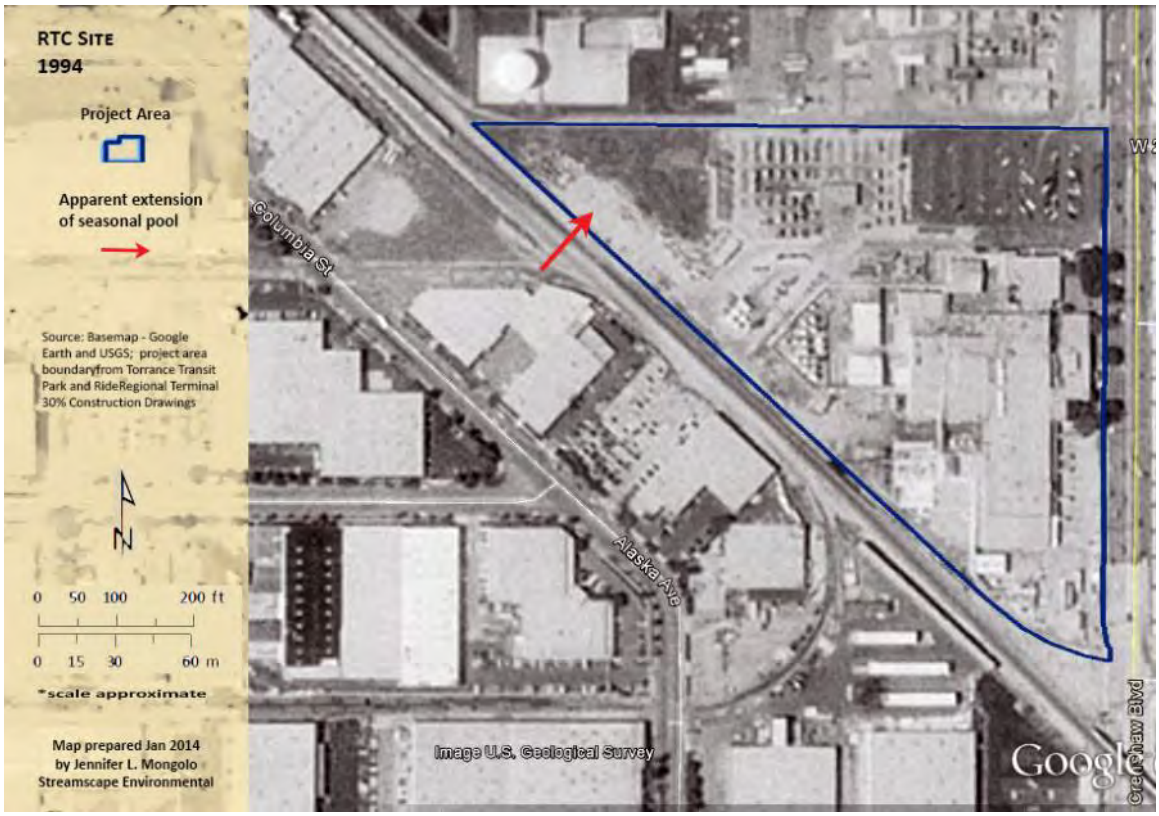

Figure 2. Aerial photograph from 1994 showing majority of the RTC site (blue triangle) covered by a paint factory. Note potential extension of seasonal pool, with whitish soil visible, into northwestern corner of site (red arrow).

Soils, Topography and Vegetation

The site is essentially flat but is slightly higher (75-80' elevation) at the southeastern corner (nearest Crenshaw Blvd.), dropping to 70-75' elevation across most of the northern half of the property, and to just under 65' elevation in two small sumps in the north-central and south-central portions (Figure 3). The slope throughout the site averages less than 5%; that of the seasonal pool area (i.e., the northern portion of the site, exclusive of the proposed transit center) is 3.1%. The soil over most of the site is largely disturbed, mixed with gravel, cement, and other indications of prior human usage, except for the far western corner (which was apparently not covered by the paint factory) that appear slightly finer and appear to be better-drained. Based on a recent geotechnical study involving 13 borings and 9 cone penetration tests (Diaz Yourman & Assoc. 2013), the soils at the site vary from silty sand with varying amounts of gravel within approximately five feet of the surface over most of the site, with clay (or sandy lean clay/clayey sand) just below that, with the clays starting around 65'-70' elevation down to around 10' below surface, alternating clay and sand down to at least 60' (refer to boring logs in Table 1, *ibid*). This would explain the development and persistence of a seasonal pool at the site, as water would drain through sand (and gravel) to around the 65' level, before become becoming blocked by the harder clay layer.

According to Diaz and Yourman (*Ibid*), groundwater was not detected during soil geotechnical investigation, but was found to begin at approximately 85' below the surface in a prior study (Earth Tech AECOM 2009). Thus, the wetland and riparian vegetation present at the site (including mulefat *Baccharis salicifolia*) is apparently maintained solely by precipitation and subsequent pooling near the surface.

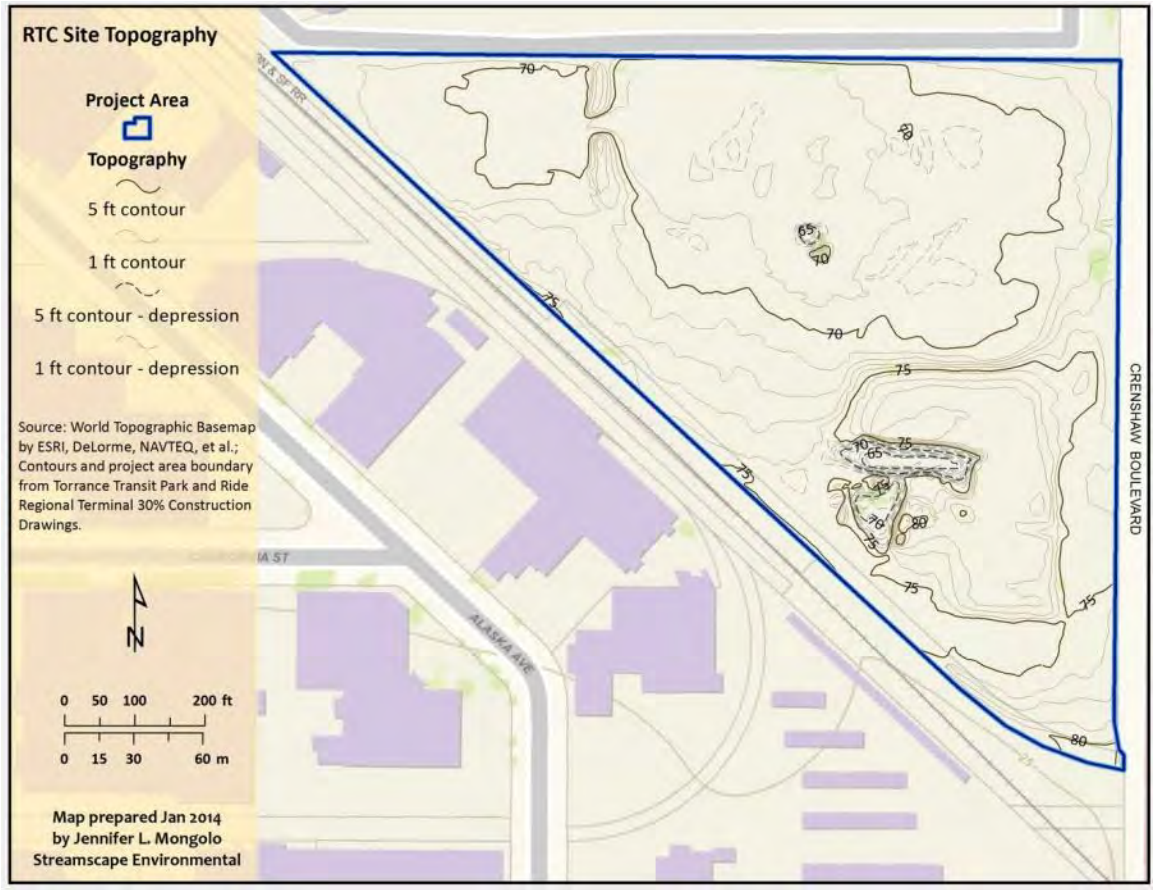

Figure 3. Topography of RTC site.

The early history of the site – and therefore, the original flora and local topography – is imperfectly known for any period prior to the early 1950s, when aerial photographs reveal that the entire eastern and southern portion of the site was developed with what appears to be industrial buildings as early as 1952 (www.historicaerials.com), a situation confirmed by USGS Topographical maps from the same era; prior to this, aerial imagery from 1924 appears to show the area around the RTC site under intense agricultural cultivation (http://www.flickr.com/photos/metrolibraryarchive/8006389546/). Early topographical maps of the area (e.g., 1920s) are not detailed enough to reveal any useful features, but the region was almost certainly originally part of the vast "Los Angeles Coastal Prairie", a band of flat to gently rolling grassland, located between the El Segundo Dune complex along the

immediate coast and large alkali wetlands and riparian areas farther inland (see discussion in Longcore and Mattoni 1997).

The vegetation of most of the site is clearly novel and therefore difficult to classify, but has grown back to what is essentially Los Angeles Coastal Prairie, dominated by low, winter-annual grasses (almost entirely non-native) and limited native annuals, with scattered native shrubs (in this case, coyotebush *Baccharis pilularis* on higher, drier portions of the site and mulefat *Baccharis salicifolia* elsewhere). The deepest sumps (two) on the site support willows (*Salix gooddingii* and *S. lasiolepis*) and in the northern one, a limited amount of emergent vegetation such as rushes (including spikerush *Eleocharis macrostachya* and maritime rush *Scirpus maritimus*). Patches of native forbs occur locally, such as seaside heliotrope (*Heliotropium curassavicum*), Spanish clover (*Lotus purshianus*), telegraph weed (*Heterotheca grandiflora*), and southern tarplant. Scattered non-native trees and shrubs occur (e.g., wattle *Acacia* sp.), mainly on the periphery of the site. Based on multiple site visits by naturalists to the site since 2011 and the author's own observations (to be included in a future report), aside from the southern tarplant, no special-status plant species other than southern tarplant are known on the site. A final field survey for plants is scheduled for completion by the end of spring 2015[3].

Because the site is so flat (averaging just over 3% slope), and owing to the abundance of clay just below the surface, much of the central and northern portion of the site supports a single, large seasonal pool, the watershed of which now comprises the majority of the site (Figure 4). This pool is maintained by hard-packed soil that has been amended with cement, gravel, and other fine debris over the years, thus encouraging rainwater to pool and resulting the development of a vernal pool-like ecosystem across a large proportion of the site since the early 2000s. An aerial photograph from 2005, overlain by elevation contours, reveals what is likely the roughly average extent of the pool in normal rain years, which appears to follow the 70' contour (Figure 5)[4]. Based on our calculations, this "shoreline" of the seasonal pool at the site extends for 3,631.9', and comprises an area of 5.15 acres[5]. Of course, during exceptional rain events, much of the 15-acre site could become submerged, but this water quickly subsides to pool for extended periods of time only up to the 70' contour.

[3] This had been scheduled to be completed spring 2014, but the low rainfall in 2013-14 failed to fill the pool on the site.

[4] This extent of the pool within the 70' contour has been confirmed by our site visits; plant species typically found in seasonally-wet coastal prairie, including within shallow vernal pools, are common at and below this line, and are only rarely observed above it elsewhere on the site.

[5] Calculated from the 70' down to the 68' contour; two small excavated pits extend the elevation down to c. 65', but are very limited in extent.

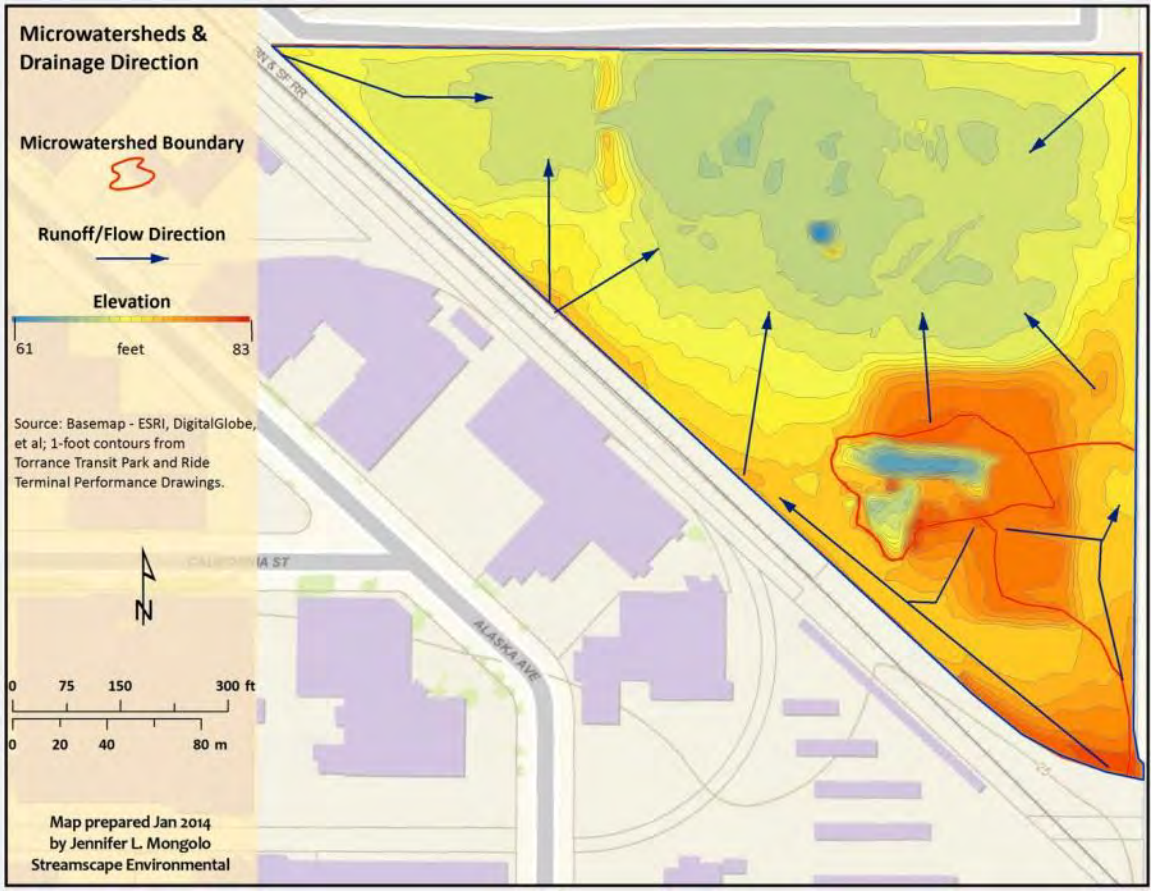

Figure 4. Watershed and drainage patterns of RTC site.

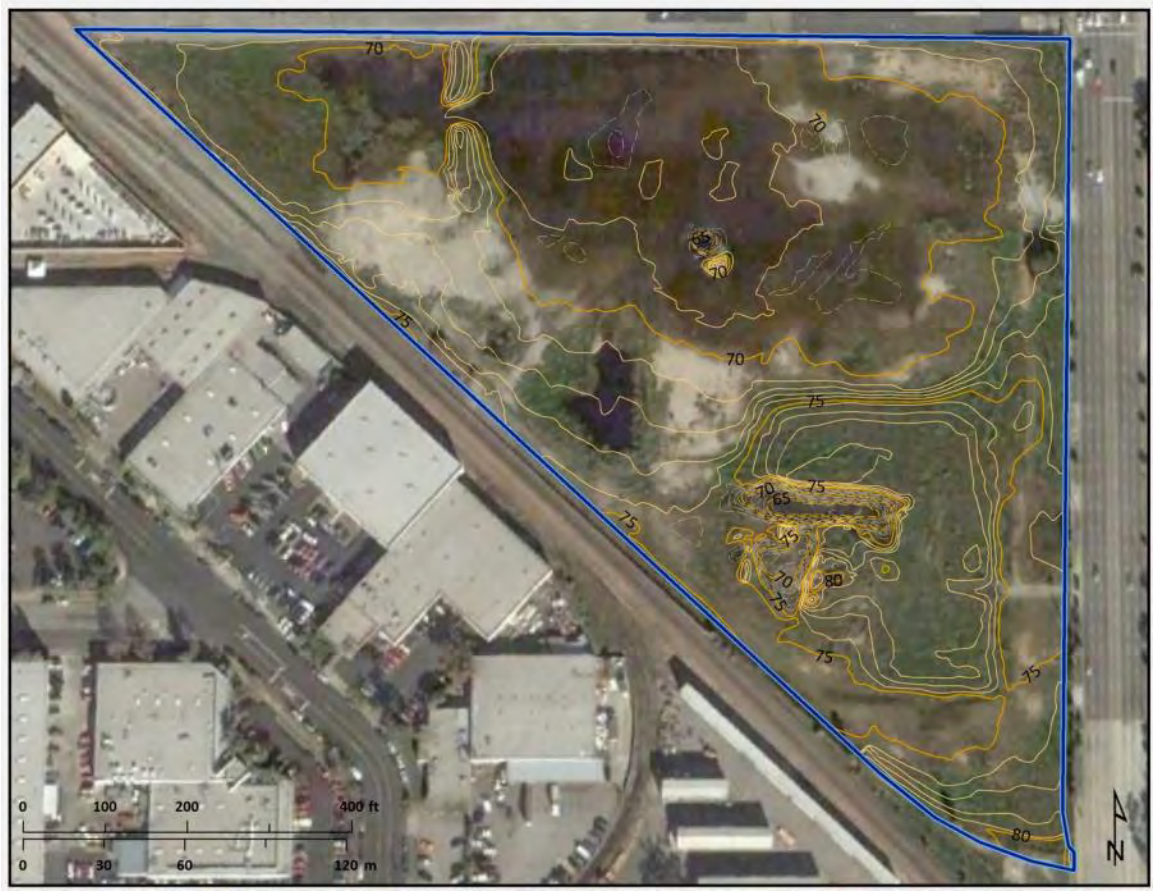

Figure 5. Aerial view of what is likely the "average" extent of seasonal pool at the site, from January 2005.

Figures 6a-6e show typical southern tarplant habitat at the RTC site and at nearby Madrona Marsh Preserve (also in Torrance).

Figure 6a. Example of southern tarplant habitat at RTC site, a flat area of sparse grasses, forbs, and scattered woody vegetation. The shrubs in background are mulefat (*Baccharis salicifolia*), which are presumably "sub-irrigated" by natural groundwater at the site, and whose distribution has little to do with the seasonal pools. The bright green plants are Russian thistle (*Salsola tragus*), a potential competitor of southern tarplant.

Figure 6b. Closer view of southern tarplant seedlings emerging (RTC site), with several already in bloom (May 2013). This level of annual grass cover (brownish stalks/dried out by May) does not form an impenetrable thatch, and thus is apparently compatible with successful southern tarplant germination.

Figure 6c. Another example of southern tarplant occurrence at the site (May 2013). Many individual tarplants were recorded as growing directly on the (gravel) roadbed at the site. Here, several prickly lettuce (*Lactuca serriola*) stalks emerge from a single, large southern tarplant. This plant was host to many native bees and bee flies during several visits in summer 2013. Additional, smaller southern individuals were found scattered along this road, and locally in the grass beyond the road edge.

Figure 6d. Southern tarplant habitat at the northwestern corner of the RTC site, near what would be the eastern edge of the proposed preserve site. The whitish soil, which forms a portion of the floor of the large, rain-filled seasonal pool here, has a high concentration of cement and gravel (from previous industrial development that has since been removed), which may discourage grasses and other species that would presumably compete with the tarplant. The large plant in foreground (at right) is a clump of southern tarplant with stalks of (non-native) prickly lettuce emerging.

Figure 6e. Southern tarplant thriving at nearby Madrona Marsh Preserve. Note similarity in the landscape appearance, including the grass/shrub density, presence of scattered mulefat shrubs, etc.

Tarplant Occurrence

Southern tarplant was first noted at the site during preliminary environmental documentation around 2009 (D. Santana, City of Torrance) for a proposed Metrorail facility at the site. A fairly large population of the plant was observed during visits in fall 2011 (T. Drake, unpubl. data), and we conducted more detailed mapping in summer 2013 (Figure 7). Larger yellow polygons in Figure 7 supported clusters of 20-50 individual plants, resulting in an estimate of c. 300 individuals in late July. Later mapping (on 10 September 2013) found additional occurrences (which had no doubt appeared later as the season progressed, bringing the 2013 estimate to a maximum of 350-400 plants blooming at any one moment).

Based on our calculations, all occurrences of southern tarplant (i.e., 100% of the population present at the site), fell between the 67' and 75' elevation contours (See Appendix, Table A1). We term this zone the "maximum occurrence area", and estimate it occupies roughly 80% of the site. However, of 255 plants in bloom on the July 29, 2013 site visit, 204 (80%) were found within a much narrower elevational band, the 68'-70' contour, which we term the

"optimal occurrence area"; the flat topography of the site results in this latter elevational zone covering roughly 34% of the property (Table A1, Figure 8).

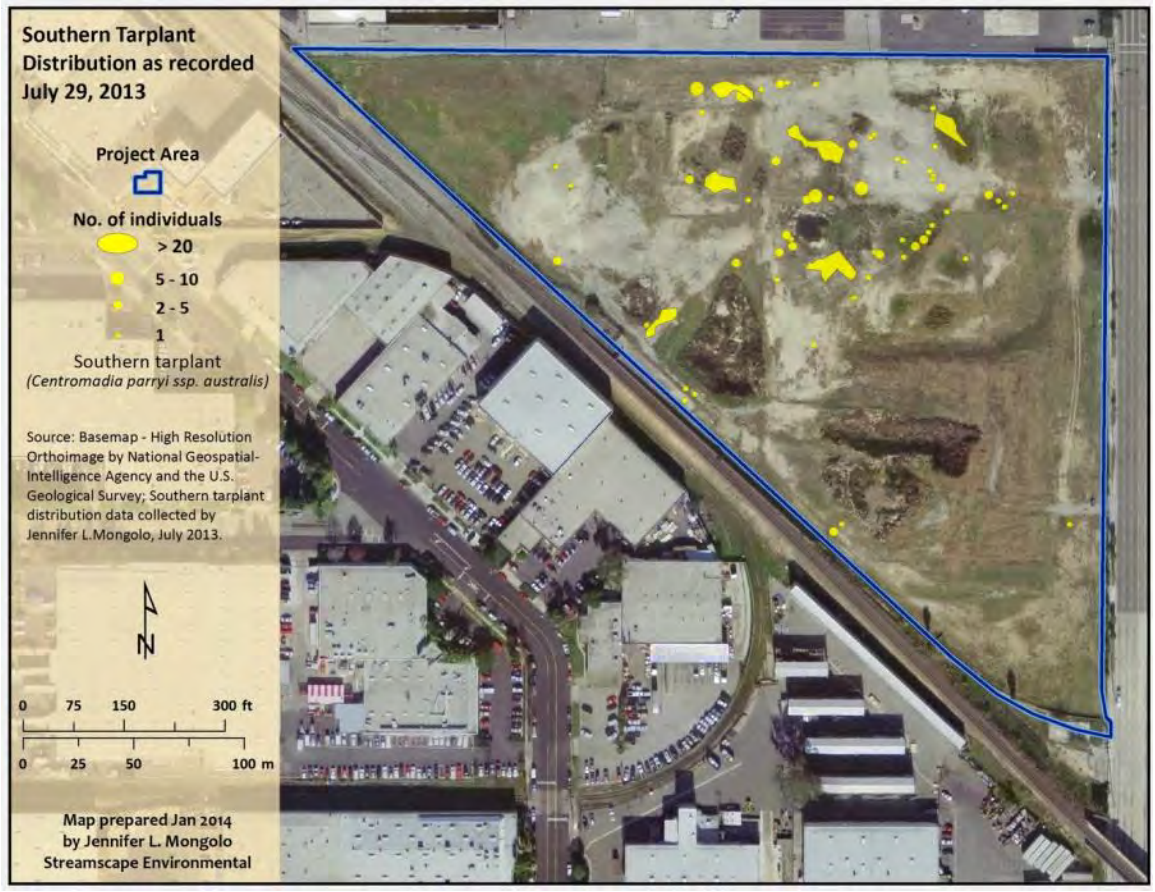

Figure 7. Distribution of southern tarplant distribution at the RTC site on 29 July 2013 (mapping by Cooper Ecological Monitoring, Inc.).

The distribution of southern tarplant by elevation is graphically presented in Figure 8. Note that only a handful of plants were observed in the southern third of the property, the area proposed for the transit center, but do coincide with the location of a proposed parking lot and retail development.

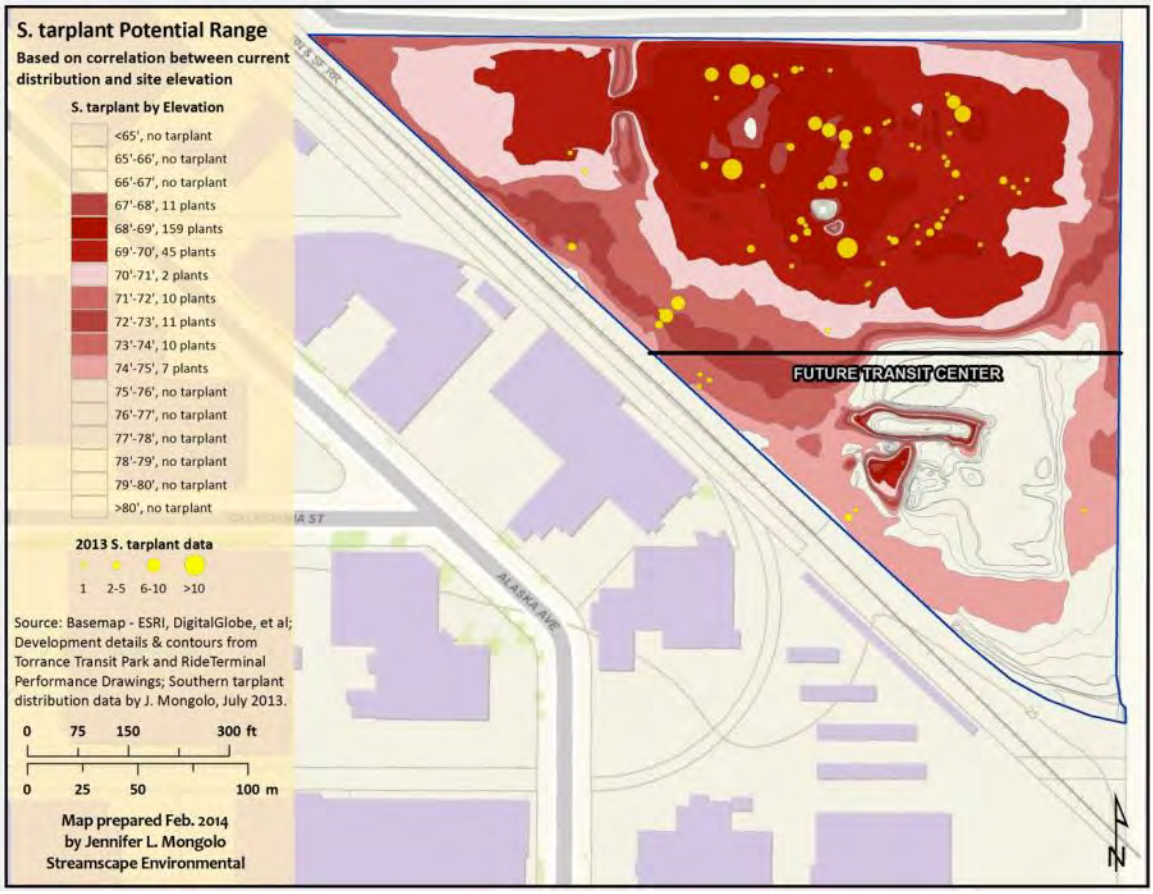

Figure 8. Distribution of southern tarplant, by elevation.

Other Sensitive Species

Based on general biological surveys by Tracy Drake and/or Daniel S. Cooper on 19 January 2011, 26 January 2011, 9 February 2011, 14 May 2013, 29 July 2013, 10 September 2013, and 10 December 2013), other than southern tarplant, there are no known special-status species on the site. Final site surveys will be completed by spring 2015.

Preliminary observations of plants in 2011 (by T. Drake) suggest that a highly limited vernal pool flora is present at the site, which probably reflects both the shallow topography (which limits pooling days each year) as well as the site's long ecological isolation. Of the plant species identified by Fiesler and Cooper (2012) as characterizing vernal pools at the nearby Madrona Marsh Preserve, only the water-fern (*Marsillea vestita*) has been observed at the RTC site at this time. A few native species typical of alkali grassland/coastal prairie that readily occur at the margins of vernal pools are present, such as rattlesnake weed (*Chamaesyce albomarginata*) and seaside heliotrope (*Heliotropium currasavicum*), but these are not necessarily indicator species of pools *per se*. Other species that might have been noted during prior visits (e.g., January-February 2011) but which were not include water-plantain (*Alisma plantago-aquatica*), saltgrass (*Distichlis spicata*), toad rush (*Juncus bufonius*), wooly-heads

(*Psilocarphus brevissimus*), and lowland cudweed (*Gnaphalium palustre*). While we anticipate that surveys in 2015 will confirm that these species are in fact absent at the RTC site, we also propose introducing some of these from material collected at nearby Madrona Marsh – or from the next-nearest available source – as part of our mitigation measures prior to this (see below).

Project Description

Goals

The southern tarplant population at the RTC site currently extends over approximately five acres, and was estimated in 2013 at 350-400 individuals in five large (>20-individual) patches during both a 29 July and a 10 September visit. Scattered individuals and clumps (<10 plants) were found more widely during both visits. Many individuals were observed to have already flowered and even died-back during the 10 September visit, so the total number of plants that germinated throughout the entire season may have been somewhat larger in 2013. And, these visits were made following an extremely dry winter (2012-13) so it is likely that more individuals could have been present following wetter years.

Our restoration plan has three main goals:

- To relocate the southern tarplant population onsite prior to major impacts from proposed development;
- To maintain this future population onsite at a 3:1 ratio[6], with a goal of roughly 900-1,200 individuals maturing in each of two of five years following project implementation;
- To permanently set aside and manage an approximately 2-acre portion of the property.

To accomplish these goals, as mitigation measures (MM), we recommend the following main strategies:

- MM1: The preserve will include at least one seasonal pool, suitable for sustaining a population of southern tarplant;
- MM2: The site preparation and seeding/planting of the preserve with southern tarplant will commence prior to the start of proposed construction, and a five-year management and monitoring period following its creation will allow for experimentation with different approaches to maximize success of southern tarplant germination and survival;

[6] There appears to be no standard mitigation ratio for this species; one plan (Holmes 2010) used a 1:1 ratio for a restoration project in Huntington Beach, while another in Goleta (Harris and Figueroa 2011) used 3:1, and California Department of Fish and Wildlife has recommended City of Torrance use a 3:1 ratio for this project.

- MM3: Additional locally-native vernal pool and grassland species will be introduced to the preserve, as appropriate;
- MM4: The preserve will be managed in perpetuity for the benefit of the southern tarplant and associated vernal pool species;

Justification

The resulting extent of the southern tarplant population at the site following its relocation to the proposed (roughly 2-acre) preserve will be smaller than that which currently exists at the site overall. However, nearly 100% of the proposed preserve elevation is within the "maximum occurrence area", or the area within which all tarplant individuals were mapped across the entire RTC site, and 25% of the preserve's area currently features a seasonal pool is considered to be within the "optimal occurrence area" of the mapped tarplant occurrences. The average slope in the preserve (4.3%) is roughly similar to that of the remainder of the site (3.1%[7]), and the average slope of that portion of the pool within the proposed reserve (2.5%) is very similar to that of the seasonal pool at the entire site (2.0%).

So, while the area of the pool on the proposed preserve will obviously be smaller than that which exists on the site today, several factors unique to this site may offset the impact of this loss of habitat. First, the property was an active industrial site for decades prior to its becoming vacant around 10 years ago; the proposed preserve acreage is similar to that of the undeveloped land on the property that existed for much of the latter half of the 1900s. It is likely that no comparably sized population of southern tarplant was present at the site for decades leading up to the late 1990s/early 2000s. So, while a historical population may have been present in the distant past, these plants present today clearly represent a newly established ecosystem on the property. Therefore, the proposed development is not impacting an obviously sensitive site with, for example, a type of long-lived, "old-growth" vegetation community highly susceptible to disturbance and difficult to restore, but instead is disrupting a very recent feature that developed as a result of mechanical disturbance.

Finally, the seasonal pool at the site does not appear to be functioning as an ecological intact ephemeral wetland (as are the pools at Madrona Marsh Preserve), with characteristic vernal pool species, but rather as a more degraded, largely anthropogenic feature, with a limited array of vernal pool-associated taxa that would likely thrive in an area much small than that which exists today[8]. For this reason, we feel the existing vernal pool-like features of the site

[7] Northern portion of RTC site only; excludes the area within the proposed footprint of the RTC facility itself.

[8] The origin and historical extent of the seasonal pool at the site is nebulous; USGS Topographical maps prior to the 1950s show essentially a featureless plain in the entire vicinity of the site. However, maps produced in the early 1950s (1952, 1954) depict a large, shallow depression north of the (existing) railroad right-of-way at the 70' contour, where a similar feature exists today (aerial photography from this period is inconclusive, apparently taken during the dry season). However, by the mid-1960s, USGS Topo maps of the site lack contour lines, as is typical of industrial/developed portions of these maps.

could be easily conserved and even enhanced, particularly if afforded the protection of the proposed onsite preserve.

As proposed, the preserve at the site would comprise 106,146.3 s.f., or roughly 16% of the current site (we estimate the undeveloped portion of the site in 1994, located in essentially the same area as the proposed preserve, at 99,316.8 s.f., or 15% of the site). The proposed preserve would feature 823.5' of seasonal pool shoreline, or 27% of that which currently exists across the site today[9]. We calculate that essentially the entire preserve, 105,551.0 s.f., or 99%, would be considered part of the maximum occurrence area for the tarplant, based on its mapped distribution around the site. And, while the representation of optimal occurrence area for southern tarplant would be low relative to that elsewhere on the site, about 12% of that present on the entire site (26,489.4 s.f.), additional selective grading could be undertaken which could expand the pool area within the preserve within the optimal 68-70' elevational gradient.

During the initial five-year monitoring period (standard for restoration projects), all individual or large clusters southern tarplant would be mapped (using GPS) on the site twice a year (early season ≈ June and late season ≈ September), and the results mapped and compared with the prior year's mapping.

Seasonal pool characteristics

The most essential component of this restoration plan is the retention and maintenance of a seasonal pool in the proposed preserve. Because of the specific needs of the southern tarplant, the pool must fill reliably with rainwater, must not receive irrigation (unless needed to support the tarplant), and must be mechanically disturbed on a regular basis (probably at least annually). The pool will not resemble a typical pond, with reeds and shady trees, and will likely look like a weedy vacant lot most of the year. However, in mid-winter, it will fill most years, and will likely attract waterfowl and herons, and in early spring, it may support treefrogs and dragonflies. By mid-spring, it will be dry, and the southern tarplant will begin to germinate and will be in bloom by late spring (May), with abundant yellow daisy-like flowers through November.

Topographically and ecologically, the pool within the proposed reserve will remain an extension of an existing pool as it is now. It shall extend west through the preserve area from an existing berm that will run south from the northern side of the property, which will block all drainage west into the preserve (Figures 9a and 9b). It shall receive no runoff from W. 208th Street during winters with normal precipitation (exceptional rain events will result in unpredictable, though likely brief, flooding). Thus, it will be a self-contained feature hydrologically, with no inlet and no outlet, essentially a smaller version of what exists today.

[9] As measured at the 70' contour line.

Figure 9a. View (north) of berm that will form the eastern edge of the proposed preserve (most of land visible will be inside the preserve). The far end of this berm (i.e., that nearest the northern fence) may be removed or reconfigured to accommodate a proposed extension of W. 208th St., which would follow the northern fence and dead-end roughly here. Pale green plants in foreground are rattlesnake weed, typically found at the edges of drying seasonal pools (and often with southern tarplant).

Figure 9b. View (east) across proposed preserve site. Greenish plants emerging in foreground are alkali heliotrope, typically of somewhat alkaline, sandy soil.

RECON (2012) suggests the following guidelines for "seasonal pond creation" in conjunction with a southern tarplant restoration:

> "All grading and excavation activities for the creation of seasonal ponds will occur in Year 2 of the project. Additionally, if natural depressions are exposed during dethatching, they will be enhanced using mechanized equipment or by hand using shovels. The mechanized equipment will be limited to the use of a small bobcat with rubber tires to minimize soil disturbance.[10]"

As outlined above, we propose to run a pilot project to test whether a smaller version of the existing pool – that within the proposed reserve – can sustain water for more than 30 days; until we observe this pool fill with water, it is impossible to say how much mechanized "enhancement" will be necessary. If the pool drains too quickly (i.e., does not hold rainwater for at least 30 days), and fails to support any new southern tarplant germination (from broadcast seed), we recommend several actions:

[10] We do not anticipate requiring that an archaeologist be present; however, we do recommend having a biologist/restoration ecologist familiar with southern tarplant to be present during site preparation.

- Using a Bobcat or similar equipment to tamp down the soil to promote conditions for pooling;
- Deepening the pool and expanding its "shoreline" to the west, to increase the surface area of the ponded water while maintaining a large shallow area for southern tarplant germination;
- Employing a secondary water source (see below).

We also recommend a curb-cut somewhere at the end of W. 208th Street to allow for easy vehicle access into the preserve (e.g., for a Bobcat or small excavator). We also recommend a fence around the entire preserve (adjacent to W. 208th St., and along the proposed eastern berm) to discourage others from driving in or dumping trash into the preserve.

Implementation

Based on existing management and restoration plans (e.g., RECON 2012), and on conversations with land managers involved in southern tarplant restoration around the region, the following techniques have proven successful for tarplant site preparation in terms of seed harvesting, storage, and planting. We refer below to the "preserve", which is proposed for the extreme northwestern corner of the site, which we recommend setting aside for the southern tarplant and other vernal pool-associated species (Figures 8a and 8b).

We also recommend the creation of a "restoration team" for this project, led by Tracy Drake, manager of the Madrona Marsh Preserve (City of Torrance). Ms. Drake has many years of experience managing southern tarplant at Madrona Marsh, which supports one of the largest known populations. The restoration team would be responsible for assisting the city and its contractors in creating the tarplant preserve, and for monitoring and managing the site in future years. Essentially, the Crenshaw southern tarplant preserve could become a "satellite" to Madrona Marsh Preserve, and would be subject to the same attention in terms of weeding and maintenance.

Seed-collection of southern tarplant involves the harvesting and storage (typically in large trash cans) of the entire mature plant once set has set (which can occur any time from late May through November). Plants should be collected when completely dry (i.e., prior to the first rain), as early as May (with weekly visits following, to check on progress of seeding).

Plants should be cut by hand and simply crushed down into trashcans, and covered. We recommend collecting and storing roughly half the seed for broadcasting around the site, and using the remaining half to grow seedlings at the nursery at Madrona Marsh Preserve for direct planting the following year. Dead plants may be stored in trashcans for up to one year; after that (if they cannot be planted at the site), they should be disposed of.

Some successful tarplant restoration plans indicated that seed be processed prior to broadcast (e.g., LAWA 2012), while others have followed plans that suggest simply sowing

harvested seed directly onto the site. Processing techniques include "cleaning" (removing the husks from the dried seed), "roughing" (slightly crushing or scouring seeds, such as with a rake or shovel, prior to broadcast), and soaking the seeds in water for up to four days (LAWA 2012). We cannot say whether these techniques will be necessary, and suggest that different techniques be tried for some of the seed used, but that a preserve stock of c. 40% of the total seed harvest be retained each year.

Re-seeding each of the five years of the project may or may not be necessary, depending on the first year's results. To err on the side of caution, we recommend planning to collect at least some seed from the site each year there are southern tarplants successfully germinating on-site. The amount of plants collected each year (following seeding) may be adjusted based on the judgment of staff, but could be up to 50% of the total population, particularly if the restoration is successful and many hundreds of plants are present.

Southern tarplant seed will be introduced to the preserve pool and surrounding uplands (e.g., the berm) following the first rain of the season, and intermittently throughout the early rainy season (prior to mid-February, *fide* D. Hubbard, UCSB). It may be raked-in to the soil using a bowrake or hoe, a technique that has proven effective elsewhere (e.g., UCSB). In some areas, the soil may be raked and the seed deposited atop the soil, which has also proven effective (T. Parker, pers. comm.). Depending on the amount of rain that season, light watering may accompany the first introduction of seed into the site (to "bind" the seed and soil, per Harris and Figueroa 2011), but no further watering should take place.

In addition, we recommend planting up to 500 seedlings/"plugs" each year at the site at least the first year (i.e., plants grown at the nursery at nearby Madrona Marsh), to supplement the seeding effort. These plugs should be planted during the early rainy season (e.g., November), on a schedule similar to the seeding. Plugs should be planted within and outside the seasonal pool, as well as on the berm (top and side). For the plugs outside the pool, we recommend watering half (e.g., 250) by hand, every three days, but leaving the other half un-watered, since we have found conflicting reports on whether watering is essential or desirable to promote germination. Depending on success that first year, additional years of seedling planting may be attempted.

Flagging (ideally pin flags, widely available at home-improvement stores) should accompany both seed dispersal as well as seedling planting, to indicate where seeds and plants were sown. Except for the outer boundaries of the preserve, interior fencing is probably not necessary given the small size of the area.

Pilot Seasonal Pool Creation

To increase the chances of success of this mitigation plan, we recommend an immediate pilot project to test the seasonal pool at the preserve site, to see whether it can support southern tarplant germination. This pilot project will proceed as follows:

- Mature southern tarplant will be harvested from the site in fall (entire plants collected), and stored (ideally in large plastic trashcans with lids);
- A temporary berm running north-south along the approximate eastern edge of the proposed preserve will be augmented with minimal disturbance to the site, using a limited amount of on-site soil and possibly wooden planks to form a weir;
- We recommend against using an excavator (an older berm currently exists here and will provide the necessary structure);
- If no natural rainfall occurs, this pool may be filled with water using a water truck, flooding to approximately the 70' contour, and its depth will be recorded at least every three days. Once dried, it may be filled again, depending on rainfall;
- During what appears to be maximum water level, the stored southern tarplant seeds will be introduced into the site using a broadcast method at the edge of the pool, and will be lightly raked-in to the soil to promote germination.
- The existing shallow seasonal pool in the proposed preserve site may be expanded through limited grading, depending on field conditions within the proposed preserve, between the 65'-70' contour;
- The pool, if enlarged, would be contoured with a maximum depth of approximately 12", with gently-sloping edges, and with a majority of the pool being less than 6" deep;
- A portion of the pool floor, ideally where few native species are present, could be mechanically disturbed (see below) to promote conditions for southern tarplant.

Soil banking

Prior to the proposed development of the RTC site, we recommend that the top 3" of topsoil throughout the proposed transit center construction footprint at the site be scraped and stored for future use within the preserve (a mitigation measure recommended by City of Seal Beach 1997). This should take place immediately prior to development of the site, both to minimize the duration of wildlife impacts, and to avoid permanent disturbance of any area should the development footprint be reduced or relocated, or should the project become stalled.

The manner of soil removal and the exact location of storage will be determined by the city based on equipment and land availability; for example, it may be feasible to store soil on the RTC site itself during construction. Or if this is not desirable, soil would need to be transported offsite, at an added cost.

Weed eradication and removal

Since southern tarplant can behave as a weed (coming up annually but unpredictably located in disturbed soil) competition from other weeds, particularly shorter grasses, is not necessarily a hindrance to its success (*fide* D. Harris/D. Hubbard, UCSB); in many areas of the RTC site, it is most common in weedy areas, even in areas that do not appear to have been flooded (or only briefly so). Taller, semi-perennial weeds such as pigweed (*Amaranthus* spp.), Russian thistle (*Salsola tragus*), and mustards (Brassicaceae) may pose a problem if they are too dense, but currently (2014), the site supports few of these species, so weeding prior to planting is probably unnecessary. However, this could change, so we recommend relying on the judgment of the restoration team to determine how much, if any, weeding is necessary.

RECON (2012) provided guidelines for site preparation for a southern tarplant restoration project (which has since been successful) at the Bolsa Chica mesa in Seal Beach. The following guidelines have been developed from that plan.

As part of the restoration site preparation, weeds will initially be removed by "mechanical dethatching", where necessary. From RECON (2012): "dethatching is a technique commonly implemented by restoration practitioners that removes the buildup of nonnative grasses and herbs so that exotic species are controlled and openings within the habitat can be re-created. The schedule for the dethatching effort is timed to minimize impacts to any native vegetation. Dethatching will be performed in late summer or early fall after native species have become dormant for the season. A majority of the mechanical work will be completed by a tractor-mounted deck mower[11]. All cut biomass will be raked and hauled offsite to avoid contamination of preserve with invasive weeds."

This effort, if taken, while likely to be temporarily successful, will need immediate follow-up to discourage weeds from invading. RECON (2012) further recommends that following initial weed removal/dethatching, and prior to hand removal weed control efforts, the entire restoration site should be surveyed for southern tarplant occurrences, as the plant can invade (much like a weed) following reduced competition from disturbance. If found, all new southern tarplant occurrences will be flagged prior to hand removal weed control efforts.

Finally we recommend raking and removing all goat droppings from the preserve site prior to any work, including the experimental pool creation described above. The nutrients in the dropping could adversely impact the germination of certain species of plants and animals, including vernal pool species.

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[11] A deck mower is a 3-5 foot wide implement that is attached to the front end of a rubber-tracked, or rubber-tired tractor. The height of the mowing deck can be adjusted from just a few inches to one-foot above the ground surface and will cut/mulch the dead weed biomass as it passes over the restoration area. The mowers do not disturb the soil surface and the material left behind can be easily raked into piles. In areas where native vegetation is present or in tight spaces where the deck mower cannot reach, line trimmers can be used to trim the weedy vegetation while the native species are preserved.

Irrigation and landscaping

No irrigation or landscaping shall be introduced into the preserve, or installed along the edge of West 208th Street, along the railroad right-of-way to the south, or along the proposed eastern berm adjacent to the preserve. However, we recommend installing a spigot or quick-coupler near the preserve during its construction to allow for emergency watering should young tarplant seedings require this at any point in the project. Access to irrigation has proven essential to the success of several local restoration attempts for this plant; several projects have failed due to inadequate water during the establishment of an introduced population (B. Nerhus, via email). So, while over-watering can certainly cause a planting to fail, often as more vigorous weed species overtake tarplant seedlings, under-watering can also ruin a restoration attempt as plants fail to germinate, or if they require additional water during the growing season.

Mulch, even sterile mulch, woodchips, or other foreign objects should not be used in or near the preserve and the seasonal pool, except in the case of gravel employed specifically to encourage growth of the tarplant.

Secondary water source

In the event that the reduced pool within the preserve fails to pond water, it may become necessary to bring water into the system, either passively, through drainage from outside the preserve, or actively, via a pump system or spigot. Ideally, water brought into the pool should be as close to untreated rainwater as possible; therefore, tap water (i.e., directly from a spigot) and "pure" street runoff carrying potential contaminants would not be acceptable. We therefore recommend that at least one of the bioswales proposed for the site (in association with the transit center) be located near the preserve, perhaps connected by a wooded weir to allow for easy transport of water into the preserve during dry periods. It is possible that a "nursery" for southern tarplant proposed for the site just south of the proposed reserve against the railroad right-of-way could serve as this bioswale.

Additional species to be planted

In addition to augmenting the population of the southern tarplant in the preserve, we also propose to introduce a limited array of native vernal pool and alkali lowland plant species known to occur (or to have occurred) at nearby Madrona Marsh Preserve, from material collected at that location or nearby. Table A2 (Appendix) presents suggestions for a local plant palette to guide these introductions based on Cooper and Fiesler (2012), which would most likely involve direct seeding of the site from local material, since no irrigation would be present at the tarplant preserve. This list is for information purposes only; we are not proposing to plant any particular species at this point, since our main focus is southern tarplant. However, if the opportunity arises to introduce local natives into the system without compromising the success of the tarplant, these would be the species to consider.

Alternative site preparation

Despite careful planning and implementation, nature doesn't always behave predictably. Numerous experts we consulted stressed the need to be flexible in terms of "where you want the tarplant to go". For this reason, it is possible that the proposed restoration will not achieve the desired results, and that a large, viable southern tarplant population will not develop within five years within the preserve. For reason, we suggest identifying at least one alternate area around the RTC site that could be made suitable for southern tarplant, in a way compatible with proposed and expected uses for the site. Examples include small openings in and around the landscape and parking lot edges, adjacent to the railroad right-of-way, etc. This would provide needed insurance against failure of the primary restoration site (the preserve), and could allow for success with very little change in management and aesthetics of the proposed transit center.

Such an alternate area would ideally be at least 3' wide (i.e., enough to allow a mature tarplant to grow and spread) and would be a place where water would be allowed to pool. It could be landscaped initially with ornamental species (but not with grasses, which are very hard to fully eradicate) during project initiation, and later, if necessary, could be re-landscaped using southern tarplant (with appropriate site preparation, such as packed soil, low/no irrigation, and seeding or direct planting, as outlined above).

Maintenance and Monitoring

The need for site-specific maintenance plans for preserves with native landscaping was recently discussed by Mackey and Steele (2013).

Soils and mulch

The soil needs of the southern tarplant are complex, and may vary from site to site depending on available microhabitat. In many areas, the species occurs in hard-packed, seasonally-flooded, somewhat alkaline soils. However, the species may also colonize atypical habitat if present nearby, such as disced field-like sites. While flat areas are most likely to support the species, it may also volunteer on slopes, such as the edges of bioswales and retention basins, but typically only if it is already growing in the vicinity (fide D. Hubbard, UCSB). Because soils near the coast of southern California are often naturally alkaline (particularly in the Los Angeles Basin where the study site is located), soil amendments to increase the ph level should not be necessary; however, this could be explored through adaptive management if the species does not thrive during restoration attempts.

Mulch, which is often spread over planting beds and around shrubs and trees to help retain soil moisture, should be avoided completely, as the species appears to germinate best in bare sites, or under a sparse canopy of grasses and weeds.

Irrigation and runoff

Southern tarplant requires winter flooding as well as prolonged dry periods during late spring, summer, and early fall. Therefore, irrigation – even of young plants – should not be necessary or beneficial. Seedlings may require irrigation when first planted, but this could be done on an as-needed basis, by hand (we recommend planting shortly after the first rain of the season, and only irrigating if no more rain comes for at least several weeks afterward).

Weed management

Weed management is essential to the establishment of this species at many sites, and as southern tarplant is basically a weed, extreme care must be taken to ensure that the restoration is continuously disturbed, and the other weeds that will inevitably invade are kept at bay. Based on our observations at the site, and on previous work at nearby Madrona Marsh Preserve, a wide variety of weeds occur currently, and additional species will inevitably invade, depending on a variety of factors, including climatic conditions (e.g., a few unusually dry or wet years), stochastic and unpredictable events (e.g., "contaminated" machinery from a nearby construction site), and other forces.

The distinction must be made between weeds that are relatively innocuous with respect to their likely impact on southern tarplant and native vernal pool communities, and those that will likely present an impediment to the species' ability to thrive here. In general, the most problematic species are those that may become dense and/or super-abundant at a given site, with a large amount of biomass close to the ground, and those that will either germinate in late spring, or that will maintain lush growth during that time of year.

In addition, there are certain locally native species that must be considered at least a temporary threat to the future of southern tarplant at the site, for similar reasons as the non-natives – their presence inhibits the ability of southern tarplant to either gain a foothold here or prohibits it from thriving long-term.

Preliminarily, the species listed in Table 1 are present on the site currently, and pose a potential threat to southern tarplant here and should therefore be considered for future control here. Several of these are perennial, and may be treated immediately, either using a "weed wrench", limited herbicide application (e.g. Round-up), or a work crew with a multi-day commitment. These include Australian saltbush and Pampas-grass, which are essentially small shrubs, while Bermuda grass and smilo grass are persistent, perennial grasses.

Other species may be treated simply by hand-pulling as they emerge in spring. Some may be extremely spiny and therefore require gloves and protective clothing, such as pigweed and Russian thistle; others are less threatening, and could be removed even by students or volunteers (also wearing gloves), such as prickly lettuce, white sweet-clover, cutleaf evening-primrose, and swamp pricklegrass.

RECON (2012) provided guidance on hand-removing weeds at southern tarplant restoration sites:

> "Hand removal will consist of cutting vegetation at the base and removing the dead biomass from the restoration area. Careful attention will be paid towards not disturbing the soil surface by uprooting the plant materials[12]. Volunteers [or staff] will be trained on recognizing anticipated and abundant weed species they will commonly encounter…if new weeds are discovered, work crews will be trained to recognize those species appropriately…It is likely that hand weeding will occur during the growing season from late winter through spring depending on rainfall patterns. If removing weeds by hand has not been completed by the time weed species begin to set seed, weed eradication activities may be implemented by a restoration crew.

Native species are unlikely to interfere with southern tarplant restoration, but after an unusually rainy winter, riparian species – already common at the site – could become established in the pool area(s) and thus inhibit the development of a tarplant population. Thus, we recommend the following be monitored at the site (informally), rather than targeted from the outset: coyotebush (*Baccharis pilularis*), mulefat (*Baccharus salicifolia*) and willows (*Salix* spp.).

Table 1. Potentially competitive weeds (to a restored southern tarplant population) at the RTC site.

Species	**Current status**	**Rationale**
Pigweed (*Amaranthus albus*)	Several patches; growing vigorously in northwest corner September 2013.	Germinates and grows in summer, on both wet and dry soil (prefers a small amount of water).
Prickly lettuce (*Lactuca serriola*)	Common as scattered plants.	Favors disturbed soil; can form dense patches (but can also persist as a sparse, uncommon weed some years)
Australian saltbush (*Atriplex semibaccata*)	Many patches throughout site, particularly in pool areas that are seasonally flooded.	A spreading perennial with very similar habitat needs to southern tarplant (brief flooding); hard to eradicate.
Russian thistle (*Salsola tragus*)	Common as scattered plants.	Favors disturbed soil; can form dense patches (but can also persist as a sparse, uncommon weed some years)
White sweet-clover (*Melilotus alba*)	Fairly common at wetland margins.	Can form dense thickets if consistently flooded.
Cutleaf evening-primrose (*Oenothera laciniata*)	Several plants along northwestern fenceline.	Spreading annual that can be mat-forming; often in same alkali edge areas as southern tarplant.
Pampas-grass (*Cortaderia selloana*)	Scattered plants, no large infestations (yet).	Thoroughly invasive and ecologically transforming, forming tall hummocks; Almost impossible to remove once

[12] Confirm with staff (e.g., Tracy Drake) that this is necessary from her experience at Madrona Marsh Preserve; it may not be.

		established.
Swamp pricklegrass (*Crypsis schoenoides*)	Appears to be newly-invading.	Mat-forming; though annual, tends to grow vigorously in mid- and late-summer.
Bermuda grass (*Cynodon dactylon*)	Extensive patches; probably the dominant perennial grass on the site.	Will likely invade and become establish in any seasonal pool (without control).
Smilo grass (*Stipa miliaceae* var. *miliaceae*)	Common in moister areas, but not currently extensive.	A pernicious perennial, able to form mats and thatch.

Other species that could invade and pose a problem, but thus far have not, include fennel (*Foeniculum vulgare*) and garland chrysanthemum (*Chrysanthemum coronarium*); both occur at nearby Madrona Marsh Preserve, and their control has proven possible, if difficult.

We recommend the development of a weed management schedule that includes an initial grass and shrub removal (e.g., for Australian saltbush, pampas-grassland, Bermuda/smilo grass others), and periodic (e.g., quarterly) monitoring to assess whether they are re-invading.

Each spring (e.g., in March), we recommend weekly visits by a restoration team at least through the end of the April, carefully walking the site and pulling up emerging invasives (from Table 1) that appear, such as Russian thistle, prickly lettuce, etc. These can be kept at bay, but only through close attention and persistent weed-pulling.

Table 2 presents a sample maintenance schedule for the site.

Regarding herbicide treatment, RECON (2012) recommends it as a last resort (to control weeds that cannot be effectively or safely removed and kept out), writing the following:

> "As a last resort, any weeds that cannot be controlled through hand removal or mechanical efforts prior to flowering and setting seed will be treated through herbicide applications by contracted workers. Herbicide applications are an inexpensive and effective method for weed control. Herbicide will be applied by hoses extending from skid mounted spray trucks or backpack sprayers so that spot treatments can be made directly to foliage of weed species avoiding contact with native and sensitive species. Any herbicide used must be approved for use by (California Department of Fish and Wildlife) for use in natural areas and its use will follow all (CDFW) rules and regulations.
>
> "Glyphosate is the preferred chemical for controlling the weed species present at the restoration area since it is a broad-spectrum contact herbicide that treats hundreds of different types of commonly encountered weed species. Two formulas of glyphosate are appropriate for weed control at the restoration area: AquaMaster® and Prosecutor® (or other commercial equivalents). Both herbicides are approved for use in natural areas by USFWS and (CDFW) and must be applied by a licensed applicator. Prosecutor® can be used in upland areas and AquaMaster® is approved for use in aquatic sites."

Pest management

It may not be necessary to use pesticides or other chemicals (other than, perhaps, a weak, non-toxic herbicide to control invasive grasses and shrubs). While herbicide was recommended to be avoided for some early southern tarplant restoration projects (e.g., Holmes 2010), it has been recommended for use more recently (e.g., RECON 2012, LAWA 2012), and should be considered potential "tool in the toolbox" should weeds prove a major impediment to tarplant germination and success at the restoration site.

Hardscape, litter and vandalism

The site currently contains a small amount of debris that should be removed prior to site preparation, including two large blocks of cement adjacent to the proposed preserve. Vandalism of natural areas, aside from simply being unsightly, can effectively turn opinion against conservation. If the public sees a neglected weedy lot strewn with garbage, rather than an attractive, cared-for preserve, it will conclude that the area has no value. The proposed preserve will always be surrounded by land uses having little to do with nature preservation, and will thus need to "stand on its own", and communicate its purpose, hopefully at a glance, or with simple signage.

We recommend installing a 6'-high fence around the preserve, at least initially, to keep people from entering and vandalizing the site. Litter should be removed as quickly as possible, and managers must realize that large, bulky items will be dumped at the site almost immediately, including (in our experience) furniture, automobile parts (especially batteries), toys, landscaping trimmings (including large branches), and Christmas trees. Vandals often attempt to dump these items over fences, damaging fences and/or shattering glass. A security system installed at the RTC site should assist in reducing vandalism at the preserve.

Table 2. Monthly checklist for southern tarplant restoration.

Task	Jan. – April	May – August	Sept./Oct.	Nov./Dec.
Site preparation				
Soil banking		Y1	Y1	
Debris/goat dropping removal	Y1			
Soil prep/pool creation		Y1; Y2 as needed	Y1; Y2 as needed	
Nursery/bioswale construction	(with construction of project)			
Alternative site prep	Y3-5, as needed	Y3-5, as needed	Y3-5, as needed	Y3-5, as needed
Weeding				
Hand-pulling	Weekly	As needed	As needed	As needed
Mechanical		Y1; then as-needed	Y1; then as-needed	
Herbicide (de-thatching)		Y1-2, as needed	Y1-2, as needed (prior to broadcasting/ planting)	
Seeding/growing				
Seed collection		Collect seed from RTC site Y1, then from restoration site Y2-4	Collect seed from RTC site Y1, then from restoration site Y2-4	Collect seed from RTC site Y1, then from restoration site Y2-4
Seed broadcast			Broadcast (60% of) seeds following 2nd rain	Broadcast remaining seeds
Cultivation	Grow seedlings at MMP nursery Y1 (Y2-4, as needed)	Grow seedlings at MMP nursery Y1 (Y2-4, as needed)	Plant seedlings at MMP nursery Y1-2 (Y3 as needed)	Plant seedlings at MMP nursery Y1-2 (Y3 as needed)
Irrigation (hand-watering)			As needed (following broadcasting seed/ planting)	As needed (following broadcasting seed/ planting)
Irrigation (passive)	(As-needed, via bioswale)			
Hardscape/litter	Weekly, after Y1 debris removal	Weekly	Weekly	Weekly
Monitoring	Annual report due			
		Flag/map all occurrences of s. tarplant (at RTC + reference site)	Flag/map all occurrences of s. tarplant (at RTC + reference site)	Flag/map all occurrences of s. tarplant (at RTC + reference site)

Monitoring and reporting

RECON (2012) recommended specific monitoring measures for a southern tarplant restoration site in Seal Beach, which we have adapted below.

Southern tarplant monitoring will occur throughout the restoration site/preserve annually for the first five years following the broadcast of seed, not inclusive of that initial year. All southern tarplant individuals growing in the restoration area will be counted monthly from 10 May through 30 September by members of the restoration team. The total number of live plants and flowering individuals will be counted during each visit, and the locations of individuals, and the boundaries of "subpopulations" (groups of >20 individuals) will be mapped with a GPS unit. Permanent photo points will be established for at least four suitable locations. Weed and native species growing in association with southern tarplant will also be noted, and their abundance estimated, during each visit so that they can be controlled.

A reference population of southern tarplant will identified at Madrona Marsh Preserve, in an area with similar conditions to the preserve site. This reference population will be used to assess and compare annual population fluctuations at both the RTC site and the reference site (e.g., to assess the effects of seasonal rainfall or exceptionally cool spring weather, etc.). Brief comparisons between the two sites will be included in the annual report each year.

All easily visible pollinators observed using southern tarplant will be photographed and identified to the extent possible (e.g., bees, bee flies, and butterflies), with date information associated with each photograph. Pollinators at the reference site will also be photographed and compared to those from the restoration area. Native insect species using southern tarplant at the RTC site were photographed (by Cooper) in 2013, and identified to genus.

They include:

- The bee fly *Thyridanthrax atratus* (Figure 10a)
- The bee fly *Thyridanthrax pallidus* (Figure 10b)
- The bee fly *Poecilanthrax arethusa* (Figure 10c)
- The bee *Augochlorini pomoniella* (Figure 10d)
- A bee in the genus *Anthophora* (Figure 10e)

See below for photographs of each.

Southern tarplant restoration will be considered successful at the site if:

- The population within the preserve reaches 900-1,200 individuals (3:1 existing population estimate) in at least two of the five years of monitoring[13];
- The restored southern tarplant are attracting native pollinators, including but not limited to those listed above;
- The population throughout the restoration area does not show a decline in years three

[13] Other plans (e.g., City of Seal Beach 1997) have recommended percentage thresholds for number of plants germinating as a indicator of success (e.g., 60% of seeds germinating the first year); however, given the "naturally" boom/bust nature of the species, and the difficulty of measuring this given the sheer number of seeds that will be broadcast (from hundreds of individual plants), this seems unrealistic.

through five, unless the population at the reference site exhibits the same pattern and magnitude of decline over those same years.

If the success criteria listed above are not reached, CDFW, Friends of Madrona Marsh, and City staff may discuss appropriate adaptive management strategies.

Figure 10a. *Thyridanthrax atratus* (on seaside heliotrope). Note solid black body, two-toned wings with pale tips.

Figure 10b. *Thyridanthrax pallidus*. Note dull, "horsefly-like" appearance.

Figure 10c. *Poecilanthrax arethusa* (on southern tarplant). Note "calico" appearance to both wings and body.

Figure 10d. *Augochlorini pomoniella*, a tiny metallic-green sweat bee (on southern tarplant; note size difference between it and *Pecilanthrax arethusa*, above).

Figure 10e. *Anthophora* sp., a small, stout bee with grayish and black abdominal bands (with pollen from southern tarplant on legs)

Monthly checklist

See Table 2.

Responsibilities

City of Torrance

The city is the lead for this project, and is responsible for funding and coordination related to mitigating impacts to southern tarplant at the RTC site, creating a suitable restoration site, maintaining this site as a preserve for southern tarplant in perpetuity. City staff (ideally from Madrona Marsh Preserve, where a large population southern tarplant has been successfully managed for years) will be responsible with many of the activities involving the site preparation, planting, and maintenance of the preserve at the RTC site.

California Department of Fish and Wildlife

As the regulatory agency charged with administration of the California Environmental Quality Act (CEQA), CDFW must be notified about any activity that may potentially impact southern tarplant, a CNPS-ranked sensitive species that is regulated under CEQA. CDFW staff may approve conceptual and actual restoration plans, may review and comment on documents associated with development of the RTC site, and may review and assist with seeding/planting and monitoring as the plan is implemented.

Restoration team

Led by Tracy Drake, Manager, Madrona Marsh Preserve, this team will consist of city staff and volunteers whose responsibility it will be to manage and monitor the tarplant preserve at the RTC site. Examples of tasks include collecting and planting seed and plants, assisting in site preparation, monitoring water levels, counting emerging plants, and estimating reproductive output each season. The restoration team would report to the City Manager or their designee, and may be asked to serve as a liaison between the city and regulatory agencies (e.g., CDFW) on the project.

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Appendix

Table A1. Elevational range of southern tarplant on RTC site.

Crenshaw RTP Site - Southern Tarplant Summary Table									
Label	Low	High	Area (acres)	Area (ft)	% of site	# of plants	Density (# plants/acre)		Tarplant Pool Summary
61'-62'	61	62	0.003	141.55	0.02%	0	0		
62'-63'	62	63	0.003	139.25	0.02%	0	0		
63'-64'	63	64	0.036	1577.57	0.24%	0	0		
64'-65'	64	65	0.023	990.55	0.15%	0	0		
65'-66'	65	66	0.021	899.74	0.14%	0	0		
66'-67'	66	67	0.032	1381.33	0.21%	0	0		
67'-68'	67	68	0.175	7641.37	1.16%	11	63		***Primary shoreline (68'-70' range)***
68'-69'	68	69	2.151	93698.54	14.27%	159	74		*Total site area at this range*
69'-70'	69	70	3	130676	19.91%	45	15		*224374.72*
70'-71'	70	71	2.045	89087.10	13.57%	2	1		*34.1%*
71'-72'	71	72	1.461	63644.94	9.70%	10	7		***Total Pool Area (67'-75' range)***
72'-73'	72	73	1.003	43686.47	6.65%	11	11		*Total site area at this range*
73'-74'	73	74	0.783	34094.49	5.19%	10	13		*527619.40*
74'-75'	74	75	1.494	65090.31	9.92%	7	5		*80.3%*
75'-76'	75	76	0.717	31240.91	4.76%	0	0		
76'-77'	76	77	0.46	20022.58	3.05%	0	0		
77'-78'	77	78	0.444	19357.89	2.95%	0	0		
78'-79'	78	79	0.97	42237.44	6.43%	0	0		
79'-80'	79	80	0.193	8406.38	1.28%	0	0		
80'-81'	80	81	0.066	2870.85	0.44%	0	0		
81'-82'	81	82	0.006	244.28	0.04%	0	0		
82'-83'	82	83	0	4.24	0.00%	0	0		
Sums			**15 acres**	**657134.0 sq. Feet**	**100.10%**	**255 plants**	**16.9 plants/acre**		

Table A2. Suggested native species for seeding/planting in Torrance area.

(After Cooper and Fiesler 2012). Note: Species characteristic of southern California vernal pools are shaded yellow.

Family	Latin name	English name	Status at Madrona Marsh Preserve	CNPS status	Status at RTC
Aizoaceae	Sesuvium verrucosum	Sea-purslane	Extirpated	None	
Alismataceae	Alisma plantago-aquatica	Water plantain	Natural	None	
Alismataceae	Sagittaria sp.		Absent	None	
Anacardiaceae	Malosma laurina	Laurel sumac	Absent	None	
Anacardiaceae	Rhus integrifolia	Lemonadeberry	Introduced	None	
Apiaceae	Apiastrum angustifolium	Wild carrot	Absent	None	
Apiaceae	Daucus pusillus	Rattlesnakeweed	Absent	None	
Apiaceae	Eryngium aristulatum var. parishii	San Diego button-celery	Absent	1B.1	
Apiaceae	Lomatium utriculatum	Common lomatium	Absent	None	
Apiaceae	Sanicula arguta	Snakeroot	Absent	None	
Apiaceae	Sanicula crassicaulis		Absent	None	
Ascepiadaceae	Asclepias eriocarpa		Absent	None	
Ascepiadaceae	Asclepias fascicularis		Absent	None	
Asteraceae	Achyrachaena mollis	Blow-wives	Absent	None	
Asteraceae	Ambrosia acanthicarpa	Sand-bur	Natural	None	
Asteraceae	Ambrosia psilostachya	Western ragweed	Natural	None	
Asteraceae	Artemisia californica	California sagebrush	Introduced	None	
Asteraceae	Artemisia douglasiana	Mugwort	Introduced	None	
Asteraceae	Artemisia dracunculus	Wild tarragon	Absent	None	
Asteraceae	Baccharis douglasii		Absent	None	
Asteraceae	Baccharis emoryi	Emory's baccharis	Absent	None	Present?
Asteraceae	Baccharis pilularis	Coyotebush	Nat./Intr.	None	Present
Asteraceae	Baccharis salicifolia	Mulefat	Nat./Intr.	None	Present
Asteraceae	Bidens frondosa	Devil's beggar's ticks	Natural	None	
Asteraceae	Blennosperma nanum	Common stickyseed	Absent	None	
Asteraceae	Chaenactis glabriuscula	Yellow pincushion	Absent	None	
Asteraceae	Cirsium brevistylum		Absent	None	
Asteraceae	Erigeron canadensis	Horseweed	Natural	None	Present
Asteraceae	Eclipta prostrata	False daisy	Natural	None	
Asteraceae	Encelia californica	Bush sunflower	Introduced	None	
Asteraceae	Ericameria palmeri	Palmer's goldenbush	Absent	None	
Asteraceae	Euthamia occidentalis	Western goldenrod	Absent	None	
Asteraceae	Gnaphalium bicolor	Two-toned everlasting	Absent	None	
Asteraceae	Gnaphalium canescens ssp. microcephalum	White everlasting	Natural	None	
Asteraceae	Gnaphalium palustre	Lowland cudweed	Natural	None	
Asteraceae	Gnaphalium stramineum	Cotton-batting plant	Natural	None	Present?
Asteraceae	Grindelia camporum	California gumplant	Absent	None	

Asteraceae	Grindelia hirsutula		Absent	None	
Asteraceae	Gutierrezia californica	Matchweed	Absent	None	
Asteraceae	Helianthus annuus	Common sunflower	Natural	None	
Asteraceae	Hemizonia fasciculata	Fascicled tarplant	Natural	None	
Asteraceae	Hemizonia parryi ssp. australis	Southern tarplant	Natural	1B.1	Present
Asteraceae	Heterotheca grandiflora	Telegraph weed	Natural	None	Present
Asteraceae	Isocoma menziesii	Coast goldenbush	Introduced	None	
Asteraceae	Lasthenia californica	Goldfields	Absent	None	
Asteraceae	Lasthenia glabrata	Coulter's goldfields	Absent	None	
Asteraceae	Layia platyglossa	Tidy-tips	Absent	None	
Asteraceae	Lessingia filaginifolia	California-aster	Absent	None	
Asteraceae	Malacothrix saxatilis	Cliff-aster	Absent	None	Present
Asteraceae	Microseris lindleyi	Silverpuffs	Absent	None	
Asteraceae	Pluchea purpurascens		Absent	None	
Asteraceae	Psilocarphus brevissimus	Wooly-heads	Natural	None	
Asteraceae	Stephanomeria diegensis	San Diego wreathplant	Natural	None	
Asteraceae	Stephanomeria exigua	Small wreathflower	Absent	None	
Asteraceae	Stephanomeria virgata	Virgate wreath-plant	Absent	None	
Asteraceae	Symphiotrichum divaricatus	Slender aster	Absent	None	
Asteraceae	Xanthium spinosum	Spiny cocklebur	Absent	None	
Asteraceae	Xanthium strumarium	Rough cocklebur	Natural	None	
Azollaceae	Azolla filiculoides	Duckweed	Natural	None	
Boraginaceae	Amsinckia menziesii	Fiddleneck	Nat./Intr.	None	Present
Boraginaceae	Cryptantha clevelandii	Popcorn-flower	Absent	None	Present?
Boraginaceae	Cryptantha intermedia	Intermediate popcorn-flower	Absent	None	
Boraginaceae	Heliotropium curassavicum	Seaside heliotrope	Natural	None	Present
Boraginaceae	Pectocarya linearis		Absent	None	
Boraginaceae	Plagiobothrys collinus var. californicus	Popcorn-flower	Absent	None	
Brassicaceae	Caulanthus lasiophyllus		Absent	None	
Brassicaceae	Descurainia pinnata	Western/yellow tansy mustard	Introduced	None	
Brassicaceae	Erysimum insulare ssp. suffrutescens	Dune wallflower	Introduced	4.2	
Brassicaceae	Lepidium lasiocarpum	Hairypod pepperweed	Absent	None	
Brassicaceae	Lepidium nitidum	Shiny peppergrass	Absent	None	
Brassicaceae	Planodes virginicum		Absent	None	
Brassicaceae	Rorripa palustris	Western bog yellow cress	Absent	None	
Callitrichaceae	Callitriche marginata	Winged callitriche	Natural	None	
Capparaceae	Peritoma arborea	Bladderpod	Introduced	None	
Caprifoliaceae	Sambucus nigra ssp. caerulea	Blue elderberry	Introduced	None	
Caryophyllaceae	Cardionema ramosissimum		Absent	None	
Caryophyllaceae	Spergularia macrotheca	Sand-spurrey	Absent	None	
Caryophyllaceae	Spergularia platensis		Absent	None	
Caryophyllaceae	Spergularia salina	Saltmarsh sand-	Extirpated	None	

		spurrey			
Chenopodiaceae	Atriplex lentiformis	Quailbush	Introduced	None	
Chenopodiaceae	Atriplex serenana		Absent	None	
Chenopodiaceae	Chenopodium berlandieri	Berlandier's goosefoot	Natural	None	
Chenopodiaceae	Chenopodium californicus	California goosefoot	Absent	None	
Chenopodiaceae	Chenopodium leptophyllum		Absent	None	
Chenopodiaceae	Salicornia virginica	Pickleweed	Absent	None	
Convolvulaceae	Calystegia macrostegia	Morning-glory	Absent	None	
Convolvulaceae	Convolvulus simulans		Absent	4.2	
Convolvulaceae	Cressa truxillensis	Alkali weed	Absent	None	
Convolvulaceae	Cuscuta pentagona	Western field dodder	Natural	None	
Crassulaceae	Crassula aquatica	Water pygmy-weed	Natural	None	
Crassulaceae	Crassula connata	Sand pygmy-weed	Natural	None	
Cucurbitaceae	Cucurbita foetidissima	Calabazilla	Introduced	None	
Cyperaceae	Cyperus eragrostis	Umbrella-sedge	Natural	None	
Cyperaceae	Cyperus odoratus	Fragrant flatsedge	Natural	None	
Cyperaceae	Eleocharis acicularis	Needle spikerush	Extirpated	None	
Cyperaceae	Eleocharis coloradoensis	Dwarf spikerush	Absent		
Cyperaceae	Eleocharis macrostachya	Common spikerush	Natural	None	Present
Cyperaceae	Eleocharis montevidensis	Sand spikersh	Absent		
Cyperaceae	Scirpus acutus	Spikerush	Absent	None	
Cyperaceae	Schoenoplectus americanus	American tule	Absent	None	
Cyperaceae	Schoenoplectus californicus	California bulrush	Natural	None	
Cyperaceae	Bolboschoenus maritimus	Prairie bulrush	Natural	None	Present
Elatinaceae	Elatine brachysperma	Shortseed waterwort	Absent		
Elatinaceae	Elatine californica	California waterwort	Natural	None	
Elatinaceae	Elatine rubella	Southwestern waterwort	Extirpated	None	
Equisetaceae	Equisetum laevigatum	Horsetail	Absent	None	
Euphorbiaceae	Croton californicus	California croton	Nat./Intr.	None	Present
Euphorbiaceae	Croton setigerus	Dove weed, Turkey mullein	Natural	None	
Euphorbiaceae	Chamaesyce albomarginata	Rattlesnake weed	Natural	None	Present
Euphorbiaceae	Chamaesyce polycarpa		Absent	None	
Euphorbiaceae	Chamaesyce serpens	Sandmat spurge	Natural	None	
Euphorbiaceae	Chamaesyce serpyllifolia	Thymeleaf spurge	Natural	None	
Fabaceae	Astragalus trichopodus var. lonchus	Coastal locoweed	Introduced	None	
Fabaceae	Acmispon americanus	Spanish-clover	Natural	None	Present
Fabaceae	Acmispon brachycarpus	Hill lotus	Natural	None	
Fabaceae	Acmispon glaber	Deerweed	Nat./Intr.	None	
Fabaceae	Acmispon strigosus	Bishop lotus	Natural	None	
Fabaceae	Lupinus albifrons	Silver bush lupine	Absent	None	
Fabaceae	Lupinus bicolor	Miniature lupine	Natural	None	Present
Fabaceae	Lupinus chamissonis	Dune bush lupine	Introduced	None	
Fabaceae	Lupinus longifolius	Bush lupine	Absent	None	
Fabaceae	Lupinus sparsiflorus	Coulter's lupine	Absent	None	
Fabaceae	Lupinus succulentus	Arroyo lupine	Nat./Intr.	None	

Fabaceae	Lupinus truncatus	Collar lupine	Nat./Intr.	None	Present
Fabaceae	Trifolium ciliolatum		Absent	None	
Fabaceae	Trifolium gracilentum	Pin point clover	Absent	None	
Fabaceae	Trifolium willdenovii	Tomcat clover	Absent	None	
Frankeniaceae	Frankenia salina	Alkali heath	Absent	None	
Hydrophyllaceae	Phacelia cicutaria	Caterpillar phacelia	Absent	None	
Hydrophyllaceae	Phacelia ramosissima	Strand phacelia	Introduced	None	
Hydrophyllaceae	Pholistoma auritum	Fiesta-flower	Absent	None	
Juncaceae	Juncus balticus	Baltic rush, wire rush	Absent	None	
Juncaceae	Juncus bufonius	Toad rush	Natural	None	
Juncaceae	Juncus mexicanus		Absent		
Laminaceae	Salvia columbariae	Chia	Introduced	None	
Lemnaceae	Lemna minor	(duckweed)	Absent	None	
Lemnaceae	Lemna minuta	(duckweed)	Natural	None	
Liliaceae	Bloomeria crocea	Goldenstars	Introduced	None	
Liliaceae	Calochortus catalinae	Catalina mariposa-lily	Absent	4.2	
Liliaceae	Dichelostemma capitatum	Blue dicks	Introduced	None	
Loasaceae	Mentzelia affinis	Blazing-star	Absent	None	
Malvaceae	Malvella leprosa	Alkali mallow	Natural	None	
Malvaceae	Sidalcea malviflora	Checker mallow	Absent		
Malvaceae	Sidalcea neomexicana	Salt spring checkerbloom	Absent	2.2	
Marsileaceae	Marsilea vestita	water-fern	Natural	None	Present
Nyctaginaceae	Abronia umbellata	Pink sand verbena	Absent	None	
Onagraceae	Camissoniopsis bistorta	Southern sun-cup	Absent	None	
Onagraceae	Camissoniopsis cheiranthifolia	Beach evening-primrose	Introduced	None	
Onagraceae	Camissoniopsis lewisii	Lewis's evening-primrose	Absent	(3 if wild)	
Onagraceae	Camissoniopsis micrantha	Small-flowered evening-primrose	Natural	None	
Onagraceae	Camissoniopsis strigulosa	Strigulose evening-primrose	Absent	None	
Onagraceae	Clarkia purpurea	Purple clarkia	Introduced	None	
Onagraceae	Epilobium ciliatum	Willow herb	Natural	None	
Onagraceae	Epilobium pygmaeum	Smooth boisduvalia	Natural	None	
Onagraceae	Ludwigia peploides	Marsh purslane	Absent		
Onagraceae	Oenothera elata	Hooker's evening-primrose	Natural	None	
Oxalidaceae	Oxalis albicans	California wood sorrel	Absent	None	
Papaveraceae	Eschscholzia californica	California poppy	Nat./Intr.	None	
Papaveraceae	Platystemon californicus	Cream-cups	Absent	None	
Plantaginaceae	Plantago bigelovii	Coast plantain	Absent	None	
Plantaginaceae	Plantago erecta	California plantain	Natural	None	
Plantaginaceae	Plantago subnuda		Absent	None	
Poaceae	Alopecurus carolinianus	Carolina foxtail	Absent	None	
Poaceae	Alopecurus saccatus	Pacific foxtail	Absent	None	
Poaceae	Bromus carinatus	California brome	Natural	None	
Poaceae	Deschampsia danthonioides	Annual hairgrass	Absent	None	

Poaceae	Distichlis spicata	Saltgrass	Natural	None	
Poaceae	Elymus triticoides	Alkali ryegrass	Absent	None	
Poaceae	Eragrostis mexicana ssp. virescens	Mexican lovegrass	Extirpated	None	
Poaceae	Hordeum jubatum	Foxtail barley	Absent	None	
Poaceae	Leptochloa uninervia	Sprangletop	Extirpated	None	
Poaceae	Orcuttia californica	California orcutt-grass	Absent	1B.1	
Poaceae	Paspalum distichum	Knotgrass	Natural	None	
Poaceae	Phalaris lemmonii	Lemmon's canary grass	Absent	None	
Poaceae	Poa secunda		Absent	None	
Poaceae	Setaria parviflora	Marsh bristlegrass	Natural	None	
Poaceae	Sporobolus airoides	Alkali sacaton	Absent	None	
Poaceae	Nassella lepida	Foothill needlegrass	Absent	None	
Poaceae	Nassella pulchra	Purple needlegrass	Introduced	None	
Poaceae	Festuca microstachys	Small fescue	Absent	None	
Polemoniaceae	Gilia angelensis	Angeles gilia	Absent	None	
Polemoniaceae	Gilia capitata	Globe gilia	Absent	None	
Polemoniaceae	Gilia splendens	Splendid gilia	Absent	None	
Polemoniaceae	Linanthus dianthiflorus		Absent	None	
Polemoniaceae	Navarretia fossalis		Absent	1B.1	
Polemoniaceae	Navarretia prostrata		Absent	1B.1	
Polygonaceae	Eriogonum gracile	Annual buckwheat	Natural	None	
Polygonaceae	Persicaria hydropiperoides	water smartweed	Natural	None	
Polygonaceae	Persicaria lapathifolium	Willow weed	Absent	None	
Polygonaceae	Persicaria punctata	(water smartweed)	Absent	None	
Polygonaceae	Rumex hymenosepalus	Sand dock	Absent	None	
Polygonaceae	Rumex salicifolius	Willow dock	Absent	None	
Portulacaceae	Calandrinia ciliata	Red-maids	Absent	None	
Portulacaceae	Claytonia perfoliata	Miner's lettuce	Absent	None	
Potamogetonaceae	Potamogeton pectinatus	Pondweed	Extirpated	None	
Ranunculaceae	Ranunculus californicus	California buttercup	Absent	None	
Rosaceae	Heteromeles arbutifolia	Toyon	Introduced	None	
Salicaceae	Populus fremontii	Fremont cottonwood	Nat./Intr.	None	
Salicaceae	Salix exigua	Sandbar willow	Introduced	None	
Salicaceae	Salix gooddingii	Black willow	Nat./Intr.	None	Present
Salicaceae	Salix lasiolepis	Arroyo willow	Nat./Intr.	None	Present
Saururaceae	Anemopsis californica	Yerba mansa	Absent	None	
Scrophulariaceae	Antirrhinum coulterianum	Coulter's snapdragon	Absent	None	
Scrophulariaceae	Castilleja exserta	Purple owl's-clover	Absent	None	
Scrophulariaceae	Collinsia heterophylla	Chinese houses	Introduced	None	
Scrophulariaceae	Linaria canadensis var. texana	Toadflax	Nat./Intr.	None	
Scrophulariaceae	Veronica peregrina ssp. xalapensis	Purslane speedwell	Natural	None	
Solanaceae	Datura inoxia		Absent	None	
Solanaceae	Datura wrightii	False jimson-weed	Absent	None	
Solanaceae	Solanum xanti	Chaparral nightshade	Absent	None	

Typhaceae	Typha dominigensis	Narrowleaf cattail	Absent	None	
Typhaceae	Typha latifolia	Broadleaf cattail	Natural	None	
Verbenaceae	Phyla lanceolata	Lanceleaf fogfruit	Absent	None	
Verbenaceae	Verbena bracteata	Bracted verbena	Extirpated	None	
Verbenaceae	Verbena lasiostachys	Prostrate vervain	Introduced	None	
Violaceae	Viola pedunculata	Johnny jump-up	Absent	None	
Vitaceae	Vitis girdiana	Desert wild grape	Introduced	None	

HELIX
Environmental Planning

Torrance Regional Transit Center

Dry Season Fairy Shrimp Survey and Hatching Report

October 13, 2014

Prepared for:
City of Torrance
20500 Madrona Avenue
Torrance, CA 90503

Prepared by:
HELIX Environmental Planning, Inc.
7578 El Cajon Boulevard, Suite 200
La Mesa, CA 91942

I certify that the information in this survey report and attached exhibits fully and accurately represent my work:

Jason Kurnow

Torrance Regional Transit Center
Dry Season Fairy Shrimp Survey and Hatching Report

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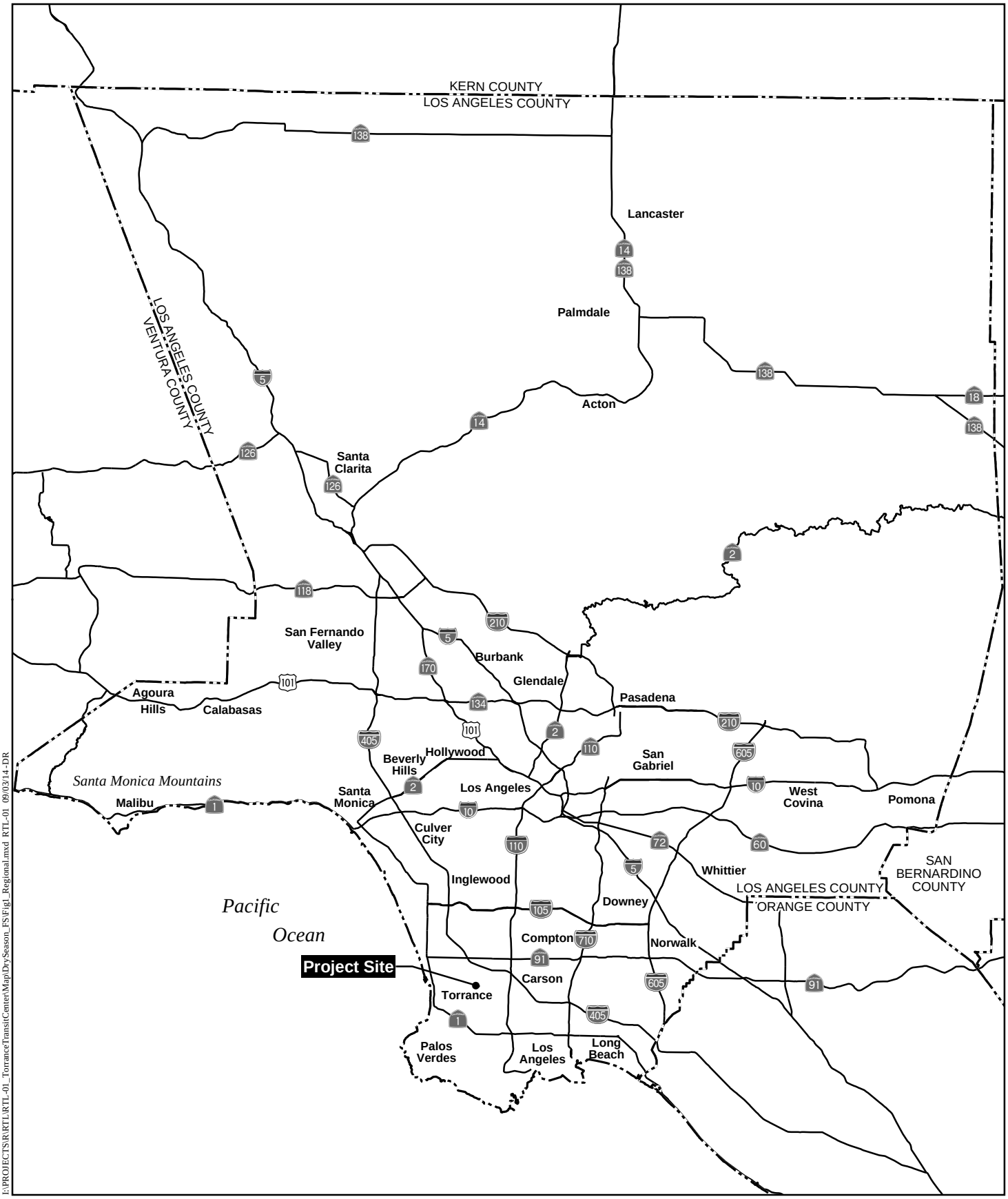
1.0 INTRODUCTION

This report presents the findings of the 2014 dry season fairy shrimp sampling conducted by HELIX Environmental Planning, Inc. (HELIX) in accordance with U.S. Fish and Wildlife Service (U.S. Fish and Wildlife Service [USFWS], 1996) protocol at the Torrance Regional Transit Center project site. The site is generally located north of Highway 1, south of Interstate 405, east of Highway 107, and west of Highway 213 in southern Los Angeles County, California (Figure 1). More specifically, the site occurs approximately 0.25-mile south of the Del Amo Boulevard and Crenshaw Boulevard intersection, near the address of 465 Crenshaw Boulevard in the northern portion of the City of Torrance (Figure 2). The site is depicted within an unsectioned portion of Township 4 South, Range 14 West of the Torrance, California U.S. Geological Survey (USGS) 7.5-minute quadrangle (Figure 3). The site contains features that have the potential to hold water for long enough periods to support fairy shrimp.

2.0 TARGET SPECIES INFORMATION

There are 5 species of fairy shrimp with potential to occur on site, 4 of which are known to occur within Los Angeles County, with one located as close as Orange County (Erikson and Belk 1999; USFWS 2007 and 2008; CNDDB 2014). Known Los Angeles County species include: Riverside fairy shrimp (*Streptocephalus woottoni*), giant fairy shrimp (*Branchinecta gigas*), alkali fairy shrimp (*B. mackini*), and versatile fairy shrimp (*B. lindahli*). Other species not currently known in Los Angeles County, but with potential to occur on site include San Diego fairy shrimp (*B. sandiegonensis*). The San Diego and Riverside fairy shrimp are federally listed as endangered, while the versatile fairy shrimp is relatively common and is not listed or considered sensitive. The alkali and giant fairy shrimp are also not listed species. San Diego fairy shrimp are found in San Diego and Orange counties and occur in vernal pools and other ephemeral ponds or basins. Riverside fairy shrimp can be found in Riverside, Orange, San Diego, and Los Angeles counties and occur in vernal pools and other ephemeral basins with long inundation times. The versatile fairy shrimp is common in pools throughout California and can co-occur with both San Diego and Riverside fairy shrimp. Both alkali fairy shrimp and giant fairy shrimp occur in alkaline basins. These two species can co-occur where their ranges overlap.

Fairy shrimp are adapted for variable and uncertain rainfall patterns. When fertilized by males of their species, female fairy shrimp produce “resting eggs,” called cysts, which are dormant embryos surrounded by hard-shelled membranes capable of remaining viable in the soil for long periods of time. Dry season fairy shrimp surveys are designed to detect, collect, and identify cysts present in the soil. The surface characteristics of these cysts can be used to differentiate the genus and potentially the species of fairy shrimp. Certain fairy shrimp, such as *B. lindahli* and *B. sandiegonensis*, cannot be identifiable to the species level by examination of the cysts alone. For these species, authorized hatching is performed as a component of the dry season survey to identify individuals to species level.



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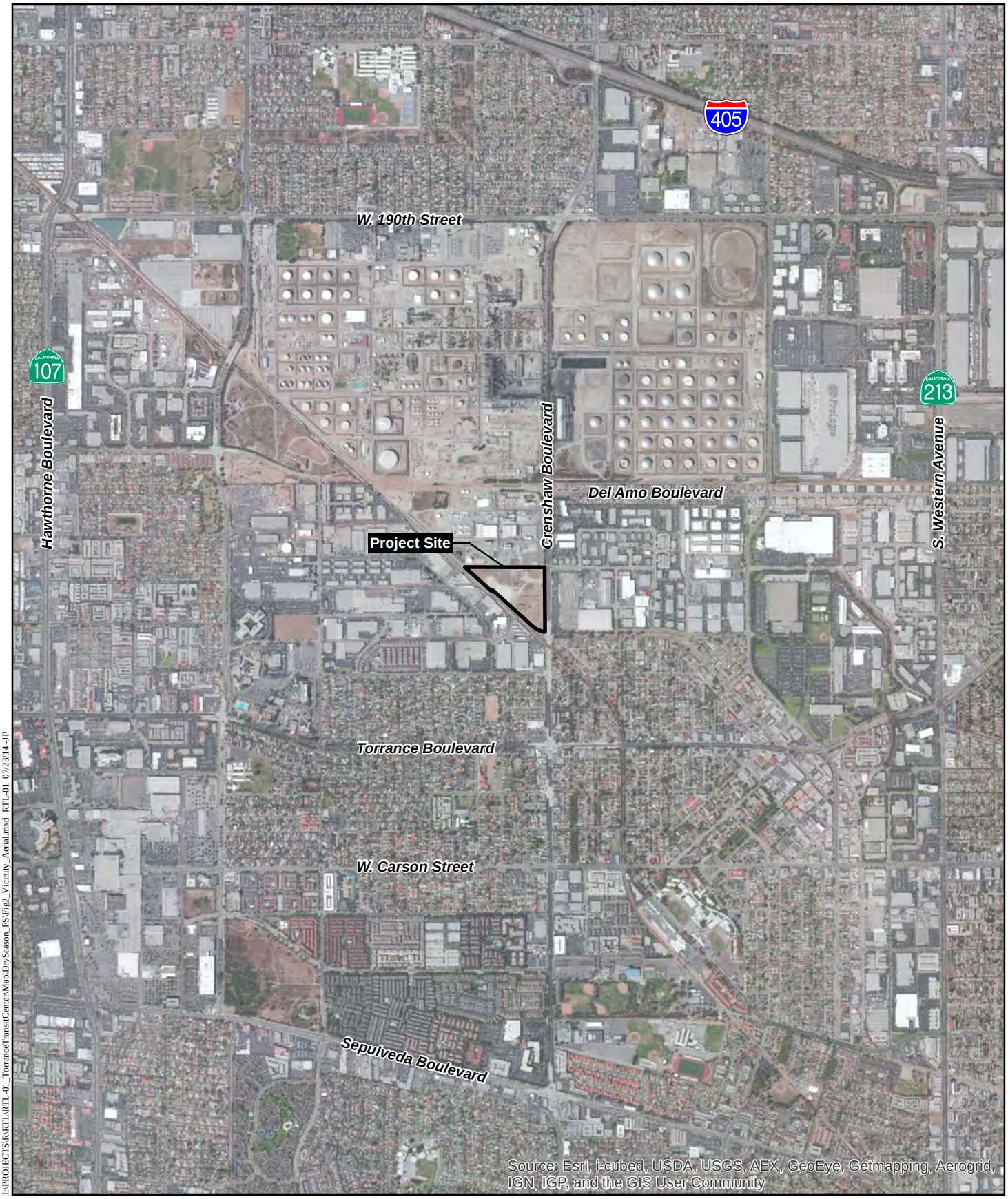
Regional Location Map

DRY SEASON FAIRY SHRIMP SURVEY FOR THE TORRANCE REGIONAL TRANSIT CENTER PROJECT

HELIX Environmental Planning

N 0 10 Miles

Figure 1



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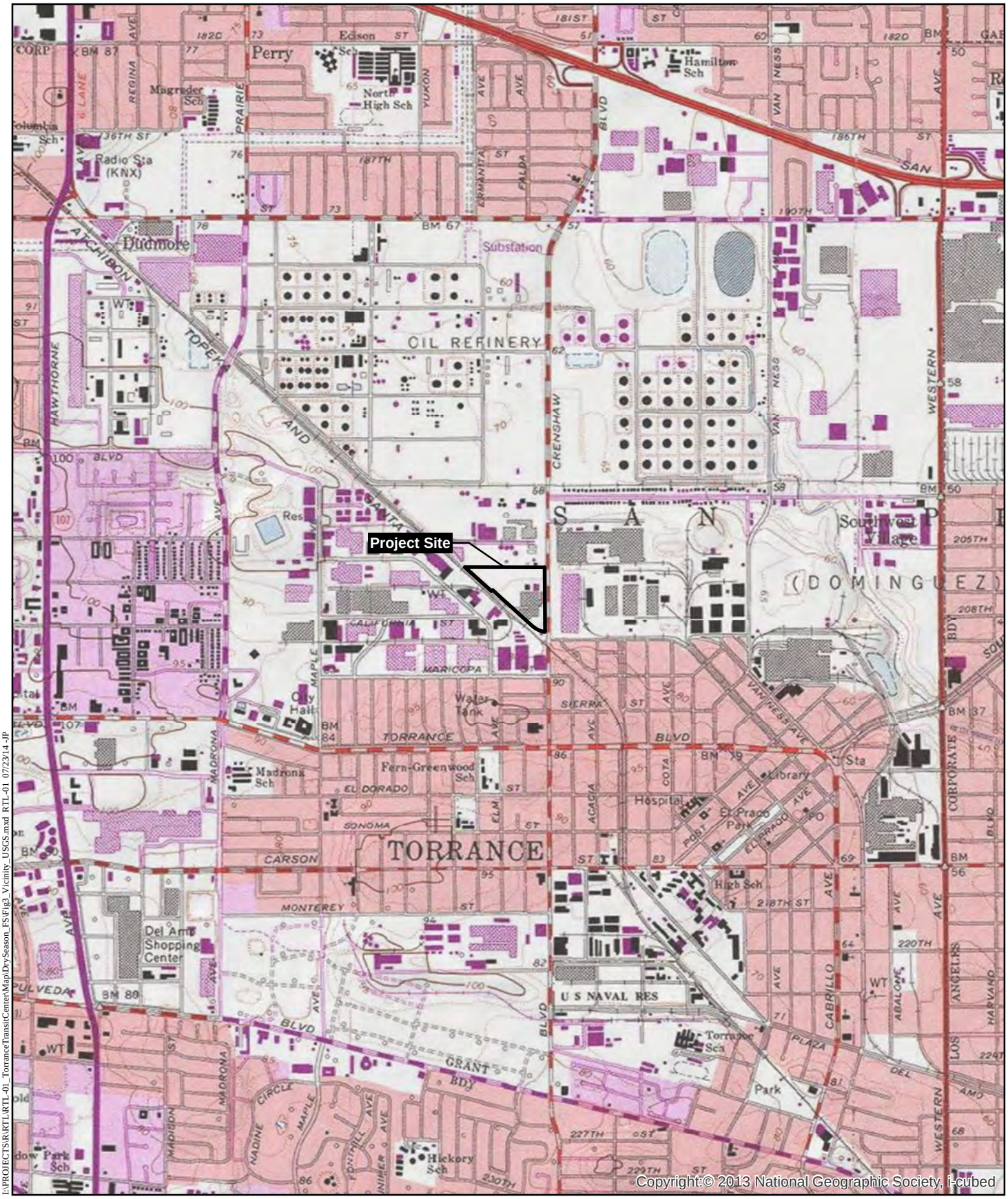
Project Vicinity Map (Aerial Photograph)

DRY SEASON FAIRY SHRIMP SURVEY FOR THE TORRANCE REGIONAL TRANSIT CENTER PROJECT

HELIX Environmental Planning

N 0 2,000 Feet

Figure 2



Project Vicinity Map (USGS Topography)

DRY SEASON FAIRY SHRIMP SURVEY FOR THE TORRANCE REGIONAL TRANSIT CENTER PROJECT

HELIX Environmental Planning

N 0 2,000 Feet

Figure 3

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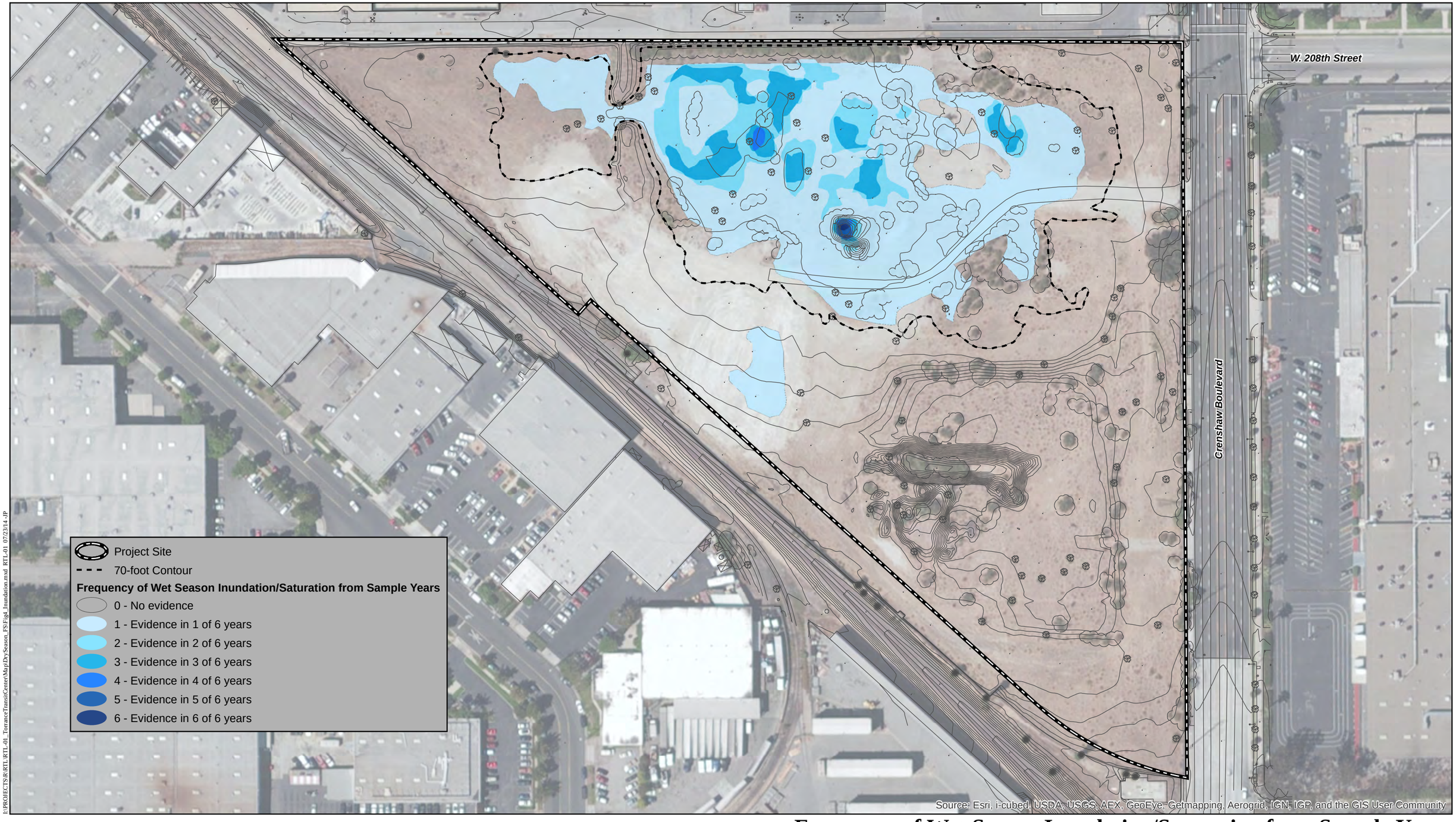

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Frequency of Wet Season Inundation/Saturation from Sample Years

DRY SEASON FAIRY SHRIMP SURVEY FOR THE TORRANCE REGIONAL TRANSIT CENTER PROJECT

HELIX Environmental Planning

N 0 120 Feet

Figure 4

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Plot Locations

DRY SEASON FAIRY SHRIMP SURVEY FOR THE TORRANCE REGIONAL TRANSIT CENTER PROJECT

HELIX Environmental Planning

N 0 120 Feet

Figure 5

3.0 METHODS

HELIX permitted biologist Jason Kurnow (Permit TE778195) conducted the dry season sampling according to USFWS protocol (USFWS 1996) on August 22, 2014. Sampling was conducted within depression areas in the northern portion of the site that had evidence of inundation/saturation at least one of six years (HELIX 2014 [Figure 4]), as well as an excavated pit located in the southern portion of the site. Fourteen sample plots were established within the depression areas, with one sample plot located in the excavated pit (Figure 5). A majority of the plots within the depression areas occurred where there was evidence of inundation/saturation at least three of six years (HELIX 2014 [Figure 4]). Slight variations in microtopography within these locations created shallow depressions, which defined the boundaries of these plots. The majority of the depressions were located in the central, lowest-lying areas in the northern portion of the site. To ensure complete coverage of areas potentially subject to inundation/saturation within the project site, additional plots were established in areas showing evidence of inundation/saturation one of six years. These areas did not have any distinct depressions, so sampling in these areas consisted of 25-foot squared (ft^2) plots (Figure 5). This sampling area was determined by Mr. Kurnow to be large enough to represent the general area associated with the individual plot. Representative photos of the area are included with this report (Appendix A). Approximate depth, area, and habitat condition of each sampled basin was noted and recorded on a USFWS Vernal Pool Data Sheet (Appendix B).

Following soil collection, the samples were brought to the HELIX lab for analysis by Mr. Kurnow. Samples were prepared by dissolving the soil samples in water and sequentially sieving the material through 710-, 355-, and 212-µm pore size screens. The small size of these screens ensures that cysts from the target fairy shrimp species are retained. The portion of each sample retained in the screen was dispersed in a brine solution to separate the organic from the inorganic material. The organic fraction was decanted, dried, and examined under a microscope. Cysts were identified to genus level based on surface characteristics. Multiple species of the *Branchinecta* genus can occur in Los Angeles County, but cannot be identified beyond genus level based on cyst characteristics alone.

To supplement the dry season sampling, a hatching effort was conducted to provide adult specimens that could be identified to species level. Upon written approval from the USFWS, additional soil was collected within each of the plots containing *Branchinecta* cysts and sent to D. Christopher Rogers for hatching. Methodologies for hatching are detailed in the hatching report, which is included as Appendix D.

4.0 RESULTS

Fifteen plots, covering 2 distinct areas, were sampled for the presence of fairy shrimp cysts (Figure 5). *Branchinecta* cysts were present in 14 plots (Appendix C). Plots containing *Branchinecta* cysts include: 1-2, and 4-15. No *Streptocephalus* sp. cysts were observed in any of the sampled plots.

Cultures from 12 of the 14 plots containing *Branchinecta* cysts produced large numbers of the non-listed fairy shrimp *Branchinecta lindahli* based on the results of the hatching effort (Appendix D). Fairy shrimp cysts did not hatch in cultures for Plots 1 and 7. No federally threatened or endangered species were cultured from any of the soil samples.

5.0 REFERENCES

California Department of Fish and Wildlife (CDFW). 2014. Rarefind 5. Available at: http://www.dfg.ca.gov/biogeodata/cnddb/mapsanddata.asp. September.

Eriksen, C.H. and D. Belk. 1999. Fairy Shrimps of California's Puddles, Pools, and Playas. Mad River Press. Eurkea, California. 196pp.

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U.S. Fish and Wildlife Service (USFWS). 2008. San Diego Fairy Shrimp 5-year Review. September.

2007. Federal Register / Vol. 72, No. 238 / Wednesday, December 12, 2007 / Rules and Regulations Designation of Critical Habitat for the San Diego Fairy Shrimp (*Branchinecta sandiegonensis*); Final Rule. December.

1996. Interim Survey Guidelines to Permittees for Recovery Permits under Section 10(a)(1)(A) of the Endangered Species Act for the Listed Vernal Pool Brachiopods. April 19.

Appendix A

REPRESENTATIVE PHOTOS

Plot 15 - Looking West - 8/22/14 - JK

Plot 12 - Looking Northwest - 8/22/14 - JK

General View of Sample Area - Looking Southeast - 8/22/14 - JK

Appendix B

USFWS VERNAL POOL DATA SHEETS

U.S. Fish and Wildlife Service Vernal Pool Data Sheet Dry Season Survey
Note: Please fill out the required information completely for each site visit.

This form is being submitted to serve as part of the 90-day report: _____ no __X__ yes

Required color slides and/or photographs for the project site are included: _____ no __X__ yes

Date: 8 / 22 / 14 Time: 0700-0900 County: Los Angeles Quad: Torrance

Collector(s): Jason Kuroow Permit #: TE 778195

Site/Project Name: Torrance Regional Transit Center ~~Pool~~ Plot #: 1

Township: 4 South Range: 14 West Section: unsectioned land 33° 50'32"N lat. _____ long. 118° 19'47"W

Habitat Condition: (circle where appropriate)

- undisturbed (disturbed:) tire tracks garbage discing/plowing
- (ungrazed) grazed: cattle horses sheep other_____
  light moderate heavy
- land use of habitat: abandoned lot located in an industrial area

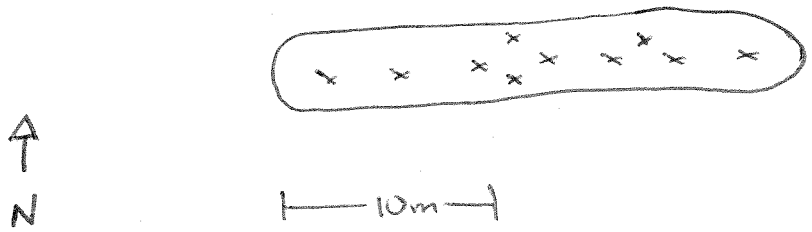
Pool Bottom Surface: (circle where appropriate)

(hardpan) claypan cobbly/rocky lava flow other_____

Pool Depth: 50 cm (estimated maximum) Surface Area: 208 m2 (estimated maximum)

Sketch of pool and transects showing:

- scale
- indication of North
- sampling locations



U.S Fish and Wildlife Service Vernal Pool Data Sheet
Dry Season Survey
Soil Analysis

Note: Please fill out the required information completely for each site visit.

Sample ID	Sample Volume(ml)	Genus (/species)	# Cysts (or None)	Cyst Density (#/100ml)
1	100	Branchinecta sp.	2	2
2		Branchinecta sp.	1	1
3		NA	None	NA
4		Branchinecta sp.	1	1
5		NA	None	NA
6		NA	None	NA
7		NA	None	NA
8		NA	None	NA
9		NA	None	NA
10		Branchinecta sp.	1	1

Voucher Specimens

Cysts shall be stored dry and shall be preserved according to the standards of the institution in which they will be accessioned.

Genus (/species)	# Cysts	Catalog/Accession #	Pool #

U.S. Fish and Wildlife Service Vernal Pool Data Sheet Dry Season Survey
Note: Please fill out the required information completely for each site visit.

This form is being submitted to serve as part of the 90-day report: _____ no __X__ yes

Required color slides and/or photographs for the project site are included: _____ no __X__ yes

Date: 8 / 22 / 14 Time: 0400-0900 County: Los Angeles Quad: Torrance

Collector(s): Jason Kumow Permit #: TE 778195

Site/Project Name: Torrance Regional Transit Center ~~Pool~~ Plot #: 2

Township: 4 South Range: 14 West Section: unsectioned land 33°50'34"N lat. 118°19'46"W long.

Habitat Condition: (circle where appropriate)

- undisturbed (disturbed:) tire tracks garbage discing/plowing
- (ungrazed) grazed: cattle horses sheep other_____
  light moderate heavy
- land use of habitat: abandoned lot located in an industrial area

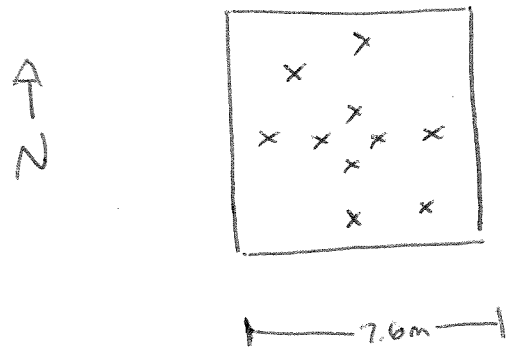
Pool Bottom Surface: (circle where appropriate)

(hardpan) claypan cobbly/rocky lava flow other_____

Pool Depth: 8 cm (estimated maximum) Surface Area: 58 m2 (estimated maximum)

Sketch of pool and transects showing:

- scale
- indication of North
- sampling locations



U.S Fish and Wildlife Service Vernal Pool Data Sheet
Dry Season Survey
Soil Analysis

Note: Please fill out the required information completely for each site visit.

Sample ID	Sample Volume(ml)	Genus (/species)	# Cysts (or None)	Cyst Density (#/100ml)
1	100	Branchinecta	45	45
2			28	28
3			7	7
4			5	5
5			19	19
6			5	5
7			2	2
8			8	8
9			6	6
10			17	17

Voucher Specimens

Cysts shall be stored dry and shall be preserved according to the standards of the institution in which they will be accessioned.

Genus (/species)	# Cysts	Catalog/Accession #	Pool #

U.S. Fish and Wildlife Service Vernal Pool Data Sheet Dry Season Survey
Note: Please fill out the required information completely for each site visit.

This form is being submitted to serve as part of the 90-day report: _____ no __X__ yes

Required color slides and/or photographs for the project site are included: _____ no __X__ yes

Date: 8 / 22 / 14 Time: 0700-0900 County: Los Angeles Quad: Torrance

Collector(s): Jason Kuroda Permit #: TE 778195

Site/Project Name: Torrance Regional Transit Center ~~Pool~~ Plot #: 3

Township: 4 South Range: 14 West Section: unsectioned land 33°50'36"N lat. A long. 118°19'46"W

Habitat Condition: (circle where appropriate)

- undisturbed (disturbed:) tire tracks garbage discing/plowing
- (ungrazed) grazed: cattle horses sheep other_____
  light moderate heavy
- land use of habitat: abandoned lot located in an industrial area

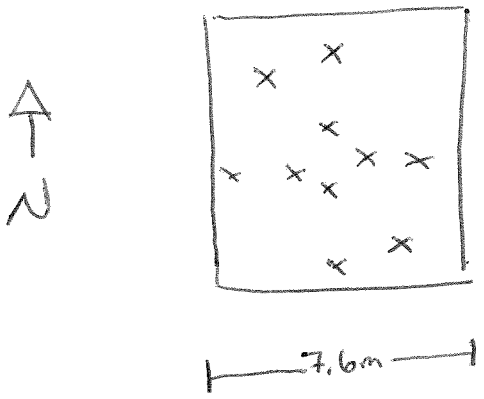
Pool Bottom Surface: (circle where appropriate)

(hardpan) claypan cobbly/rocky lava flow other_____

Pool Depth: 8 cm (estimated maximum) Surface Area: 58 m2 (estimated maximum)

Sketch of pool and transects showing:

- scale
- indication of North
- sampling locations



U.S Fish and Wildlife Service Vernal Pool Data Sheet
Dry Season Survey
Soil Analysis

Note: Please fill out the required information completely for each site visit.

Sample ID	Sample Volume(ml)	Genus (/species)	# Cysts (or None)	Cyst Density (#/100ml)
1	100	NA	None	NA
2				
3				
4				
5				
6				
7				
8				
9				
10				

Voucher Specimens

Cysts shall be stored dry and shall be preserved according to the standards of the institution in which they will be accessioned.

Genus (/species)	# Cysts	Catalog/Accession #	Pool #

U.S. Fish and Wildlife Service Vernal Pool Data Sheet Dry Season Survey
Note: Please fill out the required information completely for each site visit.

This form is being submitted to serve as part of the 90-day report: _____ no __X__ yes

Required color slides and/or photographs for the project site are included: _____ no __X__ yes

Date: 8 / 22 / 14 Time: 0700-0900 County: Los Angeles Quad: Torrance

Collector(s): Jason Knemow Permit #: TE 778195

Site/Project Name: Torrance Regional Transit Center ~~Pool~~ Plot #: 4

Township: 4 South Range: 14 West Section: unsectioned land 33°50'36"N lat. _____ long. 118°19'46"W

Habitat Condition: (circle where appropriate)

- undisturbed (disturbed:) tire tracks garbage discing/plowing
- (ungrazed) grazed: cattle horses sheep other_____
light moderate heavy

- land use of habitat: abandoned lot located in an industrial area

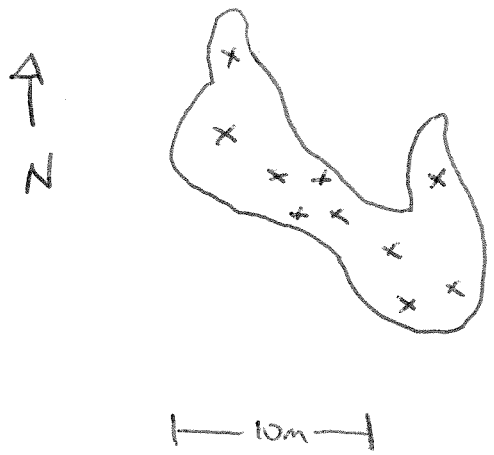
Pool Bottom Surface: (circle where appropriate)

(hardpan) claypan cobbly/rocky lava flow other_____

Pool Depth: 20 cm (estimated maximum) Surface Area: 123 m2 (estimated maximum)

Sketch of pool and transects showing:

- scale
- indication of North
- sampling locations



U.S Fish and Wildlife Service Vernal Pool Data Sheet
Dry Season Survey
Soil Analysis

Note: Please fill out the required information completely for each site visit.

Sample ID	Sample Volume(ml)	Genus (/species)	# Cysts (or None)	Cyst Density (#/100ml)
1	100	NA	None	NA
2		NA	None	NA
3		Branchinecta	1	1
4		NA	None	NA
5		Branchinecta	1	1
6		NA	None	NA
7		Branchinecta	1	1
8		NA	None	NA
9		NA	None	NA
10		NA	None	NA

Voucher Specimens

Cysts shall be stored dry and shall be preserved according to the standards of the institution in which they will be accessioned.

Genus (/species)	# Cysts	Catalog/Accession #	Pool #

U.S. Fish and Wildlife Service Vernal Pool Data Sheet Dry Season Survey
Note: Please fill out the required information completely for each site visit.

This form is being submitted to serve as part of the 90-day report: _____ no __X__ yes

Required color slides and/or photographs for the project site are included: _____ no __X__ yes

Date: 8 / 22 / 14 Time: 0700-0900 County: Los Angeles Quad: Torrance

Collector(s): Jason Kumrow Permit #: TE 778195

Site/Project Name: Torrance Regional Transit Center ~~Pool~~ Plot #: 5

Township: 4 South Range: 14 West Section: unsectioned land 33°50'37"N lat. _____ long. 118°19'49W

Habitat Condition: (circle where appropriate)

- undisturbed	(disturbed)	tire tracks	garbage	discing/plowing	
- (ungrazed)	grazed:	cattle	horses	sheep	other_____
			light	moderate	heavy

- land use of habitat: abandoned lot located in an industrial area

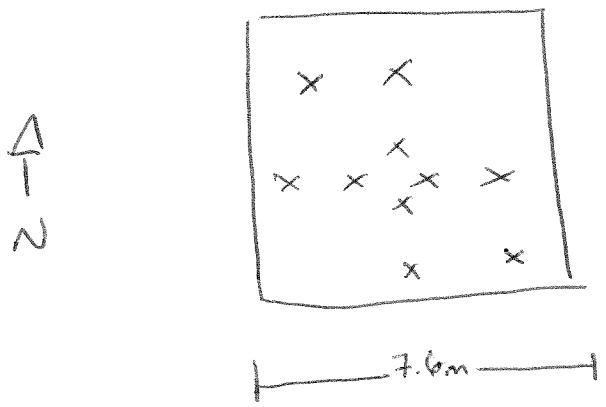
Pool Bottom Surface: (circle where appropriate)

(hardpan) claypan cobbly/rocky lava flow other_____

Pool Depth: 8 cm (estimated maximum) Surface Area: 58 m2 (estimated maximum)

Sketch of pool and transects showing:

- scale
- indication of North
- sampling locations



U.S Fish and Wildlife Service Vernal Pool Data Sheet
Dry Season Survey
Soil Analysis

Note: Please fill out the required information completely for each site visit.

Sample ID	Sample Volume(ml)	Genus (/species)	# Cysts (or None)	Cyst Density (#/100ml)
1	100	Branchinecta	23	23
2			14	14
3			28	28
4			10	10
5			12	12
6			17	17
7			23	23
8			13	13
9			18	18
10			16	16

Voucher Specimens

Cysts shall be stored dry and shall be preserved according to the standards of the institution in which they will be accessioned.

Genus (/species)	# Cysts	Catalog/Accession #	Pool #

U.S. Fish and Wildlife Service Vernal Pool Data Sheet Dry Season Survey
Note: Please fill out the required information completely for each site visit.

This form is being submitted to serve as part of the 90-day report: _____ no __X__ yes

Required color slides and/or photographs for the project site are included: _____ no __X__ yes

Date: 8 / 22 / 14 Time: 0700-0900 County: Los Angeles Quad: Torrance

Collector(s): Jason Kumow Permit #: TE 778195

Site/Project Name: Torrance Regional Transit Center ~~Pool~~ Plot #: 6

Township: 4 South Range: 14 West Section: unsectioned land 33°50'36"N lat. A long. 118° 19' 49"W

Habitat Condition: (circle where appropriate)

- undisturbed	(disturbed):	tire tracks	garbage	discing/plowing	
- (ungrazed)	grazed:	cattle	horses	sheep	other_____
			light	moderate	heavy

- land use of habitat: abandoned lot located in an industrial area

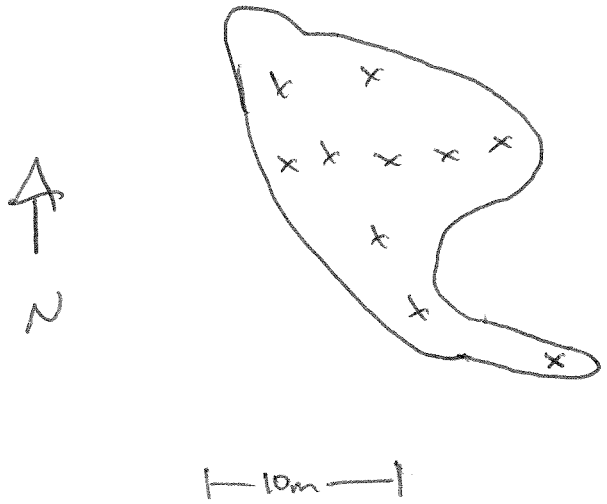
Pool Bottom Surface: (circle where appropriate)

(hardpan) claypan cobbly/rocky lava flow other_____

Pool Depth: 22 cm (estimated maximum) Surface Area: 94 m2 (estimated maximum)

Sketch of pool and transects showing:

- scale
- indication of North
- sampling locations



U.S Fish and Wildlife Service Vernal Pool Data Sheet
Dry Season Survey
Soil Analysis

Note: Please fill out the required information completely for each site visit.

Sample ID	Sample Volume(ml)	Genus (/species)	# Cysts (or None)	Cyst Density (#/100ml)
1	100	Branchinecta	35	35
2			27	27
3			23	23
4			58	57
5			32	32
6			30	30
7			9	9
8			64	64
9			25	25
10			8	8

Voucher Specimens

Cysts shall be stored dry and shall be preserved according to the standards of the institution in which they will be accessioned.

Genus (/species)	# Cysts	Catalog/Accession #	Pool #

U.S. Fish and Wildlife Service Vernal Pool Data Sheet Dry Season Survey
Note: Please fill out the required information completely for each site visit.

This form is being submitted to serve as part of the 90-day report: _____ no __X__ yes

Required color slides and/or photographs for the project site are included: _____ no __X__ yes

Date: 8 / 22 / 14 Time: 0700-0900 County: Los Angeles Quad: Torrance

Collector(s): Jason Kurrow Permit #: TE 778195

Site/Project Name: Torrance Regional Transit Center ~~Pool~~ Plot #: 7

Township: 4 South Range: 14 West Section: unsectioned land 33°50'35"N lat. n/a long. 118°19'49"W

Habitat Condition: (circle where appropriate)

- undisturbed (disturbed:) tire tracks garbage discing/plowing
- (ungrazed) grazed: cattle horses sheep other_____
  light moderate heavy
- land use of habitat: abandoned lot located in an industrial area

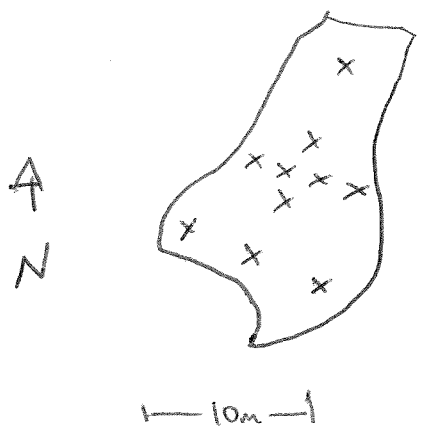
Pool Bottom Surface: (circle where appropriate)

(hardpan) claypan cobbly/rocky lava flow other_____

Pool Depth: 19 cm (estimated maximum) Surface Area: 122 m2 (estimated maximum)

Sketch of pool and transects showing:

- scale
- indication of North
- sampling locations



U.S Fish and Wildlife Service Vernal Pool Data Sheet
Dry Season Survey
Soil Analysis

Note: Please fill out the required information completely for each site visit.

Sample ID	Sample Volume(ml)	Genus (/species)	# Cysts (or None)	Cyst Density (#/100ml)
1	100	Branchinecta	2	2
2			15	15
3			8	8
4			12	12
5			2	2
6			7	7
7			8	8
8			12	12
9			8	8
10			7	7

Voucher Specimens

Cysts shall be stored dry and shall be preserved according to the standards of the institution in which they will be accessioned.

Genus (/species)	# Cysts	Catalog/Accession #	Pool #

U.S. Fish and Wildlife Service Vernal Pool Data Sheet Dry Season Survey
Note: Please fill out the required information completely for each site visit.

This form is being submitted to serve as part of the 90-day report: _____ no __X__ yes

Required color slides and/or photographs for the project site are included: _____ no __X__ yes

Date: 8 / 22 / 14 Time: 0700-0900 County: Los Angeles Quad: Torrance

Collector(s): Jason Kuenow Permit #: TE 778195

Site/Project Name: Torrance Regional Transit Center ~~Pool~~ Plot #: 8

Township: 4 South Range: 14 West Section: unsectioned land 33°50'35"N lat. _____ long. 118° 19' 49" W

Habitat Condition: (circle where appropriate)

- undisturbed	(disturbed):	tire tracks	garbage	discing/plowing	
- (ungrazed)	grazed:	cattle	horses	sheep	other_____
			light	moderate	heavy

- land use of habitat: abandoned lot located in an industrial area

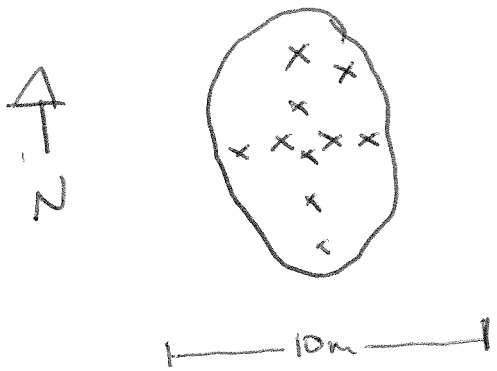
Pool Bottom Surface: (circle where appropriate)

(hardpan) claypan cobbly/rocky lava flow other_____

Pool Depth: 35 cm (estimated maximum) Surface Area: 64 m2 (estimated maximum)

Sketch of pool and transects showing:

- scale
- indication of North
- sampling locations



U.S Fish and Wildlife Service Vernal Pool Data Sheet
Dry Season Survey
Soil Analysis

Note: Please fill out the required information completely for each site visit.

Sample ID	Sample Volume(ml)	Genus (/species)	# Cysts (or None)	Cyst Density (#/100ml)
1	100	Branchinecta	28	28
2			23	23
3			41	41
4			43	43
5			50	50
6			17	17
7			32	32
8			14	14
9			35	35
10			20	20

Voucher Specimens

Cysts shall be stored dry and shall be preserved according to the standards of the institution in which they will be accessioned.

Genus (/species)	# Cysts	Catalog/Accession #	Pool #

U.S. Fish and Wildlife Service Vernal Pool Data Sheet Dry Season Survey
Note: Please fill out the required information completely for each site visit.

This form is being submitted to serve as part of the 90-day report: _____ no __X__ yes

Required color slides and/or photographs for the project site are included: _____ no __X__ yes

Date: 8 / 22 / 14 Time: 0700-0900 County: Los Angeles Quad: Torrance

Collector(s): Jason Kumow Permit #: TE 778195

Site/Project Name: Torrance Regional Transit Center ~~Pool~~ Plot #: 9

Township: 4 South Range: 14 West Section: unsectioned land 33°50' 34"N lat. _____ long. 118° 19' 49"W

Habitat Condition: (circle where appropriate)

- undisturbed (disturbed:) tire tracks garbage discing/plowing
- (ungrazed) grazed: cattle horses sheep other_____
light moderate heavy

- land use of habitat: abandoned lot located in an industrial area

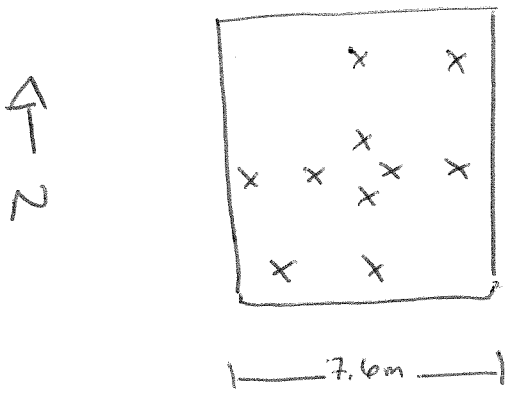
Pool Bottom Surface: (circle where appropriate)

(hardpan) claypan cobbly/rocky lava flow other_____

Pool Depth: 8 cm (estimated maximum) Surface Area: 58 m2 (estimated maximum)

Sketch of pool and transects showing:

- scale
- indication of North
- sampling locations



U.S Fish and Wildlife Service Vernal Pool Data Sheet
Dry Season Survey
Soil Analysis

Note: Please fill out the required information completely for each site visit.

Sample ID	Sample Volume(ml)	Genus (/species)	# Cysts (or None)	Cyst Density (#/100ml)
1	100	Branchinecta	1	1
2	↓	Branchinecta	5	5
3		Branchinecta	2	2
4		Branchinecta	3	3
5		Branchinecta	1	1
6		NA	None	NA
7		NA	None	NA
8		Branchinecta	4	4
9		Branchinecta	2	2
10		Branchinecta	8	8

Voucher Specimens

Cysts shall be stored dry and shall be preserved according to the standards of the institution in which they will be accessioned.

Genus (/species)	# Cysts	Catalog/Accession #	Pool #

U.S. Fish and Wildlife Service Vernal Pool Data Sheet Dry Season Survey
Note: Please fill out the required information completely for each site visit.

This form is being submitted to serve as part of the 90-day report: _____ no __X__ yes

Required color slides and/or photographs for the project site are included: _____ no __X__ yes

Date: 8 / 22 / 14 Time: 0700-0900 County: Los Angeles Quad: Torrance

Collector(s): Jason Kumow Permit #: TE 778195

Site/Project Name: Torrance Regional Transit Center ~~Pool~~ Plot #: 10

Township: 4 South Range: 14 West Section: unsectioned land 33°50'36" N lat. _____ long. 118°19'50" W

Habitat Condition: (circle where appropriate)

- undisturbed (disturbed:) tire tracks garbage discing/plowing
- (ungrazed) grazed: cattle horses sheep other_____
light moderate heavy

- land use of habitat: abandoned lot located in an industrial area

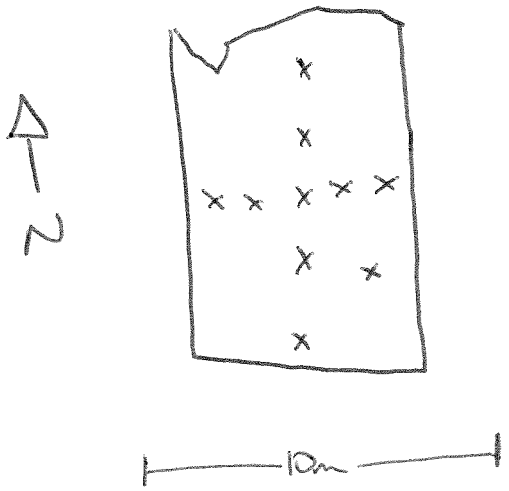
Pool Bottom Surface: (circle where appropriate)

(hardpan) claypan cobbly/rocky lava flow other_____

Pool Depth: _____cm (estimated maximum) Surface Area: 86 m2 (estimated maximum)

Sketch of pool and transects showing:

- scale
- indication of North
- sampling locations



U.S Fish and Wildlife Service Vernal Pool Data Sheet
Dry Season Survey
Soil Analysis

Note: Please fill out the required information completely for each site visit.

Sample ID	Sample Volume(ml)	Genus (/species)	# Cysts (or None)	Cyst Density (#/100ml)
1	100	Branchinecta	9	9
2			14	14
3			4	4
4			7	7
5			4	4
6			3	3
7			4	4
8			5	5
9			7	7
10			8	8

Voucher Specimens

Cysts shall be stored dry and shall be preserved according to the standards of the institution in which they will be accessioned.

Genus (/species)	# Cysts	Catalog/Accession #	Pool #

U.S. Fish and Wildlife Service Vernal Pool Data Sheet Dry Season Survey
Note: Please fill out the required information completely for each site visit.

This form is being submitted to serve as part of the 90-day report: _____ no __X__ yes

Required color slides and/or photographs for the project site are included: _____ no __X__ yes

Date: 8 / 22 / 14 Time: 0700-0900 County: Los Angeles Quad: Torrance

Collector(s): Jason Kumow Permit #: TE 778195

Site/Project Name: Torrance Regional Transit Center ~~Pool~~ Plot #: 11

Township: 4 South Range: 14 West Section: unsectioned land 33°50'36"N lat. _____ long. 118°19'50"W

Habitat Condition: (circle where appropriate)

- undisturbed (disturbed:) tire tracks garbage discing/plowing
- (ungrazed) grazed: cattle horses sheep other_____
light moderate heavy

- land use of habitat: abandoned lot located in an industrial area

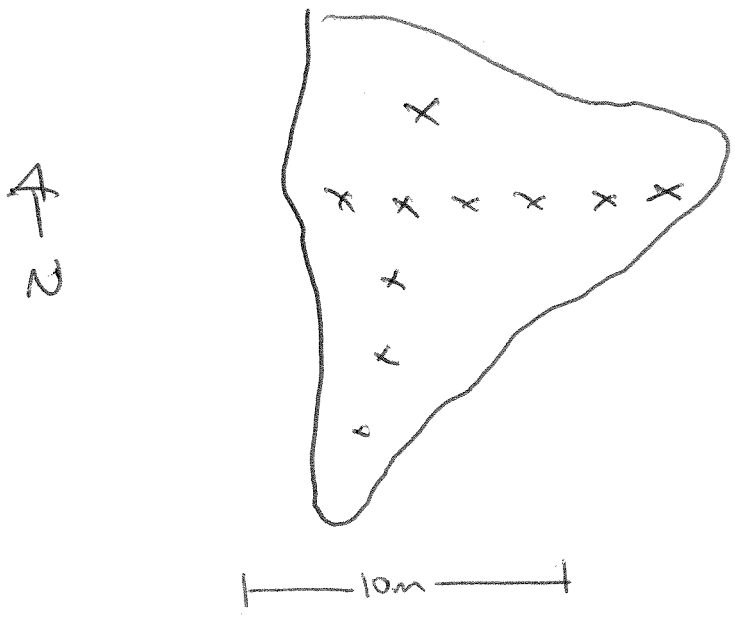
Pool Bottom Surface: (circle where appropriate)

(hardpan) claypan cobbly/rocky lava flow other_____

Pool Depth: 20 cm (estimated maximum) Surface Area: 229 m2 (estimated maximum)

Sketch of pool and transects showing:

- scale
- indication of North
- sampling locations



U.S Fish and Wildlife Service Vernal Pool Data Sheet
Dry Season Survey
Soil Analysis

Note: Please fill out the required information completely for each site visit.

Sample ID	Sample Volume(ml)	Genus (/species)	# Cysts (or None)	Cyst Density (#/100ml)
1	100	Branchinecta	16	16
2	↓	↓	11	11
3	↓	↓	7	7
4	↓	↓	11	11
5	↓	↓	15	15
6	↓	↓	14	14
7	↓	↓	8	8
8	↓	↓	10	10
9	↓	↓	13	13
10	↓	↓	17	17

Voucher Specimens

Cysts shall be stored dry and shall be preserved according to the standards of the institution in which they will be accessioned.

Genus (/species)	# Cysts	Catalog/Accession #	Pool #

U.S. Fish and Wildlife Service Vernal Pool Data Sheet Dry Season Survey
Note: Please fill out the required information completely for each site visit.

This form is being submitted to serve as part of the 90-day report: _____ no __X__ yes

Required color slides and/or photographs for the project site are included: _____ no __X__ yes

Date: 8 / 22 / 14 Time: 0700-0900 County: Los Angeles Quad: Torrance

Collector(s): Jason Kurrow Permit #: TE 778195

Site/Project Name: Torrance Regional Transit Center ~~Pool~~ Plot #: 12

Township: 4 South Range: 14 West Section: unsectioned land 33°50'36" N lat. _____ long. 118°19'50" W

Habitat Condition: (circle where appropriate)

- undisturbed (disturbed:) tire tracks garbage discing/plowing
- (ungrazed) grazed: cattle horses sheep other_____
  light moderate heavy
- land use of habitat: abandoned lot located in an industrial area

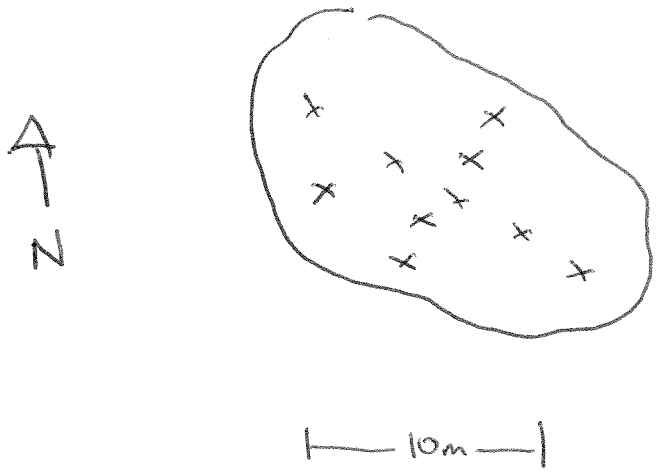
Pool Bottom Surface: (circle where appropriate)

(hardpan) claypan cobbly/rocky lava flow other_____

Pool Depth: 21 cm (estimated maximum) Surface Area: 114 m2 (estimated maximum)

Sketch of pool and transects showing:

- scale
- indication of North
- sampling locations



U.S Fish and Wildlife Service Vernal Pool Data Sheet
Dry Season Survey
Soil Analysis

Note: Please fill out the required information completely for each site visit.

Sample ID	Sample Volume(ml)	Genus (/species)	# Cysts (or None)	Cyst Density (#/100ml)
1	100	Branchinecta	24	24
2			32	32
3			17	17
4			25	25
5			18	18
6			26	26
7			9	9
8			18	18
9			26	26
10			19	19

Voucher Specimens

Cysts shall be stored dry and shall be preserved according to the standards of the institution in which they will be accessioned.

Genus (/species)	# Cysts	Catalog/Accession #	Pool #

U.S. Fish and Wildlife Service Vernal Pool Data Sheet Dry Season Survey
Note: Please fill out the required information completely for each site visit.

This form is being submitted to serve as part of the 90-day report: _____ no __X__ yes

Required color slides and/or photographs for the project site are included: _____ no __X__ yes

Date: 8 / 22 / 14 Time: 0700-0900 County: Los Angeles Quad: Torrance

Collector(s): Jason Kuenow Permit #: TE 778195

Site/Project Name: Torrance Regional Transit Center ~~Pool~~ Plot #: 13

Township: 4 South Range: 14 West Section: unsectioned land 33°50'36"N lat. 118°19'57"W long.

Habitat Condition: (circle where appropriate)

- undisturbed	(disturbed):	tire tracks	garbage	discing/plowing	
- (ungrazed)	grazed:	cattle	horses	sheep	other_____
			light	moderate	heavy

- land use of habitat: abandoned lot located in an industrial area

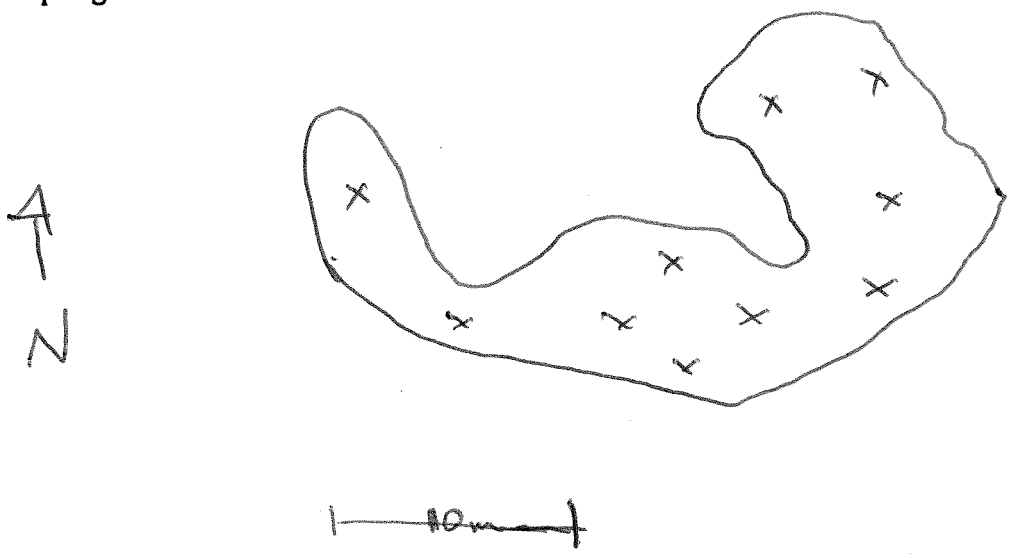
Pool Bottom Surface: (circle where appropriate)

(hardpan) claypan cobbly/rocky lava flow other_____

Pool Depth: 16 cm (estimated maximum) Surface Area: 290 m2 (estimated maximum)

Sketch of pool and transects showing:

- scale
- indication of North
- sampling locations



U.S Fish and Wildlife Service Vernal Pool Data Sheet
Dry Season Survey
Soil Analysis

Note: Please fill out the required information completely for each site visit.

Sample ID	Sample Volume(ml)	Genus (/species)	# Cysts (or None)	Cyst Density (#/100ml)
1	100	Branchinecta	12	12
2			10	10
3			22	22
4			17	17
5			18	18
6			17	17
7			10	10
8			8	8
9			16	16
10			12	12

Voucher Specimens

Cysts shall be stored dry and shall be preserved according to the standards of the institution in which they will be accessioned.

Genus (/species)	# Cysts	Catalog/Accession #	Pool #

U.S. Fish and Wildlife Service Vernal Pool Data Sheet Dry Season Survey
Note: Please fill out the required information completely for each site visit.

This form is being submitted to serve as part of the 90-day report: _____ no __X__ yes

Required color slides and/or photographs for the project site are included: _____ no __X__ yes

Date: 8 / 22 / 14 Time: 0700-0900 County: Los Angeles Quad: Torrance

Collector(s): Jason Kuroda Permit #: TE 778195

Site/Project Name: Torrance Regional Transit Center ~~Pool~~ Plot #: 14

Township: 4 South Range: 14 West Section: unsectioned land 33°50'37" lat. — long. 118°19'54" W

Habitat Condition: (circle where appropriate)

- undisturbed (disturbed:) tire tracks garbage discing/plowing
- (ungrazed) grazed: cattle horses sheep other_____
  light moderate heavy
- land use of habitat: abandoned lot located in an industrial area

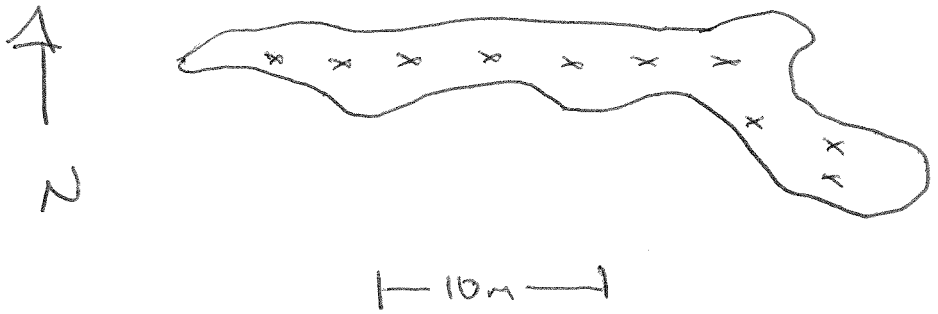
Pool Bottom Surface: (circle where appropriate)

(hardpan) claypan cobbly/rocky lava flow other_____

Pool Depth: 18 cm (estimated maximum) Surface Area: 198 m2 (estimated maximum)

Sketch of pool and transects showing:

- scale
- indication of North
- sampling locations



U.S Fish and Wildlife Service Vernal Pool Data Sheet
Dry Season Survey
Soil Analysis

Note: Please fill out the required information completely for each site visit.

Sample ID	Sample Volume(ml)	Genus (/species)	# Cysts (or None)	Cyst Density (#/100ml)
1	100	Branchinecta	35	35
2			32	32
3			71	71
4			72	72
5			50	50
6			41	41
7			104	104
8			35	35
9			100	100
10			43	43

Voucher Specimens

Cysts shall be stored dry and shall be preserved according to the standards of the institution in which they will be accessioned.

Genus (/species)	# Cysts	Catalog/Accession #	Pool #

U.S. Fish and Wildlife Service Vernal Pool Data Sheet Dry Season Survey
Note: Please fill out the required information completely for each site visit.

This form is being submitted to serve as part of the 90-day report: _____ no __X__ yes

Required color slides and/or photographs for the project site are included: _____ no __X__ yes

Date: 8 / 22 / 14 Time: 0700-0900 County: Los Angeles Quad: Torrance

Collector(s): Jason Kumow Permit #: TE 778195

Site/Project Name: Torrance Regional Transit Center ~~Pool~~ Plot #: 15

Township: 4 South Range: 14 West Section: unsectioned land 33°50'37"N lat. _____ long. 118°19'53"W

Habitat Condition: (circle where appropriate)

- undisturbed (disturbed) tire tracks garbage discing/plowing
- (ungrazed) grazed: cattle horses sheep other_____
  light moderate heavy

- land use of habitat: abandoned lot located in an industrial area

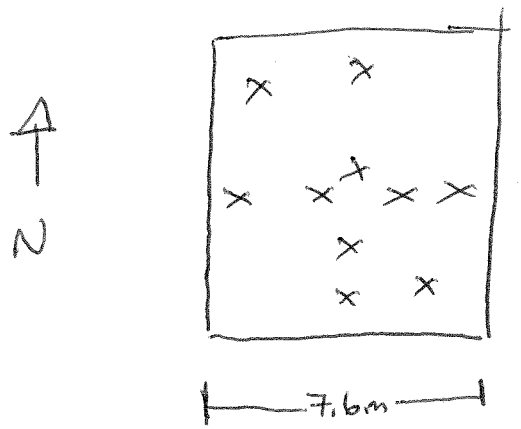
Pool Bottom Surface: (circle where appropriate)

(hardpan) claypan cobbly/rocky lava flow other_____

Pool Depth: 8 cm (estimated maximum) Surface Area: 58 m2 (estimated maximum)

Sketch of pool and transects showing:

- scale
- indication of North
- sampling locations



U.S Fish and Wildlife Service Vernal Pool Data Sheet
Dry Season Survey
Soil Analysis

Note: Please fill out the required information completely for each site visit.

Sample ID	Sample Volume(ml)	Genus (/species)	# Cysts (or None)	Cyst Density (#/100ml)
1	100	Branchinecta	1	1
2		Branchinecta	1	1
3		Branchinecta	1	1
4		NA	None	NA
5		NA	None	NA
6		Branchinecta	1	1
7		Branchinecta	1	1
8		NA	None	NA
9		NA	None	NA
10		NA	None	NA

Voucher Specimens

Cysts shall be stored dry and shall be preserved according to the standards of the institution in which they will be accessioned.

Genus (/species)	# Cysts	Catalog/Accession #	Pool #

Appendix C

DRY SEASON FAIRY SHRIMP SAMPLING RESULTS

Appendix C
DRY SEASON FAIRY SHRIMP SAMPLING RESULTS

***BRANCHINECTA* DRY SEASON FAIRY SHRIMP SAMPLING RESULTS TORRANCE REGIONAL TRANSIT CENTER**															
Sample	*Branchinecta*														
	Plot 1	Plot 2	Plot 3	Plot 4	Plot 5	Plot 6	Plot 7	Plot 8	Plot 9	Plot 10	Plot 11	Plot 12	Plot 13	Plot 14	Plot 15
1	2	45	---	---	23	35	2	28	1	9	16	24	12	35	1
2	1	28	---	---	14	27	15	23	5	14	11	32	10	32	1
3	---	7	---	1	28	23	8	41	2	4	7	17	22	71	1
4	1	5	---	---	10	57	12	43	3	7	11	25	17	72	---
5	---	19	---	1	12	32	22	50	1	4	15	18	18	50	---
6	---	5	---	---	17	30	7	17	---	3	14	26	17	41	1
7	---	2	---	1	23	9	8	32	---	4	8	9	10	104	1
8	---	8	---	---	13	64	12	14	4	5	10	18	8	35	---
9	---	6	---	---	18	25	8	35	2	7	13	26	16	100	---
10	1	17	---	---	16	8	7	20	8	8	17	19	12	43	---

Appendix C (cont.)
DRY SEASON FAIRY SHRIMP SAMPLING RESULTS

***STREPTOCEPHALUS* DRY SEASON FAIRY SHRIMP SAMPLING RESULTS TORRANCE REGIONAL TRANSIT CENTER**															
Sample	*Streptocephalus*														
	Plot 1	Plot 2	Plot 3	Plot 4	Plot 5	Plot 6	Plot 7	Plot 8	Plot 9	Plot 10	Plot 11	Plot 12	Plot 13	Plot 14	Plot 15
1	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
2	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
3	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
4	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
5	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
6	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
7	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
8	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
9	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
10	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

Appendix D

CULTURE RESULTS OF SOIL SAMPLES COLLECTED FROM THE PROPOSED TORRANCE REGIONAL TRANSIT CENTER PROJECT SURVEY AREA, LOS ANGELES COUNTY, CALIFORNIA

The University of Kansas

Kansas Biological Survey

3 October 2014

Jason Kurnow
HELIX Environmental Planning, Inc.
7578 El Cajon Boulevard
Suite 200
La Mesa, CA 91942

SUBJECT: Culture Results of Soil Samples Collected from the proposed Torrance Regional Transit Center Project Survey Area, Los Angeles County, California.

Dear Mr. Kurnow,

HELIX Environmental Planning, Inc. (HELIX) biologists collected soil samples from potential special status shrimp habitats within the proposed Torrance Regional Transit Center Project Survey Area, Los Angeles County, California. Soil samples were collected from 14 previously identified habitats determined to contain anostracan eggs, which were judged to be potentially suitable for special status shrimp species. Cultures from 12 of the 14 soil samples produced large numbers of the nonlisted fairy shrimp *Branchinecta lindahli*. No federally threatened or endangered species were cultured from any of the soil samples.

Kansas Biological Survey understands that HELIX will submit this report and all other pertinent materials and information to the US Fish and Wildlife Service (USFWS), and the California Department of Fish and Wildlife (CDFW), as required by the USFWS guidelines for a protocol level survey.

Definitions

For the purpose of this report, special status shrimp are defined to include shrimp species listed as threatened or endangered under the federal Endangered Species Act (ESA) (50 CFR 17.11 for listed animals and various Federal Register notices for proposed species). Three special status fairy shrimp species (*Branchinecta sandiegonensis* Fugate, 1993, *B. lynchi* Eng, Belk, & Eriksen, 1990 and *Streptocephalus woottoni* Eng, Belk, & Eriksen, 1990) have the potential to occur within the vicinity of the proposed project site. In addition, two nonlisted fairy shrimp species (*Branchinecta lindahli* Packard, 1883 and *Linderiella santarosae* Thiéry & Fugate, 1994) are known from the proposed project vicinity.

Methods

HELIX collected dry soil samples from 14 potential special status shrimp habitats (listed in Table 1.) at the proposed project site in September of 2014. Each soil sample was placed in a plastic zip-lock bag, labeled with the locality number, and submitted to the Kansas Biological Survey laboratory for culture.

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Laboratory Analysis

Soil samples were prepared for examination in the laboratory by dissolving the clumps of soil in distilled water. Adult shrimp were reared from the recovered eggs using methods following U.S. Environmental Protection Agency (1985), Belk, et al. (1990), Maeda-Martinez, et al., (1995a and 1995b), and Jawahar & Dumont (1995). Hatched shrimp were fed a standard *Daphnia* food that includes; fish food, fish oil, baker's yeast, and the alga *Selenastrum capricornutum*. The shrimp were reared to maturity. Adult *Branchinecta* reared from culture were killed in 90% ethyl alcohol, and examined under a stereo dissection microscope. Identifications were made based upon comparisons with specimens in our collections, the original species descriptions and professional experience.

Results

The specific results are presented in Table 1. Of the 14 samples, the nonlisted fairy shrimp *Branchinecta lindahli* was cultured from 12 features.

These analyses are insufficient by themselves to determine that special status shrimp are absent from the habitats on this site. The results of this survey must be combined with a protocol wet season survey, and concurrence must be sought from the USFWS before any additional determinations can be made.

If you have any questions please call me.

Sincerely,

D. Christopher Rogers
785.864.1714
Crustacean Taxonomist and Ecologist
Kansas Biological Survey and The Biodiversity Institute
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Literature Cited

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Table 1. Culture results from 14 features collected from the proposed Torrance Regional Transit Center Project Survey Area, Los Angeles County, California.

Sample Number	***Branchinecta lindahli***
RTL-01 Plot 1	
RTL-01 Plot 2	X
RTL-01 Plot 4	X
RTL-01 Plot 5	X
RTL-01 Plot 6	X
RTL-01 Plot 7	
RTL-01 Plot 8	X
RTL-01 Plot 9	X
RTL-01 Plot 10	X
RTL-01 Plot 11	X
RTL-01 Plot 12	X
RTL-01 Plot 13	X
RTL-01 Plot 14	X

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