APPENDIX B

Existing Conditions Letter Report

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November 7, 2016 SDD-21.24

Ms. Summer Adleberg
City of San Diego
Public Utilities Department
9192 Topaz Way, MS 901A
San Diego, CA 92123

Subject: Existing Conditions Letter Report for the Pure Water San Diego Program North City Water Purifications Project

Dear Ms. Adleberg:

This letter report presents the results of biological surveys conducted by HELIX Environmental Planning, Inc. (HELIX) and subconsultant Rocks Biological Consulting, Inc. (Rocks) for the proposed North City Pure Water Facility Project (project) located in San Diego County, California. The surveys were conducted to assess existing biological conditions and provide the City of San Diego (City) with information necessary to determine project impacts to biological resources.

INTRODUCTION

Project Location

The study area includes six distinct sites located throughout San Diego County: 1) Sander East; 2) Marine Corps Air Station (MCAS) Miramar; 3) Mast Boulevard; 4) Pueblo North; 5) Pueblo Central; and 6) Pueblo South (Figure 1). The three Pueblo sites are located in the City of San Diego, east of Interstate (I-) 805, just west of the MCAS Miramar, and south of Carroll Canyon Road. Pueblo North encompasses a 14.0-acre area, Pueblo Central encompasses a 33-acre area, and Pueblo South encompasses a 29-acre area. Pueblo North is located in unsectioned land within Township 15 South, Range 3 West on the San Bernardino Base and Meridian U.S. Geological Survey (USGS) 7.5-minute Del Mar quadrangle map (Figure 2a). Pueblo Central is located in unsectioned land within Township 15 South, Range 3 West on the San Bernardino Base and Meridian USGS 7.5-minute La Jolla quadrangle map (in part) and the Del Mar

quadrangle map (in part) (Figure 2a). Pueblo South is located in unsectioned land within Township 15 South, Range 3 West on the San Bernardino Base and Meridian USGS 7.5-minute La Jolla quadrangle map (Figure 2a).

Sander East encompasses an approximate 30-acre area located in the community of Kearny Mesa in the City of San Diego, south of State Route 52, and north of Mercury Street. The site is located in unsectioned land within Townships 15 South, Range 3 West on the San Bernardino Base and Meridian USGS 7.5-minute La Jolla quadrangle map (Figure 2b).

Mast Boulevard encompasses an approximate two-acre area located on the border of the City of Santee and an unincorporated part of San Diego County, south of El Nopal, and north of Hillcreek Road. The site is located in unsectioned land within Townships 15 South, Range 1 West on the San Bernardino Base and Meridian USGS 7.5-minute El Cajon quadrangle map (Figure 2c).

MCAS Miramar encompasses an approximate 95-acre area located on MCAS Miramar, east of I-805. The site is located in unsectioned land within Township 15 South, Range 3 West on the San Bernardino Base and Meridian USGS 7.5-minute La Jolla quadrangle map (Figure 2d).

Pueblo North, Pueblo Central, Pueblo South, and Sander East occur within the City's Multiple Species Conservation Program (MSCP) Subarea Plan (City 1997); however, Pueblo Central is the only site located within the Multi-Habitat Planning Area (MHPA; Figure 3). All six sites are located outside of the Coastal Overlay Zone.

Environmental Setting

The six sites are located throughout San Diego County and have unique environmental settings. Elevations in the MCAS Miramar site range from approximately 246 feet (ft) above mean sea level (amsl) to approximately 478 ft amsl. Soil types mapped within this study area include Redding gravelly loam (2 to 9 percent slopes), riverwash, terrace escarpments, Chesterton fine sandy loam (2 to 5 percent slopes), Olivenhain cobbly loam (9 to 30 percent slopes), and Carlsbad gravelly loamy sand (2 to 5 percent slopes). Elevations in the three Pueblo sites range from approximately 260 ft amsl to approximately 394 ft amsl. Soil types mapped within the Pueblo sites include Altamont clay (15 to 30 percent slopes and 30 to 50 percent slopes), Huerhuero loam (15 to 30 percent slopes, eroded), Redding cobbly loam (9 to 30 percent slopes and 2 to 9 percent slopes), Redding gravelly loam (2 to 9 percent slopes), and Olivenhain cobbly loam (30 to 50 percent slopes). Elevations in the Sander East site range from approximately 362 ft amsl to approximately 412 ft amsl. Soil types mapped within this study area include Redding cobbly loam (9 to 30 percent slopes) and Redding gravelly loam (2 to 9 percent slopes). Elevations in the Mast Boulevard site range from approximately 366 ft amsl to approximately 382 ft amsl. One soil type was mapped within this site: Visalia sandy loam (0 to 2 percent slopes) (Bowman 1973).

Project Description

The Pure Water San Diego Program (Pure Water Program) is the City Public Utilities Department's proposed program to provide a safe, secure, and sustainable local drinking water supply for San Diego. Advanced water purification technology will be used to produce potable water from recycled water. The Pure Water Program consists of the design and construction of new advanced water treatment facilities, wastewater treatment facilities, pump stations, transmission lines, and pipelines. In support of the Pure Water Program, the City is proposing to build a new advanced water treatment facility, referred to as the North City Pure Water Facility (NCPWF). The NCPWF project would include expansion of the existing North City Water Reclamation Plant (North City Plant), construction of a new full-scale advanced water purification facility adjacent to the North City Plant, pipelines, electrical transmission lines, and support facilities such as pump stations.

METHODS

Prior to conducting biological field surveys, HELIX conducted searches of the California Department of Fish and Wildlife (CDFW) California Natural Diversity Database (CNDDB), U.S. Fish and Wildlife Service (USFWS) sensitive species database, California Native Plant Society (CNPS) online database for the Del Mar, La Jolla, and El Cajon USGS topographic quadrangles, and the City's MSCP Subarea Plan for information regarding sensitive species known to occur within the vicinity of the survey area. The biological study area that is part of this existing conditions report includes the six sites surveyed, including the additional survey areas shown in Figures 4a-4f. Pueblo South, Pueblo Central, and Sander East are potential mitigation sites for the project.

General Biological Survey

An initial site assessment of the Pueblo North, Pueblo Central, Pueblo South, Sander East, and Mast sites was conducted on September 24, 2015 by Summer Adleberg (City), Shelby Howard (HELIX), and Jim Rocks (Rocks). An initial site assessment of the MCAS Miramar site was conducted on November 4, 2015 by Ms. Adleberg, Mr. Howard, and Mr. Rocks. The purpose of the initial assessment was to evaluate site conditions and discuss the approach to the site surveys. General biological surveys of all six sites were conducted by HELIX biologist Erica Harris and Rocks biologists Lee Ripma, Brian Lohstroh, Marty Lewis, Shannon Walsh, Jim Rocks, and Brenda Bennett. Surveys took place between October 7, 2015 and September 1, 2016. The surveys consisted of mapping vegetation communities, conducting habitat assessments for sensitive species, documenting the locations of sensitive plant and animal species observed, evaluating potentially jurisdictional habitats/drainages, as well as mapping potential ponding basins. The surveys were conducted on foot, and binoculars were used as necessary. Vegetation communities were mapped in accordance with the City's Biology Guidelines (City 2012).

Plant and animal species observed or otherwise detected during the survey were recorded (Attachments A and B). Animal identifications were made in the field by direct, visual observation, or indirectly by detection of calls, burrows, tracks, or scat. Plant identifications were made in the field or in the lab through comparison with voucher specimens or photographs. However, 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.

Wet Season Fairy Shrimp

Rocks permitted biologists Jim Rocks (TE-063230-4), Melanie Rocks (TE-082908-2), Lee Ripma (TE-221290-3), Marty Lewis (authorized individual TE-221290-3), and Brian Lohstroh (TE-063608-5) conducted the wet season survey according to USFWS protocol (USFWS 2015) to determine the presence/absence of San Diego fairy shrimp (*Branchinecta sandiegonensis*) and Riverside fairy shrimp (*Streptocephalus woottoni*). HELIX biologist Erica Harris assisted with the sampling as a supervised individual. Site visits were conducted between October 7, 2015 and June 14, 2016. Out of a total of 82 mapped basins, 41 were inundated long enough for sampling during the 2015-2016 wet season.

Samples were taken in water-holding basins using fine mesh aquarium nets. When possible, fairy shrimp were identified in the field and immediately returned to their pool of origin. In some instances, fairy shrimp were collected and identified using the key in Eriksen and Belk (1999) with aid of a dissecting scope. The USFWS protocol requires that no more than 20 specimens of each species from each feature, or less than 50 percent of the estimated subpopulation for each feature, be collected (whichever is the lesser amount). Care was taken to ensure that nets were cleaned after each basin was sampled. Basin depth, area, water temperature, air temperature, habitat condition, and species present were noted and recorded on USFWS vernal pool data sheets. A species list was recorded at each basin observed on site. Data sheets were not filled out when a basin was dry during a survey visit. Representative site photos and data sheets are provided in the wet season fairy shrimp survey report (Rocks 2016).

Dry Season Fairy Shrimp

HELIX permitted biologist Jason Kurnow (Permit TE-778195-13), along with HELIX biologist Amy Mattson who served as a supervised individual, collected the dry season soil samples according to USFWS protocol (USFWS 2015) on June 17, 28, and 29, 2016. Representative photos of the sites are included in the dry season fairy shrimp survey report (*in prep*). Approximate depth, area, and habitat condition of each sampled basin were noted and recorded on a USFWS Vernal Pool Data Sheet.

Following soil collection, the samples were brought to the HELIX lab for analysis by Mr. Kurnow. HELIX biologists Summer Schlageter, Hannah Sadowski and Ms. Mattson assisted with the soil processing as supervised individuals. 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 San Diego County, but cannot be identified past genus level based on cyst characteristics.

Soil from the three basins containing *Branchinecta* cysts on Pueblo North and 12 of the 21 basins containing *Branchinecta* cysts on MCAS Miramar (see the Results section below for details) was sent to D. Christopher Rogers (University of Kansas) for hatching, in accordance with the current USFWS protocol. Soil samples were prepared for examination by Mr. Rogers in a laboratory at the University of Kansas by dissolving soil clumps containing resting eggs (also referred to as cysts) in distilled water. Adult shrimp were reared from the recovered cysts using methods following U.S. Environmental Protection Agency (1985), Eng et al. (1990), Maeda-Martinez et al. (1995a and 1995b), and Jawahar and 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 percent ethyl alcohol and examined under a stereo dissection microscope. Identifications were made by Mr. Rogers based upon comparisons with specimens in University of Kansas collections, the original species descriptions, and professional experience.

Rare Plant Surveys

Rare plant surveys were conducted by Rocks biologists Jim Rocks, Brenda Bennett, and Lee Ripma on April 12, 13, and 25, May 4, 11, and 13, August 11, and September 1, 2016. The sites were traversed by foot and inspected for the presence of rare plant species. Opportunistic inspections for rare plants were also performed during other surveys conducted in 2015 and 2016. Rare plants investigated include those that are listed as threatened or endangered by the USFWS or CDFW, designated as Rank 1-4 plant species by the CNPS, listed in Attachment A of the City Biology Guidelines (City 2012), narrow endemic species (City 2012), and vernal pool indicator species (Bauder et al. 2009).

Nomenclature

Nomenclature used in this report follows the conventions used in the City's Biology Guidelines (City 2012) and the MSCP (City 1997). Nomenclature also follows Baldwin et al. (2012) for plants; Holland (1986) and Oberbauer (2008) for vegetation communities; the American Ornithologists' Union (2014) for birds; Collins and Taggart (2002) for reptiles; and Baker et al. (2003) for mammals. Plant species status is taken from the CNPS (2015). Animal species status is from CDFW (2015a and b). Habitat sensitivity is based on the City's Biology Guidelines (City 2012).

RESULTS

Vegetation Communities/Habitats: Pueblo North, MCAS Miramar, and Mast Boulevard Sites

The Pueblo North, Mast Boulevard, and MCAS Miramar sites support 21 vegetation communities/habitats: vernal pool, southern willow scrub, mulefat scrub, riparian woodland, freshwater marsh, herbaceous wetland, disturbed wetland, open water, nonvegetated channel/floodway, coast live oak woodland, native grassland, scrub oak chaparral, coastal sage-chaparral transition (including disturbed), Diegan coastal sage scrub (including disturbed), Diegan coastal sage scrub: baccharis-dominated, chamise chaparral (including disturbed), southern mixed chaparral, non-native grassland, disturbed habitat, non-native vegetation, and developed (Figures 4a, 4e, 4f-1 through 4f-12; Table 1).

Table 1
EXISTING VEGETATION COMMUNITIES/HABITATS
PUEBLO NORTH, MCAS MIRAMAR, MAST BOULEVARD SITES

VEGETATION COMMUNITY/HABITAT	MSCP TIER[†]	PUEBLO NORTH*	MCAS MIRAMAR	MAST BOULEVARD[α]	TOTAL
Vernal pool	Wetland	0.04	1.97[±]	-	2.01
Vernal pool – previously documented by MCAS Miramar[π]	Wetland	-	0.29	-	0.29
Southern willow scrub	Wetland	-	1.52	0.01	1.53
Mulefat scrub	Wetland	-	0.32	0.03	0.35
Riparian woodland	Wetland	-	1.64	-	1.64
Freshwater marsh	Wetland	-	0.36	-	0.36
Herbaceous wetland	Wetland	-	-	1.34	1.34
Disturbed wetland	Wetland	-	-	0.02	0.02
Open water	Wetland	-	0.30	-	0.30
Non-vegetated channel/floodway	Wetland	-	0.70	-	0.70
Wetlands Subtotal		**0.04**	**7.10**	**1.40**	**8.54**
Coast live oak woodland	I	-	1.0	-	1.0
Native grassland	I	1.3	-	-	1.3
Scrub oak chaparral	I	-	4.5	-	4.5
Coastal sage-chaparral transition	II	-	4.1	-	4.1
Diegan coastal sage scrub	II	3.2	24.0	0.1	27.3

Table 1 (cont.)
EXISTING VEGETATION COMMUNITIES/HABITATS
PUEBLO NORTH, MCAS MIRAMAR, MAST BOULEVARD SITES

VEGETATION COMMUNITY/HABITAT	MSCP TIER[†]	PUEBLO NORTH*	MCAS MIRAMAR	MAST BOULEVARD[α]	TOTAL
Diegan coastal sage scrub: baccharis-dominated	II	-	9.8	0.2	10.0
Chamise chaparral	IIIA	-	2.4	-	2.4
Southern mixed chaparral	IIIA	-	0.5	-	0.5
Non-native grassland	IIIB	7.5	11.0	1.9	20.4
Disturbed habitat	IV	2.0	10.1	0.6	12.7
Non-native vegetation	IV	-	0.2	-	0.2
Developed	N/A	-	21.6	0.5	22.1
Uplands Subtotal		**14.0**	**89.2**	**3.3**	**106.5**
TOTAL		**14.04**	**96.30**	**4.70**	**115.04**

† Tiers refer to City MSCP Subarea Plan habitat classification system.

* Acreage of Pueblo North includes an additional study area, which consists of the following communities: 0.4 native grassland, 2.5 non-native grassland, <0.1 Diegan coastal sage scrub, 1.7 disturbed habitat

± One vernal pool (PW 34) was mapped just offsite of MCAS Miramar, and is included in the vegetation community acreages: 0.61 PW 34

α Acreage of Mast Boulevard includes an additional study area, which consists of the following communities: 0.01 southwestern willow scrub, 0.02 mulefat scrub, 0.34 herbaceous wetland, 0.01 disturbed wetland, 0.14 Diegan coastal sage scrub, 0.07 Diegan coastal sage scrub: baccharis-dominated, 1.1 non-native grassland, 0.3 disturbed habitat, 0.3 developed

π Indicates basins previously mapped by MCAS Miramar which are documented to contain vernal pool indicator plant species but which did not pond during the 2015-2016 survey season.

Vernal Pool

Vernal pools are a highly specialized plant habitat that supports a unique flora. Vernal pools are associated with two important physical conditions: a subsurface hardpan or claypan that inhibits the downward percolation of water and a topography characterized by a series of low hummocks called mima mounds and low depressions (the vernal pools), which prevent above ground water runoff. As the result of these two physical conditions, water collects in these depressions during the rainy season. As the rainy season ends and the dry season begins, the water that has collected in these vernal pools is gradually evaporated. As water evaporates from these pools, a gradient of low soil water availability to high soil water availability is created from the periphery of the pool margins to the center of the pool. The chemical composition of the remaining pool water becomes more concentrated as the pool water is evaporated, creating a gradient of low ion concentration at the pool periphery to high ion concentration at the pool center. A temporal succession of plant species will occur at the receding pool margins, depending upon the physical and chemical microenvironmental characteristics of the pool. Vernal pool indicator species observed within these pools include hyssop loosestrife *(Lythrum hyssopifolia*), long leaf plantain (*Plantago elongata*), and woolly marbles (*Psilocarphus brevissimus*) (Attachment A). Seven

vernal pools, totaling 0.04 acre, were identified within the Pueblo North site, and 12 vernal pools, totaling 1.97 acres, were identified within and adjacent to the MCAS Miramar site (four additional vernal pools were previously mapped by MCAS Miramar, totaling 0.29 acre) (Figures 4a and 4f; Tables 3 and 4).

Southern Willow Scrub

Southern willow scrub consists of dense, broadleaved, winter-deciduous stands of trees dominated by shrubby willows (*Salix* sp.) in association with mulefat (*Baccharis salicifolia*), and with scattered emergent cottonwood (*Populus fremontii*) and western sycamores (*Platanus racemosa*). This vegetation community occurs on loose, sandy or fine gravelly alluvium deposited near stream channels during flood flows. Frequent flooding maintains this early seral community, preventing succession to a riparian woodland or forest (Holland 1986). In the absence of periodic flooding, this early seral type would be succeeded by southern cottonwood or western sycamore riparian forest. Approximately 1.52 acres of southern willow scrub occur within the MCAS Miramar site, and approximately 0.01 acre occurs within the Mast Boulevard site.

Mulefat Scrub

Mulefat scrub is an under-developed, shrubby riparian scrub community dominated by mulefat and interspersed with small willows. This vegetation community occurs along intermittent stream channels with a fairly coarse substrate and moderate depth to the water table. This early seral community is maintained by frequent flooding, the absence of which would lead to a cottonwood or sycamore dominated riparian woodland or forest (Holland 1986). In some environments, limited hydrology may favor the persistence of mulefat. Approximately 0.32 acre of mulefat scrub occurs within the MCAS Miramar site, and approximately 0.03 acre occurs within the Mast Boulevard site and associated study area.

Riparian Woodland

Southern riparian woodlands are composed of winter-deciduous trees that require water near the soil surface. Willow (*Salix* sp.), cottonwood (*Populus* sp.), and western sycamore (*Platanus racemosa*) form a dense medium height woodland or forest in moist canyons and drainage bottoms. Associated understory species include mulefat, stinging nettle (*Urtica dioica* ssp. *holosericea*), and wild grape (*Vitis girdiana*; Beauchamp 1986). There may be large canopy gaps within the upper tree stratum. Approximately 1.64 acres of riparian woodland occur within the MCAS Miramar site.

Freshwater Marsh

Coastal and valley freshwater marsh is dominated by perennial, emergent monocots, five to 13 feet tall, forming incomplete to completely closed canopies. This vegetation type occurs along the coast and in coastal valleys near river mouths and around the margins of lakes and springs, freshwater or brackish marshes. These areas are semi- or permanently flooded yet lack a

significant current (Holland 1986). Dominant species include cattails (*Typha* sp.) and bulrushes (*Scirpus* sp.), along with umbrella sedges (*Cyperus* sp.), rushes (*Juncus* sp.), and spike-sedge (*Eleocharis* sp.). Approximately 0.36 acre of freshwater marsh occurs within the MCAS Miramar site.

Herbaceous Wetland

Herbaceous wetland is a low-growing, herbaceous community that is dominated by a variety of native wetland species. It typically occurs in seasonally wet areas with heavy soils. Dominant species usually include wrinkled rush (*Juncus rugulosus*), toad rush (*Juncus bufonius*), and wetland grasses. Common species of this habitat observed on site include cocklebur and western ragweed. Approximately 1.34 acres of herbaceous wetland occur within the Mast Boulevard site and associated study area.

Disturbed Wetland

Disturbed wetlands are dominated by exotic wetland species that invade areas that have been previously disturbed or undergone periodic disturbances. These non-natives become established more readily following natural or human-induced habitat disturbance than the native wetland flora. Approximately 0.02 acre of disturbed wetland occurs within the Mast Boulevard site and is made up of a maintained storm water channel outfall and generally lacks vegetation, but includes some non-native grasses (*Bromus* spp.) re-establishing.

Open Water

Open water is a category describing year-round bodies of water. This includes those portions of water bodies that are usually covered by water and contain less than 10 percent vegetative cover. Approximately 0.30 acre of open water occurs within the MCAS Miramar site.

Non-vegetated Channel/Floodway

Non-vegetated channel/floodway includes the sandy, gravelly, or rocky fringe of waterways or flood channels. These areas are unvegetated on a regularly permanent basis. Variable water lines inhibit the growth of vegetation, although some weedy species of grasses may grow along the outer edges of the wash. Vegetation may exist here but it is usually less than 10 percent total cover. Approximately 0.70 acre of non-vegetated channel/floodway occurs within the MCAS Miramar site.

Coast Live Oak Woodland

Coast live oak woodland is an open to dense evergreen woodland or forest community dominated by coast live oak (*Quercus agrifolia*) that may reach a height of 35 to 80 feet. The shrub layer consists of toyon (*Heteromeles arbutifolia*), Mexican elderberry (*Sambucus mexicana*), spreading snowberry (*Symphoricarpus mollis*), fuchsia-flowered gooseberry (*Ribes speciosum*), and poison oak (*Toxicodendron diversilobum*). A dense herbaceous understory is

dominated by miner's lettuce (*Claytonia perfoliata* var. *perfoliata*) and chickweed (*Stellaria media*). Approximately 1.0 acre of coast live oak woodland occurs within the MCAS Miramar site.

Native Grassland

Native grassland is a community dominated by perennial bunchgrasses such as purple needle grass (*Nassella pulchra*) with annual and perennial forbs such as common golden stars (*Bloomeria crocea* ssp. *crocea*) and California blue-eyed grass (*Sisyrinchium bellum*). Native grasslands generally occur on fine-textured soils that exclude the annual, exotic grasses. Native grasslands occur throughout California as small isolated islands. Approximately 1.3 acres of native grassland occur within the Pueblo North site and associated study area.

Scrub Oak Chaparral

Scrub oak chaparral is a dense, evergreen chaparral up to 20 feet tall, dominated by scrub oak (*Quercus dumosa*) with considerable mountain mahogany (*Cercocarpus betuloides*). Scrub oak chaparral occurs in somewhat more mesic areas than many other chaparrals, such as north facing slopes, and recovers more rapidly from fires than other chaparrals due to resprouting capabilities of scrub oak (Holland 1986). Approximately 4.5 acres of scrub oak chaparral occur within the MCAS Miramar site.

Coastal Sage-Chaparral Transition

Coastal sage-chaparral scrub transition is a mixture of sclerophyllous chaparral shrubs and drought-deciduous sage scrub species regarded as an ecotone (transition) between two vegetation communities. This singular community contains floristic elements of both communities including California sagebrush (*Artemisia californica*), California buckwheat (*Eriogonum fasciculatum* ssp. *fasciculatum*), laurel sumac (*Malosma laurina*), chamise (*Adenostoma fasciculatum*), inland scrub oak (*Quercus berberidifolia*), and ceanothus (*Ceanothus* spp.). This community varies in species composition but always contains coastal sage and chaparral species. Approximately 4.1 acres of coastal sage-chaparral scrub occur within the MCAS Miramar site.

Diegan Coastal Sage Scrub

Diegan coastal sage scrub is the wide-spread coastal sage scrub in coastal southern California. This vegetation community occupies xeric sites characterized by shallow soils. The Diegan coastal sage scrub on site is dominated by California sagebrush, California buckwheat, laurel sumac, lemonadeberry (*Rhus integrifolia*), and black and white sage (*Salvia mellifera* and *S. apiana*). Approximately 24.0 acres of Diegan coastal sage scrub occur within the MCAS Miramar site, approximately 3.2 acres occur within the Pueblo North site and associated study area, and approximately 0.1 acre occurs within the Mast Boulevard site and associated study area.

Diegan Coastal Sage Scrub: baccharis-dominated

Diegan coastal sage scrub: baccharis-dominated is similar to Diegan Coastal Sage Scrub but dominated by *Baccharis* species. It is typically found on disturbed sites or those with nutrient-poor soils. This habitat is often found within other forms of Diegan Coastal Sage Scrub and on upper terraces of river valleys. Dominant species include broom baccharis (*Baccharis sarothroides)* and/or coyote brush (*Baccharis pilularis)*, and may also include California sagebrush, California buckwheat, sawtooth goldenbush (*Hazardia squarrosa)*, Menzies' goldenbush (*Isocoma menziesii*), and black sage in lesser amounts. Approximately 9.8 acres of disturbed habitat occur within the MCAS Miramar site and approximately 0.2 acre occurs within the Mast Boulevard site and associated study area.

Chamise Chaparral

Chamise chaparral is the most widely distributed chaparral shrub and is dominated by the species chamise. This vegetation community is found from Baja to northern California in pure or mixed stands. Chamise chaparral's ubiquitous distribution may be the result of chamise being the only chaparral species that regenerates from fire from both an underground root crown and the production of seeds (Rundel 1986). It often dominates at low elevations and on xeric south facing slopes with 60 to 90 percent canopy cover. Mission manzanita (*Xylococcus bicolor)* and black sage are minor plant species associated within this vegetation community. Approximately 2.4 acres of chamise chaparral occur within the MCAS Miramar site.

Southern Mixed Chaparral

Southern mixed chaparral is composed of broad-leaved sclerophyllous shrubs that can reach six to 10 feet in height and form dense often nearly impenetrable stands with poorly developed understories. In this mixed chaparral the shrubs are generally tall and deep rooted, with a well-developed soil litter layer, high canopy coverage, low light levels within the canopy, and lower soil temperatures. This vegetation community occurs on dry, rocky, often steep north-facing slopes with little soil. Depending upon relative proximity to the coast, southern mixed chaparral is dominated by chamise, mission manzanita, coast white lilac (*Ceanothus verrucosus*), Ramona lilac (*Ceanothus tomentosus*), white-stem wild-lilac (*Ceanothus leucodermis*), big-berry manzanita (*Arctostaphylos glauca*), and scrub oak. Approximately 0.5 acre of southern mixed chaparral occurs within the MCAS Miramar site.

Non-native Grassland

Non-native grassland is characterized by a sparse to dense cover of annual grasses and is often associated with numerous species of showy-flowered, non-native, annual forbs. Most of the introduced, annual species that make up the majority of species and biomass within non-native grassland originate from the Mediterranean region. Characteristic species observed within this vegetation community include oats (*Avena* spp.), bromes (*Bromus* spp.), and rye grasses (*Festuca* spp.). Approximately 11.0 acres of non-native grassland occur within the MCAS

Miramar site, approximately 7.5 acres occur within the Pueblo North site and associated study area, and approximately 1.9 acres occur within the Mast Boulevard site and associated study area.

Disturbed Habitat

Disturbed habitat includes land cleared of vegetation (e.g., dirt roads), land containing a preponderance of non-native plant species such as ornamentals or ruderal exotic species that take advantage of disturbance (previously cleared or abandoned landscaping), or land showing signs of past or present animal usage that removes any capability of providing viable habitat. Approximately 10.1 acres of disturbed habitat occur within the MCAS Miramar site, approximately 2.0 acres occur within the Pueblo North site and associated study area, and approximately 0.6 acre occurs within the Mast Boulevard site and associated study area.

Non-native Vegetation

Non-native vegetation is a category describing stands of naturalized trees and shrubs (e.g., acacia [*Acacia* sp.], peppertree [*Schinus* sp.]), many of which are also used in landscaping. Approximately 0.2 acre of non-native vegetation occurs within the MCAS Miramar site.

Developed

Developed land is where permanent structures and/or pavement have been placed, which prevents the growth of vegetation, or where landscaping is clearly tended and maintained. Approximately 21.6 acres of developed land occur within the MCAS Miramar site; and approximately 0.5 acre occurs within the Mast Boulevard site and associated study area.

Plants

A total of 147 plant species were observed across all six sites during the biological surveys (Attachment A).

Animals

A total of 51 animal species, including seven invertebrate, four amphibian, three reptile, and 37 bird species, were observed or detected across all six sites during the biological survey (Attachment B).

Sensitive Resources: Pueblo North, MCAS Miramar, and Mast Boulevard Sites

Sensitive Vegetation Communities

Sensitive vegetation communities are considered either rare within the region or sensitive by CDFW; are listed as sensitive under the MSCP (City 1997a) or the City's Biology Guidelines

(2012); or support sensitive plants or animals. They are considered sensitive because they have been depleted, are naturally uncommon, or support sensitive species.

Sensitive vegetation communities that occur within the study areas include chamise chaparral, coast live oak woodland, coastal sage-chaparral scrub transition, Diegan coastal sage scrub, Diegan coastal sage scrub: baccharis-dominated, native grassland, non-native grassland, scrub oak chaparral, southern mixed chaparral, and vernal pool. Mitigation in accordance with the MSCP regulations is required for impacts to sensitive vegetation communities.

Sensitive Plants

Sensitive plant species are considered uncommon or limited in that they (1) are only found in the San Diego region, (2) are a local representative of a species or association of species not otherwise found in the region, or (3) are severely depleted within their ranges or within the region. Specifically, sensitive plants would include federal and state listed species, MSCP covered species, City narrow endemic species, and CNPS Rank 1-4 species.

No federally or state listed plant species, or MSCP covered species, were observed within the study areas. Two sensitive plant species were observed within the study areas: graceful tarplant (*Holocarpha virgata* spp. *elongata*) and San Diego sagewort (*Artemisia palmeri*). Neither of these species is MSCP covered nor a City narrow endemic species.

Graceful tarplant (*Holocarpha virgata* spp. *elongata*)
Status: --/--; CRPR 4.2
Distribution: San Diego, Orange, and Riverside
Habitat(s): Chaparral, valley grassland, foothill woodland, and coastal sage scrub
Status on site: Approximately 153 individuals were estimated on the MCAS Miramar site and approximately 45 individuals were documented on the Pueblo North site (Figures 5a and 5e).

San Diego sagewort (*Artemisia palmeri*)
Listing: --/--; CNPS List 4.2
Distribution: Coastal San Diego County; Baja California, Mexico
Habitat: Stream courses, often within coastal sage scrub and southern mixed chaparral
Status on site: A total of 27 individuals were observed on the MCAS Miramar site (Figure 5e).

No other sensitive plant species, including City narrow endemic species, were observed during the biological surveys that took place between October 2015 and September 2016.

Sensitive Animals

Sensitive animal species are considered those listed as federal/state endangered or threatened, proposed for listing, fully protected by CDFW, MSCP covered species, or California species of special concern. Five sensitive animal species were observed or detected within the study areas during the biological surveys: white-tailed kite, coastal California gnatcatcher, Belding's orange-throated whiptail, two-striped garter snake, and San Diego fairy shrimp.

White-tailed kite (*Elanus leucurus*)
Status: --/Fully Protected
Distribution: Primarily occurs throughout coastal slopes of San Diego County
Habitat(s): Riparian woodlands and oak or sycamore groves adjacent to grassland
Status on site: A white-tailed kite was observed on multiple site visits foraging on and adjacent to the Pueblo North site. There is not any suitable nesting habitat on or directly adjacent to the site for this species; therefore, it is not expected to nest on the site (Figure 5a).

Coastal California gnatcatcher (*Polioptila californica californica*)
Status: FT/SSC
Distribution: In San Diego County, occurs throughout coastal lowlands
Habitat(s): Coastal sage scrub
Status on site: Four individuals were detected within or adjacent to the northern portion of the MCAS Miramar site (Figure 5e).

Belding's orange-throated whiptail (*Aspidoscelis hyperythrus beldingi*)
Status: --/SSC, MSCP Covered, MHCP Covered, MSHCP Covered
Distribution: Southern Orange and southern San Bernardino counties, south through Baja California
Habitat(s): Coastal sage scrub, chaparral, edges of riparian woodlands, and washes. Also found in weedy, disturbed areas adjacent to these habitats. Important habitat requirements include open, sunny areas, shaded areas, and abundant insect prey base, particularly termites (*Reticulitermes* sp.).
Status on site: Two individuals were observed within the northern portion of the MCAS Miramar site (Figure 5e).

Two-striped gartersnake (*Thamnophis hammondii*)
Status: --/SSC
Distribution: Monterey County south through the coastal ranges into northwestern Baja California
Habitat(s): Occurs along permanent and intermittent streams bordered by dense riparian vegetation, but occasionally associated with vernal pools or stock ponds
Status on site: Three individuals were observed within the northern portion of the MCAS Miramar site (Figure 5e).

San Diego fairy shrimp (*Branchinecta sandiegonensis*)
Status: FE/--
Distribution: San Diego County and extreme northern Baja California, Mexico.
Habitat(s): Seasonally astatic pools which occur in tectonic swales or earth slump basins and other areas of shallow, standing water often in patches of grassland and agriculture interspersed in coastal sage scrub and chaparral.
Status on site: San Diego fairy shrimp were observed within one vernal pool on the MCAS Miramar site during the 2015-2016 sampling season, and were documented within 10 additional pools during the 2008 surveys (Figure 5e).

Vegetation Communities/Habitats: Pueblo Central, Pueblo South, and Sander East Sites

The Pueblo Central, Pueblo South, and Sander East sites support 14 vegetation communities/habitats: vernal pool, southern willow scrub, disturbed wetland, native grassland, scrub oak chaparral, coastal sage-chaparral transition, Diegan coastal sage scrub (including disturbed), Diegan coastal sage scrub: baccharis-dominated, chamise chaparral, non-native grassland, eucalyptus woodland, disturbed habitat, non-native vegetation, and developed (Figures 4b, 4c, 4d; Table 2).

Table 2
EXISTING VEGETATION COMMUNITIES/HABITATS
PUEBLO CENTRAL, PUEBLO SOUTH, AND SANDER EAST SITES

VEGETATION COMMUNITY/ HABITAT	MSCP TIER†	PUEBLO CENTRAL*	PUEBLO SOUTH±	SANDER EAST α	TOTAL
Vernal pool	Wetland	0.01	0.04	0.02	**0.06**
Southern willow scrub	Wetland	-	0.23	-	**0.23**
Disturbed wetland	Wetland	-	-	1.93	**1.93**
Wetlands Subtotal		**0.01**	**0.27**	**1.95**	**2.23**
Native grassland	I	0.1	-	-	**0.1**
Scrub oak chaparral	I	7.4	-	1.1	**8.5**
Coastal sage-chaparral transition	II	-	-	14.6	**14.6**
Diegan coastal sage scrub	II	5.0	9.5	1.5	**16.0**
Diegan coastal sage scrub: baccharis-dominated	II	1.9	-	1.2	**3.1**
Chamise chaparral	IIIA	16.6	15.9	2.5	**35.0**
Non-native grassland	IIIB	1.1	2.9	-	**4.0**
Eucalyptus woodland	IV	0.1	1.5	0.4	**2.0**
Disturbed habitat	IV	3.5	3.9	10.7	**18.1**
Non-native vegetation	IV	0.6	3.8	0.1	**4.5**
Developed	N/A	0.4	3.0	1.7	**5.1**
Uplands Subtotal		**36.7**	**40.5**	**33.8**	**111.0**
TOTAL		**36.71**	**40.77**	**35.75**	**113.23**

† Tiers refer to City MSCP Subarea Plan habitat classification system.

* Acreage of Pueblo Central includes an additional study area, which consists of the following communities: 0.01 vernal pool, 0.7 scrub oak chaparral, 1.1 Diegan coastal sage scrub, 0.2 Diegan coastal sage scrub: baccharis-dominated, 1.8 chamise chaparral, 0.2 non-native grassland, 0.1 Eucalyptus woodland, 0.8 disturbed habitat, 0.5 non-native vegetation, 0.4 developed

± Acreage of Pueblo South includes an additional study area, which consists of the following communities: 0.01 vernal pool, 0.02 southern willow scrub, 2.5 Diegan coastal sage scrub, 0.3 chamise chaparral, 0.4 non-native grassland, 0.5 Eucalyptus woodland, 1.5 disturbed habitat, 0.7 non-native vegetation, 1.4 developed

α Acreage of Sander East includes an additional study area, which consists of the following communities: 0.1 disturbed wetland, 1.0 coastal sage-chaparral transition, 0.6 Diegan coastal sage scrub, 0.1 Eucalyptus woodland, 2.4 disturbed habitat, 1.7 developed

Vernal Pool

See description in the Pueblo North/MCAS Miramar/Mast Boulevard results section above. Six vernal pools were documented within the Pueblo Central site, totaling 0.01 acre; six vernal pools were documented within the Pueblo South site, totaling 0.04 acre, and three vernal pools were documented within the Sander East site, totaling 0.02 acre (Figures 4b-d; Tables 2 and 3).

Southern Willow Scrub

See description in the Pueblo North/MCAS Miramar/Mast Boulevard results section above. Approximately 0.23 acre of southern willow scrub occurs within the Pueblo South site and associated study area (Figure 4c; Table 2).

Disturbed Wetland

See description in the Pueblo North/MCAS Miramar/Mast Boulevard results section above. The disturbed wetland on the Sander East site comprises approximately 1.92 acres and is dominated by pampas grass (*Cortaderia* spp.), tamarisk (*Tamarix* spp.), eucalyptus (*Eucalyptus* spp.), date palm (*Phoenix* spp.), Washington fan palm (*Washingtonia robusta*), and Bermuda grass (*Cynodon dactylon*). Approximately 1.93 acres of disturbed wetland occur within the Sander East site and associated study area (Figure 4d; Table 2).

Native Grassland

See description in the Pueblo North/MCAS Miramar/Mast Boulevard results section above. Less than 0.1 acre of native grassland occurs within the Pueblo Central site and associated study area. Approximately 0.1 acre of native grassland occurs within the Pueblo Central site and associated study area (Figure 4c; Table 2).

Scrub Oak Chaparral

See description in the Pueblo North/MCAS Miramar/Mast Boulevard results section above. Approximately 7.4 acres of scrub oak chaparral occur within the Pueblo Central site and associated study area and approximately 1.1 acres occur within the Sander East site and associated study area (Figures 4b and 4d; Table 2).

Coastal Sage-Chaparral Transition

See description in the Pueblo North/MCAS Miramar/Mast Boulevard results section above. Approximately 14.6 acres of coastal sage- chaparral transition occur within the Sander East site and associated study area (Figure 4d; Table 2).

Diegan Coastal Sage Scrub

See description in the Pueblo North/MCAS Miramar/Mast Boulevard results section above. Approximately 5.0 acres of Diegan coastal sage scrub occur within the Pueblo Central site and associated study area, approximately 9.5 acres occur within the Pueblo South site and associated study area, and approximately 1.5 acres occur within the Sander East site and associated study area (Figures 4b-d; Table 2).

Diegan coastal sage scrub: baccharis-dominated

See description in the Pueblo North/MCAS Miramar/Mast Boulevard results section above. Approximately 1.9 acres of Diegan coastal sage scrub: baccharis-dominated habitat occur within the Pueblo Central site and associated study area and approximately 1.2 acres occur within the Sander East study area (Figures 4b and 4d; Table 2).

Chamise Chaparral

See description in the Pueblo North/MCAS Miramar/Mast Boulevard results section above. Approximately 16.6 acres of chamise chaparral occur within the Pueblo Central site and associated study area, approximately 15.9 acres occur within the Pueblo South site and associated study area, and approximately 2.5 acres occur within the Sander East site (Figures 4b-d; Table 2).

Non-native Grassland

See description in the Pueblo North/MCAS Miramar/Mast Boulevard results section above. Approximately 1.1 acres of non-native grassland occur within the Pueblo Central site and associated study area and approximately 2.9 acres occur within the Pueblo South site and associated study area (Figures 4b and 4c; Table 2).

Eucalyptus Woodland

Eucalyptus woodland is dominated by eucalyptus (*Eucalyptus* sp.), an introduced species that has often been planted purposely for wind blocking, ornamental, and hardwood production purposes. Most groves are monotypic with the most common species being either the blue gum (*Eucalyptus gunnii*) or red gum (*E. camaldulensis* ssp. *obtusa)*. The understory within well-established groves is usually very sparse due to the closed canopy and allelopathic nature of the abundant leaf and bark litter. If sufficient moisture is available, this species becomes naturalized and is able to reproduce and expand its range. Approximately 0.1 acre of eucalyptus woodland occurs within the Pueblo Central site and associated study area, approximately 1.5 acres occur within the Pueblo South site and associated study area, and approximately 0.4 acre occurs within the Sander East site and associated study area (Figures 4b-d; Table 2).

Disturbed habitat

See description in the Pueblo North/MCAS Miramar/Mast Boulevard results section above. Approximately 3.5 acres of disturbed habitat occur within the Pueblo Central site and associated study area, approximately 3.9 acres occur within the Pueblo South site and associated study area, and approximately 10.7 acres occur within the Sander East site and associated study area (Figures 4b-d; Table 2).

Non-native Vegetation

See description in the Pueblo North/MCAS Miramar/Mast Boulevard results section above. Approximately 0.6 acre of non-native vegetation occurs within the Pueblo Central site and associated study area, approximately 3.8 acres occur within the Pueblo South site and associated study area, and approximately 0.1 acre occurs within the Sander East site and associated study area (Figures 4b-d; Table 2).

Developed

See description in the Pueblo North/MCAS Miramar/Mast Boulevard results section above. Approximately 0.4 acre of developed land occurs within the Pueblo Central site and associated study area, approximately 3.0 acres occur within the Pueblo South site and associated study area, and approximately 1.7 acres occur within the Sander East site and associated study area (Figures 4b-d; Table 2).

Sensitive Resources: Pueblo Central, Pueblo South, and Sander East Sites

Sensitive Vegetation Communities

Sensitive vegetation communities that occur within the Pueblo Central, Pueblo South, and Sander East sites include native grassland, Diegan coastal sage scrub, Diegan coastal sage scrub: baccharis-dominated, non-native grassland, chamise chaparral, and scrub oak chaparral.

Sensitive Plants

No federally or state listed plant species were observed within the Pueblo Central, Pueblo South, and Sander East sites. Seven sensitive plant species were observed: Orcutt's brodiaea (*Brodiaea orcuttii*), long-spined spineflower (*Chorizanthe polygonoides* var. *longispina*), San Diego barrel cactus (*Ferocactus viridescens*), Nuttall's scrub oak (*Quercus dumosa*), ashy spike-moss (*Selaginella cinerascens*), San Diego County viguiera (*Viguiera laciniata*), and graceful tarplant (*Holocarpha virgata* spp. *elongata*).

Orcutt's brodiaea (*Brodiaea orcuttii*)
Listing: --/--; CNPS List 1B.1; City MSCP Covered
Distribution: Riverside and San Bernardino counties south to Baja California, Mexico
Habitat: Vernally moist grasslands, mima mound topography, and vernal pool periphery are preferred habitat. Occasionally will grow on streamside embankments in clay soils.
Status on site: A total of 130 individuals were estimated within the Sander East site (Figure 5d).

San Diego barrel cactus (*Ferocactus viridescens*)
Listing: --/--; CNPS List 2.1; City MCSP Covered
Distribution: San Diego County; Baja California, Mexico
Habitat: Optimal habitat for this cactus appears to be Diegan coastal sage scrub hillsides, often at the crest of slopes and growing among cobbles. Occasionally found on vernal pool periphery and mima mound topography in Otay Mesa.
Status on site: One individual was documented in the western portion of the Sander East site (Figure 5d).

Nuttall's scrub oak (*Quercus dumosa*)
Listing: --/--; CNPS List 1B.1
Distribution: San Diego, Orange, and Santa Barbara counties; Baja California, Mexico
Habitat: Chaparral with a relatively open canopy cover is the preferred habitat in flat terrain (also found in coastal scrub). On north-facing slopes, may grow in dense monotypic stands. Sandy or clay loam soils
Status on site: A total of 432 individuals were estimated within the Sander East site (Figure 5d).

Ashy spike-moss (*Selaginella cinerascens*)
Listing: --/--; CNPS List 4.1
Distribution: Orange and San Diego counties; northwestern Baja California, Mexico
Habitat: Flat mesas in coastal sage scrub and chaparral. A good indicator of site degradation, as it rarely inhabits disturbed soils.
Status on site: A total of 2,921 individuals were estimated within the Sander East site (Figure 5d).

San Diego County viguiera (*Viguiera laciniata*)
Listing: --/--; CNPS List 4.2
Distribution: San Diego and Orange County; Baja California, Mexico
Habitat: Diegan coastal sage scrub. Generally, shrub cover is more open than at mesic, coastal locales supporting sage scrub. Occurs on a variety of soil types.
Status on site: One individual was documented within the western portion of the Sander East site (Figure 5d).

Long-spined spineflower (*Chorizanthe polygonoides* var. *longispina*)
Listing: --/--; CNPS List 1B.2
Distribution: Western Riverside, San Diego, and Santa Barbara counties; Baja California, Mexico
Habitat: This small annual is typically found on clay lenses largely devoid of shrubs and can be occasionally seen on vernal pool peripheries.
Status on site: A minimum of 15,992 individuals were estimated within the Sander East site (Figure 5d).

Graceful tarplant (*Holocarpha virgata* spp. *elongata*)
Status: --/--; CRPR 4.2
Distribution: San Diego, Orange, and Riverside
Habitat(s): Chaparral, valley grassland, foothill woodland, and coastal sage scrub
Status on site: A total of 101 individuals were estimated within the Pueblo South site and 160 individuals were estimated within the Pueblo Central site (Figures 5b and 5c).

No other sensitive plant species, including City narrow endemic species, were observed during the biological surveys that took place between October 2015 and September 2016.

Sensitive Animals

Sensitive animal species are considered those listed as federal/state endangered or threatened, proposed for listing, fully protected by CDFW, MSCP covered species, or California species of special concern. Two sensitive animal species were observed or detected within the Pueblo Central, Pueblo South, and Sander East sites during the biological surveys: San Diego fairy shrimp and western spadefoot toad.

San Diego fairy shrimp (*Branchinecta sandiegonensis*)
Status: FE/--
Distribution: San Diego County and extreme northern Baja California, Mexico.
Habitat(s): Seasonally astatic pools which occur in tectonic swales or earth slump basins and other areas of shallow, standing water often in patches of grassland and agriculture interspersed in coastal sage scrub and chaparral
Status on site: San Diego fairy shrimp were observed within two vernal pools on the Sander East site and four ponding areas within the Pueblo South site, three of which are classified as vernal pools and one of which contained no vernal pool indicator plant species (Table 3, Figures 5c and 5d).

Western spadefoot (*Spea hammondii*)
Status: --/SSC
Distribution: Throughout the Central Valley and San Francisco Bay area south along the coast to northwestern Baja California
Habitat: Occurs in open coastal sage scrub, chaparral, and grassland, along sandy or gravelly washes, floodplains, alluvial fans, or playas; require temporary pools for breeding and friable soils for burrowing; generally excluded from areas with bullfrogs (*Rana catesbiana*) or crayfish (*Procambarus* sp)
Status on site: One individual was observed on the eastern portion of the Sander East site (Figure 5d).

Wet Season Fairy Shrimp

Out of a total of 82 mapped basins, 41 were inundated long enough for sampling during the 2015-2016 wet season; however five of these pools were not sampled due to the documentation of SDFS in 2008 (MCAS Miramar 2016). Fairy shrimp were collected from 11 of the 36 sampled basins on the survey sites. Three basins were sampled at Sander East; two basins contained San Diego fairy shrimp and one basin did not contain fairy shrimp (Figure 6a). Twenty-one basins were sampled at MCAS Miramar; one basin contained San Diego fairy shrimp, two basins contained versatile fairy shrimp, one basin contained a single unidentified female *Branchinecta*, and 19 basins contained no fairy shrimp (Figure 6b). The single basin that contained an unidentified female *Branchinecta*, PW 47, has been documented to contain versatile fairy shrimp (personal communication between Charles Black and Summer Adleberg, September 6, 2016). MCAS Miramar data shows that 19 basins within the study area have been documented to contain San Diego fairy shrimp (MCAS Miramar 2016). Of these 19 basins, 10 were mapped by Rocks (PW 31, 33, 34, 35, 36, 37, 38, 39, 40, and 41) during 2015-2016, and were not sampled for San Diego fairy shrimp due to the known presence of this species (Table 4). However, five of these basins (PW31, 34, 38, 40, and 41) were sampled for Riverside fairy shrimp and no individuals of this species were found. No Riverside fairy shrimp have been previously documented in any of the sampled basins that occur within the footprint of the MCAS Miramar site (MCAS Miramar 2016). Two basins were sampled at Mast Boulevard and neither contained any fairy shrimp (Figure 6c). One basin was sampled at Pueblo North and contained versatile fairy shrimp (Figure 6d). One basin was sampled at Pueblo Central and did not contain fairy shrimp (Figure 6e). Eight basins were sampled at Pueblo South; four basins contained San Diego fairy shrimp and four basins did not contain fairy shrimp (Figure 6f). No Riverside fairy shrimp were documented during the 2015-2016 surveys. Results are summarized in Tables 3 and 4.

In addition to the 36 sampled basins, 46 other basins are present on the survey sites. These basins were inundated for less than seven days and therefore not sampled for fairy shrimp this season. One basin, PW28, was eliminated from sampling on February 15, 2016 because it was filled in with gravel. This area is known only to have supported *Branchinecta lindahli* and was filled with gravel as part of regular road maintenance and to prevent the spread of *B. lindahli* to adjacent basins (personal communication between Ms. Adleberg and Charles Black [MCAS Miramar] August 25, 2016).

In addition, USFWS granted permission to discontinue sampling at five *B. sandiegonensis* occupied basins before reaching 120 days of continuous inundation. Permission to discontinue sampling at PW25 (Sander East) was received on December 14, 2015 and permission to discontinue sampling at PW72, PW73, PW74, and PW75 (Pueblo South) was received on January 22, 2016 (Rocks 2016).

Dry Season Fairy Shrimp

HELIX documented *Branchinecta* cysts within the Sander East, MCAS Miramar, Pueblo North, Pueblo Central, and Pueblo South study areas (Tables 3 and 4). Soil from the three Pueblo North basins containing cysts, PW 55, 56, and 57, was sent to D. Christopher Rogers to complete the hatching protocol, and all cultures produced the non-listed fairy shrimp *Branchinecta lindahli* (dry season report *in prep*). Within the MCAS Miramar study area, *Branchinecta* cysts were observed in 21 basins. Of the 21 basins containing cysts, previous wet season surveys identified San Diego Fairy Shrimp in 9 of them. Cysts from these basins were not sent for hatching, as they are assumed to be from San Diego fairy shrimp. Cultures from the remaining 12 basins containing cysts, PW 28, 29, 43, 46-50, 52, 80, 81, and 82, were sent for hatching and produced the non-listed fairy shrimp *B. lindahli*.

Vernal Pool Mapping

Vernal pools were mapped in accordance with the City's Land Development Code Biology Guidelines (City 2012). Additional information was provided by MCAS Miramar regarding previous vernal pool mapping efforts within MCAS Miramar jurisdiction (Black 2009). The MCAS Miramar Vernal Pool Geographic Information System Database classifies vernal pool resources into "type" categories, with the "pool" type referring to vernal pools. All other types are referred to as "other seasonally ponded features" (OSPF). MCAS Miramar's "pool" definition differs from the City's Land Biology Guidelines in that it requires that the pool originate from natural processes "or purposeful creation/restoration activities" (Black 2009). As a result, within MCAS Miramar land, road ruts and basins that are a result of human disturbance are not classified as "pools" regardless if they contain vernal pool indicator plant species and/or threatened/endangered fairy shrimp species. Historical data provided by MCAS is included in conjunction with 2015-2016 vernal pool sampling results (Table 4, Figure 7).

Table 3
2016 WET SEASON/DRY SEASON SURVEY RESULTS FOR ALL SITES EXCEPT MCAS MIRAMAR

BASIN NUMBER	WET SEASON			DRY SEASON	VERNAL POOL INDICATOR PLANT SPECIES PRESENT (Y/N)	CLASSIFIED AS VERNAL POOL* (Y/N)
	Inundated for 7 or more days in 2016 (Y/N)	Presence of SDFS[1] (Y/N)	Presence of VFS[1] (Y/N)	*Branchinecta* cysts present		
Sander East						
PW1	N	-	-	N	Y	Y
PW2	N	-	-	N	Y	Y
PW3	N	-	-	N	N	N
PW4	N	-	-	N	Y	Y
PW5	N	-	-	N	N	N
PW6	N	-	-	N	Y	Y
PW7	N	-	-	N	Y	Y
PW8	N	-	-	N	Y	Y
PW9	N	-	-	N	Y	Y
PW10	N	-	-	Y	Y	Y
PW11	N	-	-	Y	Y	Y
PW12	N	-	-	N	Y	Y
PW13	N	-	-	Y	N	N
PW14	N	-	-	N	N	N
PW15	N	-	-	N	N	N
PW16	Y	Y	N	Y	Y	Y
PW17	N	-	-	N	Y	Y
PW18	N	-	-	N	Y	Y
PW19	N	-	-	N	N	N
PW20	N	-	-	N	Y	Y

Table 3 (cont.)
2016 WET SEASON/DRY SEASON SURVEY RESULTS FOR ALL SITES EXCEPT MCAS MIRAMAR

BASIN NUMBER	WET SEASON			DRY SEASON	VERNAL POOL INDICATOR PLANT SPECIES PRESENT (Y/N)	CLASSIFIED AS VERNAL POOL* (Y/N)
	Inundated for 7 or more days in 2016 (Y/N)	Presence of SDFS[1] (Y/N)	Presence of VFS[1] (Y/N)	*Branchinecta* cysts present		
Sander East (cont.)						
PW21	N	-	-	N	Y	Y
PW22	N	-	-	N	Y	Y
PW23	N	-	-	N	Y	Y
PW24	N	-	-	N	Y	Y
PW25	Y	Y	N	Y	Y	Y
PW26	N	-	-	N	N	N
PW27	N	-	-	N	Y	Y
PW78	Y	N	N	N	Y	Y
Mast Boulevard						
PW53	N	-	-	N	N	N
PW54	Y	N	N	N	N	N
PW79	Y	N	N	N	N	N
Pueblo North						
PW1	N	-	-	N	N	N
PW5	N	-	-	N	Y	Y
PW6	N	-	-	N	Y	Y
PW7	N	-	-	N	N	N
PW8	N	-	-	N	Y	Y
PW9	N	-	-	N	N	N
PW55	N	-	-	Y[†]	Y	Y

Table 3 (cont.)
2016 WET SEASON/DRY SEASON SURVEY RESULTS FOR ALL SITES EXCEPT MCAS MIRAMAR

BASIN NUMBER	WET SEASON			DRY SEASON	VERNAL POOL INDICATOR PLANT SPECIES PRESENT (Y/N)	CLASSIFIED AS VERNAL POOL* (Y/N)
	Inundated for 7 or more days in 2016 (Y/N)	Presence of SDFS[1] (Y/N)	Presence of VFS[1] (Y/N)	*Branchinecta* cysts present		
Pueblo North (cont.)						
PW56	Y	N	Y	Y[†]	Y	Y
PW57	N	-	-	Y[†]	Y	Y
PW58	N	-	-	N	Y	Y
PW59	N	-	-	N	N	N
Pueblo Central						
PW60	Y	N	N	Y	Y	Y
PW61	Y	N	N	N	Y	Y
PW62	Y	N	N	N	Y	Y
PW63	Y	N	N	N	Y	Y
PW64	Y	N	N	Y	Y	Y
PW65	Y	N	N	N	N	N
PW66	Y	N	N	N	N	N
PW67	Y	N	N	N	Y	Y

Table 3 (cont.)
2016 WET SEASON/DRY SEASON SURVEY RESULTS FOR ALL SITES EXCEPT MCAS MIRAMAR

BASIN NUMBER	WET SEASON			DRY SEASON	VERNAL POOL INDICATOR PLANT SPECIES PRESENT (Y/N)	CLASSIFIED AS VERNAL POOL* (Y/N)
	Inundated for 7 or more days in 2016 (Y/N)	Presence of SDFS[1] (Y/N)	Presence of VFS[1] (Y/N)	*Branchinecta* cysts present		
Pueblo South						
PW68	Y	N	N	N	Y	Y
PW69	Y	N	N	N	N	N
PW70	Y	N	N	Y	Y	Y
PW71	Y	N	N	Y	Y	Y
PW72	Y	Y	N	Y	Y	Y
PW73	Y	Y	N	Y	Y	Y
PW74	Y	Y	N	Y	N	N
PW75	Y	Y	N	Y	Y	Y

*Based on presence of obligate plant species (Bauder et al. 2009)
[1]SDFS=San Diego fairy shrimp; VFS=versatile fairy shrimp
†Hatching results yielded the versatile fairy shrimp in each of the samples that were cultured

Table 4
2016 WET SEASON/DRY SEASON SURVEY RESULTS FOR MCAS MIRAMAR

VERNAL POOL NUMBER	2016 WET SEASON			2016 DRY SEASON	VERNAL POOL INDICATOR PLANT SPECIES PRESENT IN 2016(Y/N)	CLASSIFIED AS CITY VERNAL POOL* (Y/N)	PREVIOUSLY MAPPED BY MCAS MIRAMAR (Y/N)	ACCORDING TO MIRAMAR DATABASE				
	Inundated for 7 or more days in 2016 (Y/N)	Presence of SDFS[1] (Y/N)	Presence of VFS[1] (Y/N)	*Branchinecta* cysts present				PRESENCE OF SDFS[1] (Y/N)	PRESENCE OF VFS[1] (Y/N)	VERNAL POOL INDICATOR PLANT SPECIES PRESENT (Y/N)	LISTED PLANT SPECIES	MCAS MIRAMAR BASIN TYPE[1]
PW28	Y	N	Y	Y†	N	Y	Y	N	Y	Y	N	OSPF
PW29	N	-	-	Y†	N	Y	Y	N	Y	Y	N	OSPF
PW30	N	-	-	N	N	N	Y	N	N	N	N	OSPF
PW31	Y	N	N	Y	N	N	Y	Y	N	N	N	OSPF
PW32	Y	N	N	N	Y	Y	N	N	N	N	N	OSPF
PW33	Y	not sampled		Y	N	Y	Y	Y	N	Y	N	OSPF
PW34	Y	N	N	Y	Y	Y	Y	Y	N	Y	N	OSPF
PW35	Y	not sampled		Y	Y	Y	Y	Y	N	Y	N	OSPF
PW36	Y	not sampled		Y	Y	Y	Y	Y	N	Y	N	OSPF
PW37	Y	not sampled		Y	N	N	Y	Y	Y	N	N	OSPF
PW38	Y	N	N	Y	N	N	Y	Y	N	N	N	OSPF
PW39	Y	not sampled		Y	Y	Y	Y	Y	N	Y	N	OSPF
PW40	Y	N	N	N	Y	Y	Y	Y	N	Y	N	OSPF
PW41	Y	Y	N	Y	Y	Y	Y	Y	N	Y	N	VP
PW42	Y	N	N	N	Y	Y	N	N	N	N	N	OSPF
PW43	Y	N	N	Y†	N	Y	Y	N	N	Y	N	OSPF
PW44	Y	N	N	N	N	N	N	N	N	N	N	OSPF
PW45	Y	N	N	N	Y	Y	N	N	N	N	N	OSPF
PW46	Y	N	N	Y†	N	Y	Y	N	Y	Y	N	OSPF
PW47	Y	U	U	Y†	Y	Y	Y	N	Y	Y	N	OSPF
PW48	Y	N	Y	Y†	Y	Y	Y	N	Y	N	N	OSPF
PW49	Y	N	N	Y†	N	N	Y	N	N	N	N	OSPF
PW50	Y	N	N	Y†	Y	Y	Y	N	N	N	N	OSPF
PW51	Y	N	N	N	N	N	N	N	N	N	N	OSPF
PW52	Y	N	N	Y†	N	N	Y	N	N	N	N	OSPF
PW76	N	-	-	N	N	N	N	N	N	N	N	OSPF
PW77	N	-	-	N	N	N	N	N	N	N	N	OSPF
PW80	Y	N	N	Y†	N	N	N	N	N	N	N	OSPF
PW81	Y	N	N	Y†	N	N	N	N	N	N	N	OSPF
PW82	Y	N	N	Y†	N	N	N	N	N	N	N	OSPF

Table 4 (cont.)
MIRAMAR VERNAL POOL SURVEY RESULTS

VERNAL POOL NUMBER	2016 WET SEASON			2016 DRY SEASON	VERNAL POOL INDICATOR PLANT SPECIES PRESENT IN 2016(Y/N)	CLASSIFIED AS CITY VERNAL POOL 2016* (Y/N)	PREVIOUSLY MAPPED BY MCAS MIRAMAR (Y/N)	ACCORDING TO MIRAMAR DATABASE				
	Inundated in 2016 (Y/N)	Presence of SDFS[1] (Y/N)	Presence of VFS[1] (Y/N)	*Branchinecta* cysts present				PRESENCE OF SDFS[1] (Y/N)	PRESENCE OF VFS[1] (Y/N)	VERNAL POOL INDICATOR PLANT SPECIES PRESENT (Y/N)	LISTED PLANT SPECIES	MCAS MIRAMAR BASIN TYPE[1]
Additional "Other Seasonally Ponded Features: previously mapped by MCAS Miramar												
VP656	-	-	-	-	-	Y[±]	Y	Y	N	Y	N	OSPF
VP654	-	-	-	-	-	Y[±]	Y	Y	N	Y	N	OSPF
VP653	-	-	-	-	-	Y[±]	Y	Y	N	Y	N	OSPF
VP631	-	-	-	-	-	N	Y	Y	N	N	N	OSPF
VP697	-	-	-	-	-	N	Y	Y	N	N	N	OSPF
VP699	-	-	-	-	-	N	Y	Y	N	N	N	OSPF
VP700	-	-	-	-	-	N	Y	Y	N	N	N	OSPF
VP432	-	-	-	-	-	N	Y	Y	N	N	N	OSPF
VP582	-	-	-	-	-	Y[±]	Y	Y	N	Y	N	OSPF

*Based on presence of obligate plant species (Bauder et al. 2009) that were observed during 2016 surveys and in prior years by MCAS Miramar
[1]OSPF=Other Seasonally Ponded Features (MCAS Miramar 2016); SDFS=San Diego fairy shrimp; VFS=versatile fairy shrimp
[†]Hatching results yielded the versatile fairy shrimp in each of the samples that were cultured
[±]Displayed on separate line in Table 1, indicating basins which are classified as vernal pools by City of San Diego's Land Development Code Biology Guidelines (City of San Diego, 2012)

Jurisdictional Waters and Wetlands

A formal jurisdictional delineation was not conducted for the Pueblo North site, but HELIX and Rocks evaluated the site for potential jurisdictional drainages and none were identified. The vernal pools mapped on the Pueblo North site are considered isolated from navigable waters with no federal nexus that would allow these pools to be considered jurisdictional wetlands by the U.S. Army Corps of Engineers (USACE) under the federal Clean Water Act. The Regional Water Quality Control Board (RWQCB) may try to assert jurisdiction over the vernal pools as wetland waters of the State under the Porter Cologne Act; however, these pools are small, isolated, and contain limited biological value given that they do not support listed species. Finally the vernal pools would be considered City wetlands in accordance with the City's Biological Guidelines.

HELIX relied on previous data from MCAS Miramar for jurisdictional information on the MCAS Miramar site because a formal jurisdictional delineation was not conducted. Several jurisdictional features were identified within the boundaries of the MCAS Miramar study area and are displayed in Figures 8a-c. Areas identified as wetlands by MCAS Miramar intersect the study area in the northern and central portions of the site. Additionally, MCAS Miramar's database included several areas that were classified as planning level waters of the U.S., including a drainage that crosses the northern portion of the study area. The MCAS Miramar database also included several smaller drainages that were classified as non-wetland WUS, and those drainages cross the study area throughout the length of the MCAS Miramar site.

Herbaceous wetland habitat was mapped at the Mast Boulevard site and a portion of it may be jurisdictional. A drainage containing disturbed wetland crosses the Sander East site and may be considered jurisdictional. Other unvegetated drainages may occur at the other sites. A formal jurisdictional delineation was not conducted for any of the other sites and would be needed to assess whether the areas contain any jurisdictional waters or wetlands that would be under the jurisdiction of USACE, RWQCB, and/or CDFW.

CONCLUSION

Ten sensitive vegetation communities occur within the Pueblo North, MCAS Miramar, and Mast Boulevard sites (chamise chaparral, coast live oak woodland, coastal sage-chaparral scrub transition, Diegan coastal sage scrub, Diegan coastal sage scrub: baccharis-dominated, native grassland, non-native grassland, scrub oak chaparral, southern mixed chaparral, and vernal pool) and six occur within the Pueblo Central, Pueblo South, and Sander East sites (native grassland, Diegan coastal sage scrub, Diegan coastal sage scrub: baccharis-dominated, non-native grassland, chamise chaparral, and scrub oak chaparral). All potential basins that ponded on all six sites were surveyed and sampled for fairy shrimp species and San Diego fairy shrimp was documented within the MCAS Miramar, Sander East, and Pueblo South sites. The basins that were determined to meet the City's definition of City vernal pools (based on the presence of vernal pool indicator plant species) included 7 at Pueblo North, 21 at MCAS Miramar, 0 at Mast Boulevard, 6 at Pueblo Central, 6 at Pueblo South, and 21 at Sander East. Eight low sensitivity rare plant species were found at the sites (Orcutt's brodiaea, long-spined spineflower, San Diego barrel cactus, Nuttall's scrub oak, ashy spike-moss, San Diego county viguiera, San Diego

sagewort, and graceful tarplant). Six sensitive animal species were observed or detected within the sites (white-tailed kite, coastal California gnatcatcher, Belding's orange-throated whiptail, two-striped garter snake, western spadefoot, and San Diego fairy shrimp).

Please do not hesitate to call either of us at (619) 462-1515 if you have any questions.

Sincerely,

Summer Schlageter
Biologist

Shelby Howard
Principal Biologist

Enclosures:

Figure 1	Regional Location Map
Figures 2a - d	Project Vicinity (USGS Topography)
Figure 3	Aerial with MHPA
Figures 4a – f	Vegetation
Figures 5a – e	Special Status Species
Figures 6a – f	Wet Season Fairy Shrimp Survey Results
Figure 7	Basins Previously Mapped by MCAS Miramar
Figures 8a - c	MCAS Miramar Jurisdictional Information
Attachment A	Plant Species Observed
Attachment B	Animal Species Observed or Detected

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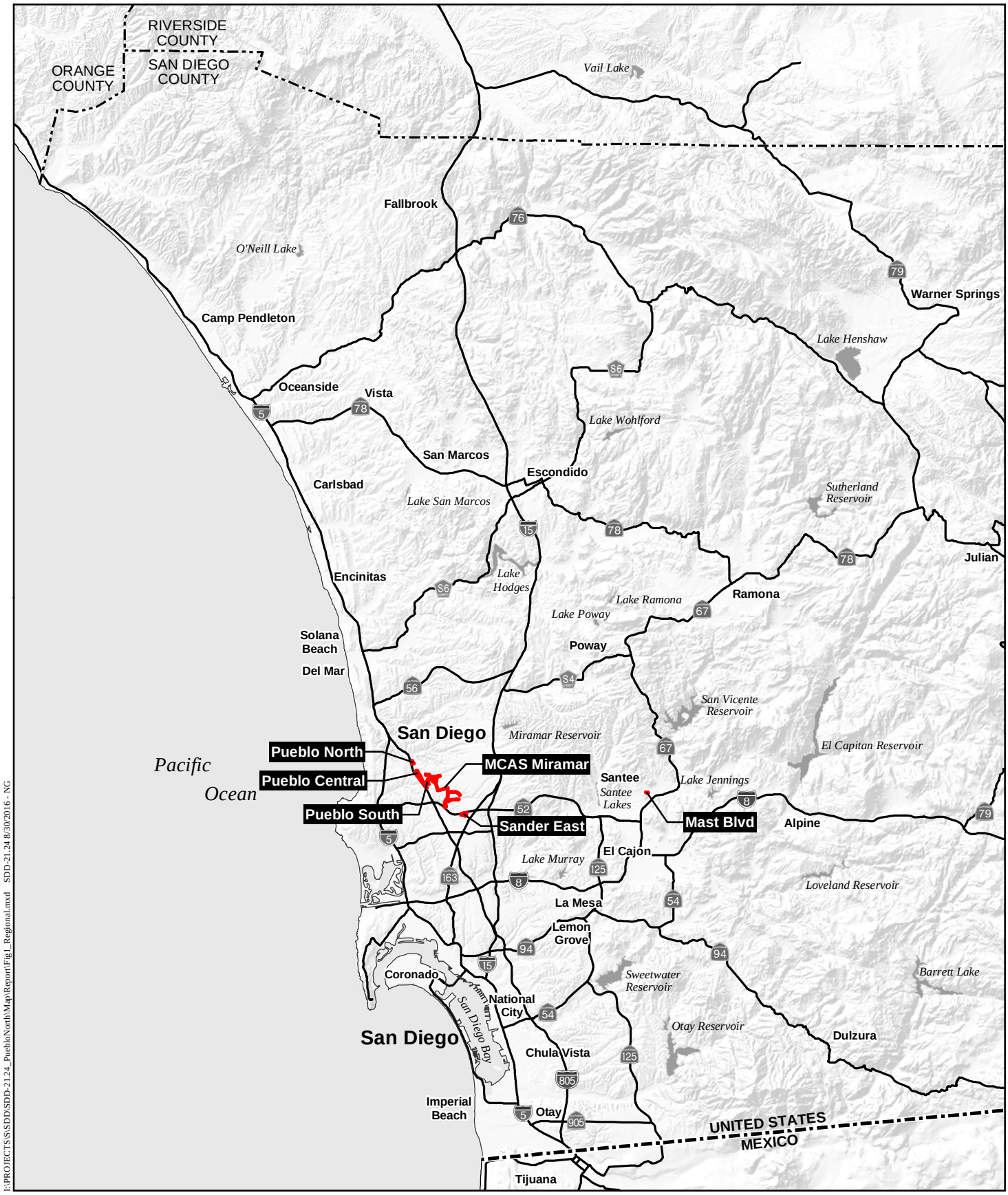

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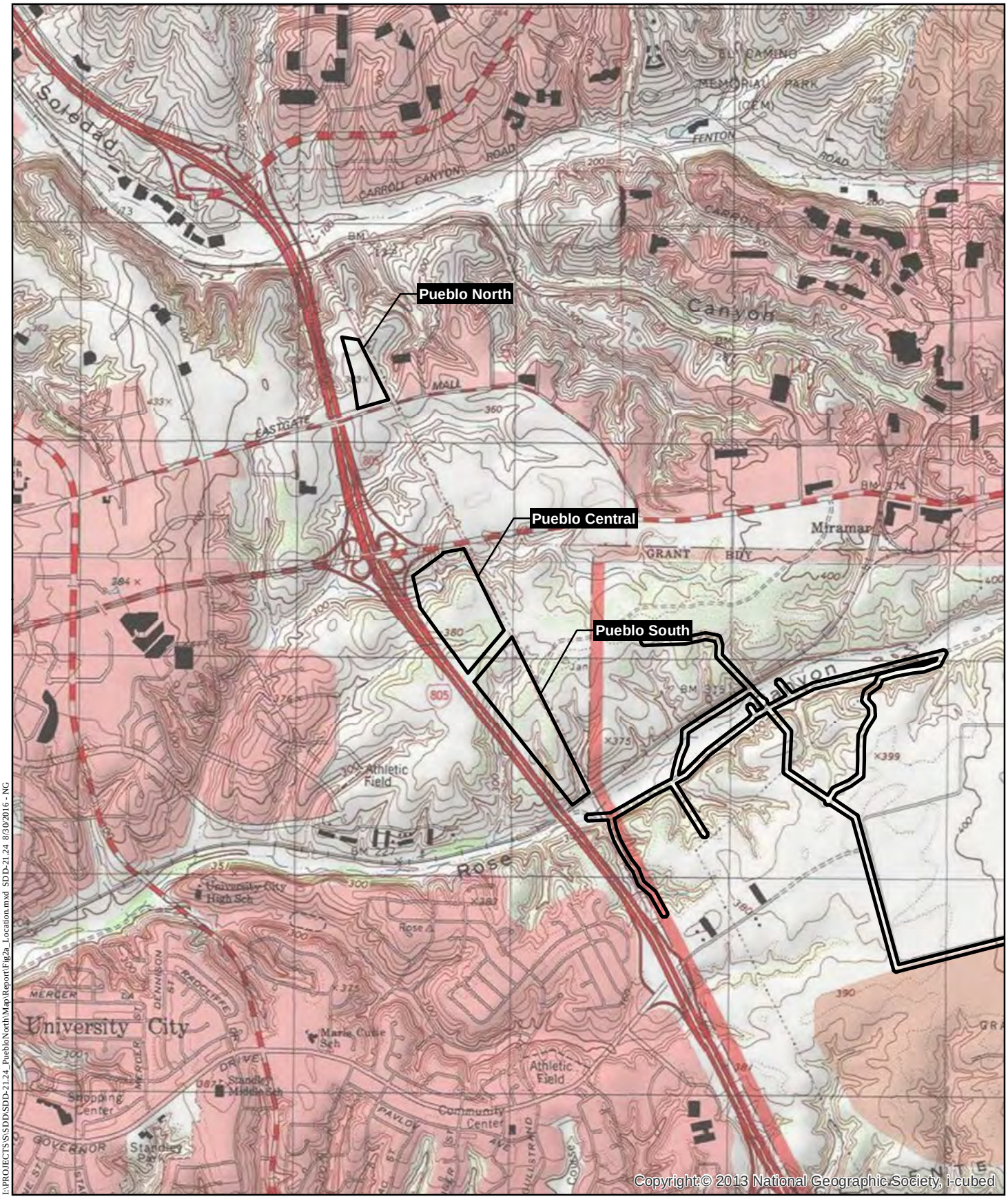
Regional Location Map

PURE WATER

HELIX Environmental Planning

N 0 8 Miles

Figure 1



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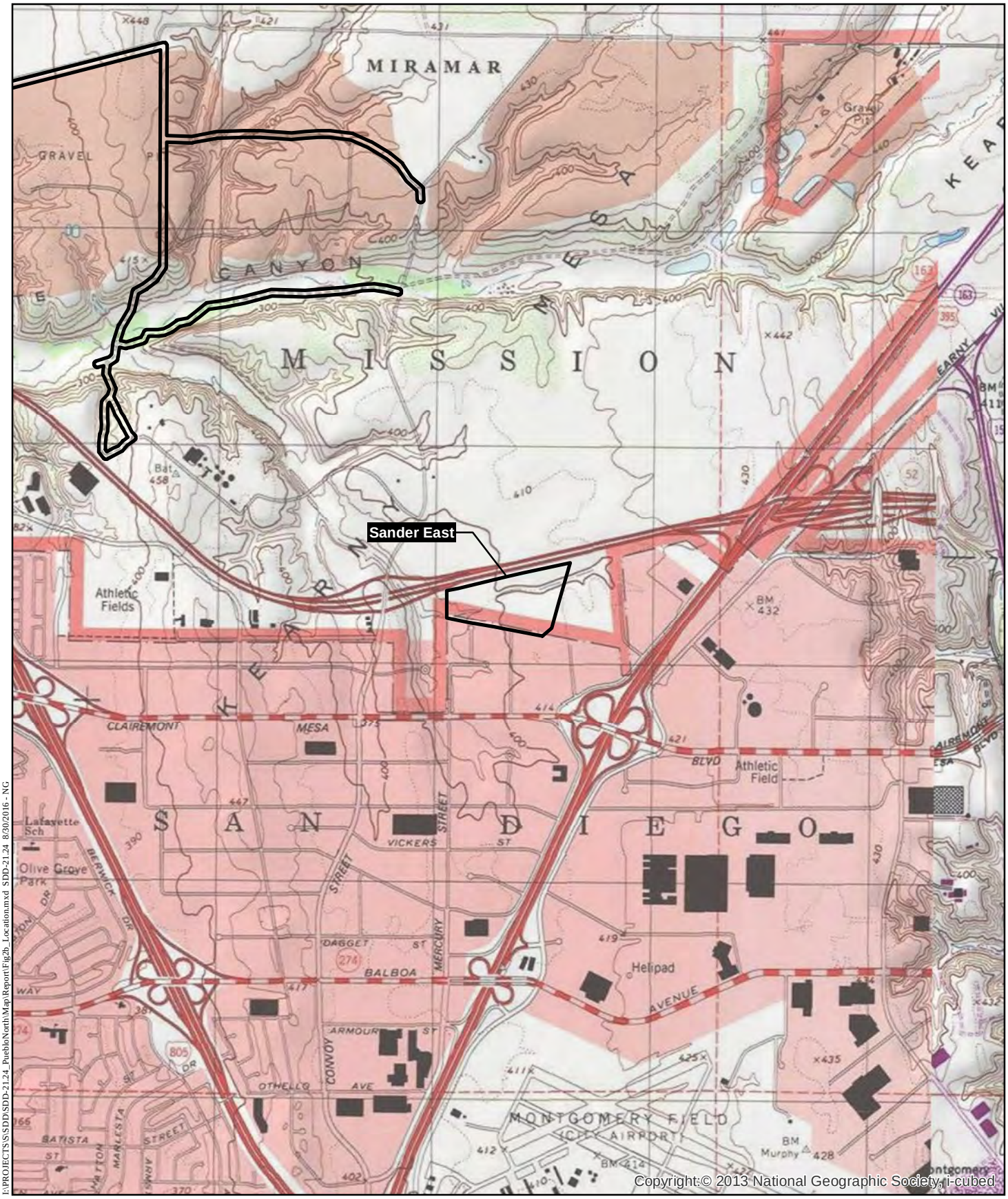
Site Locations

PURE WATER

HELIX Environmental Planning

N 0 2,000 Feet

Figure 2a



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Site Locations

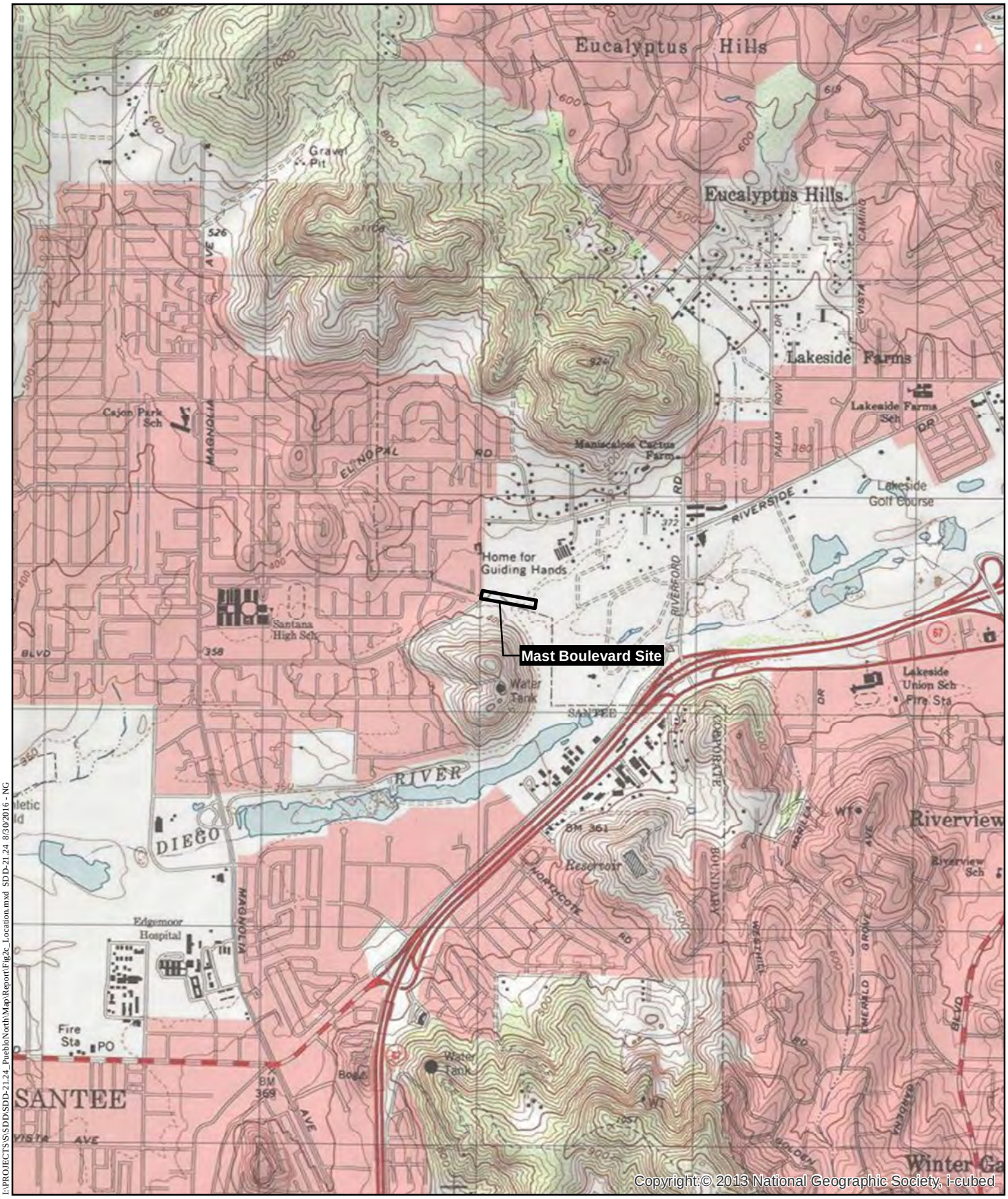
PURE WATER

HELIX Environmental Planning

N

0 2,000 Feet

Figure 2b



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Site Locations

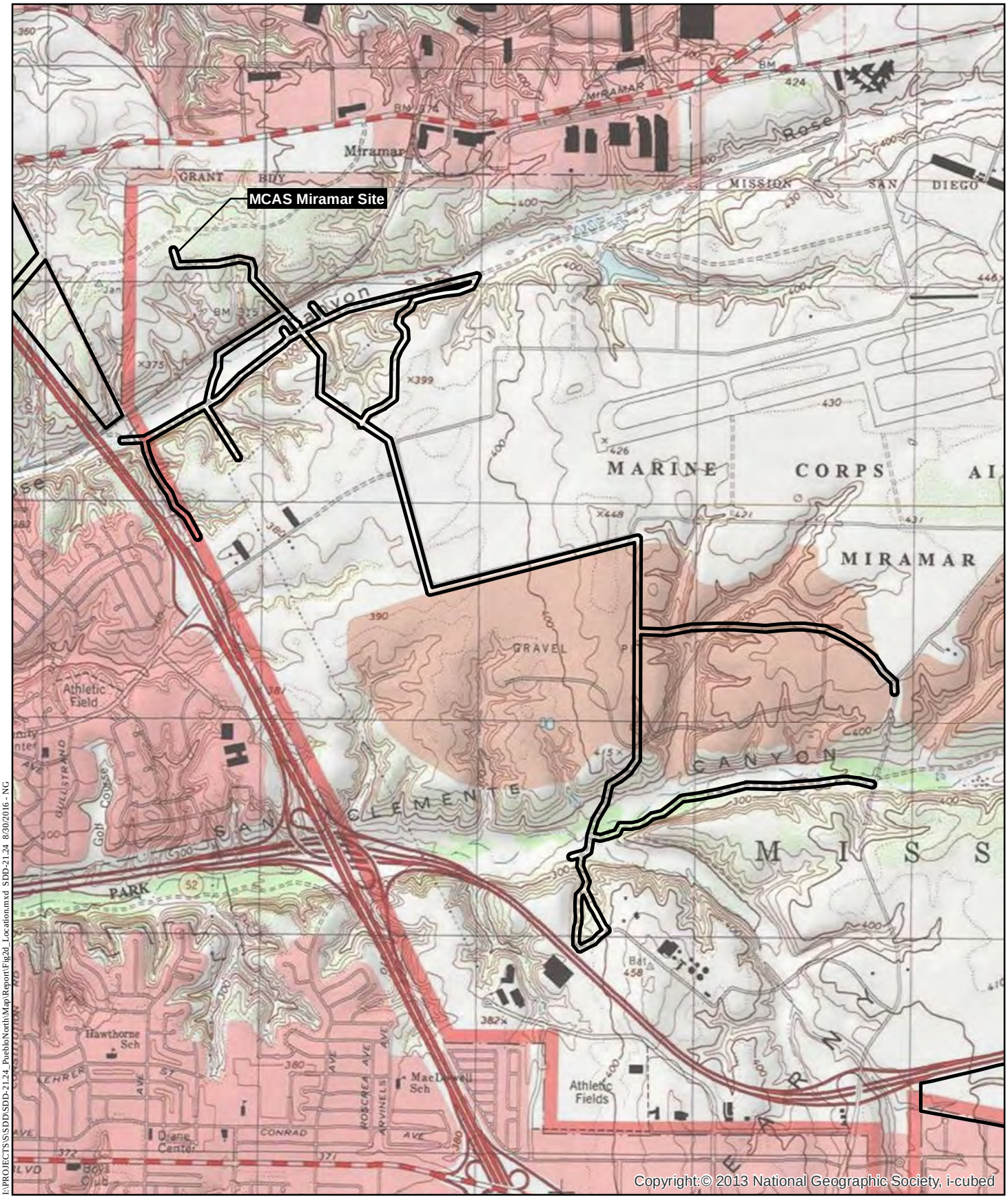
PURE WATER

HELIX Environmental Planning

N

0 2,000 Feet

Figure 2c



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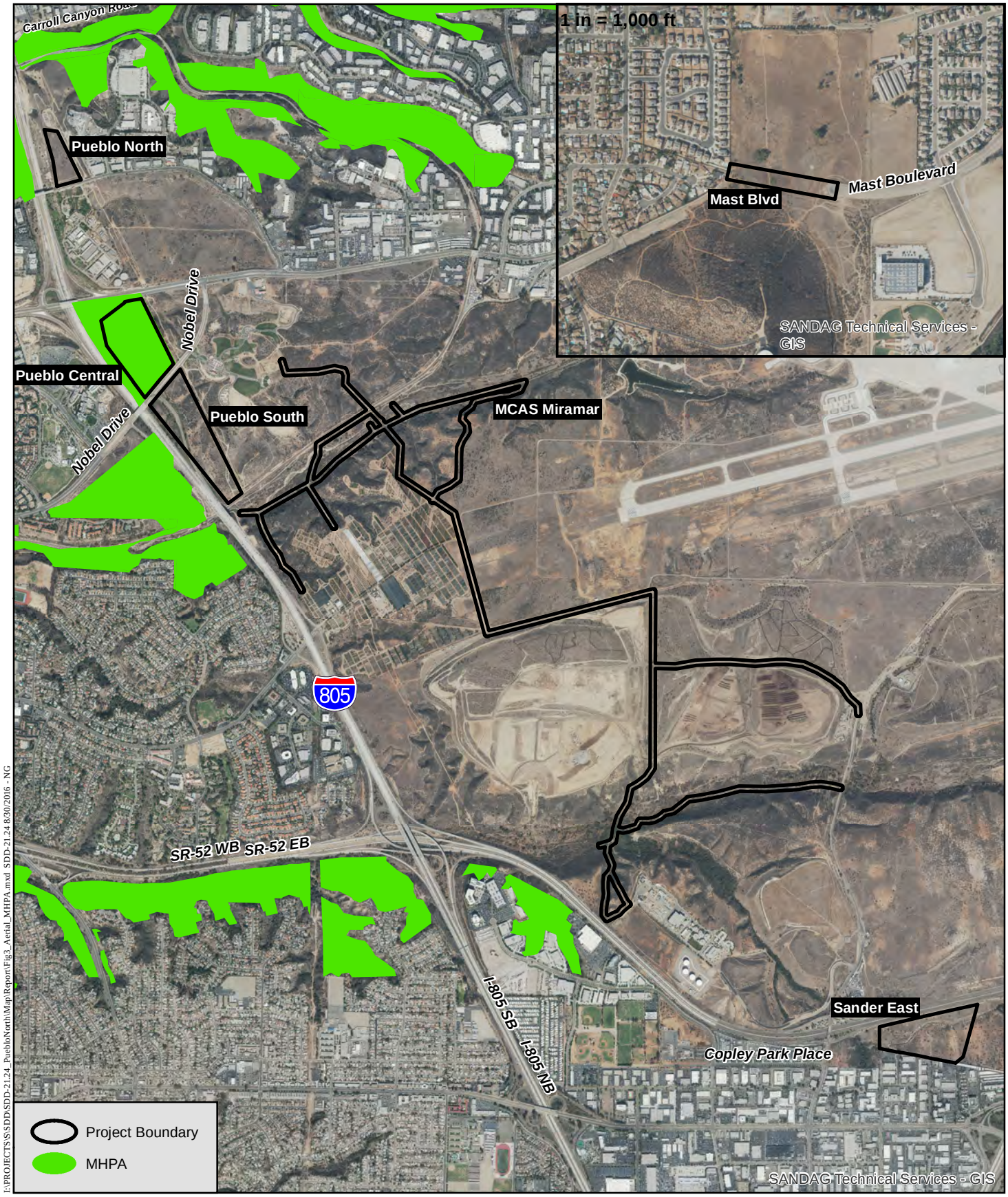
Site Locations

PURE WATER

HELIX Environmental Planning

N 0 2,000 Feet

Figure 2d



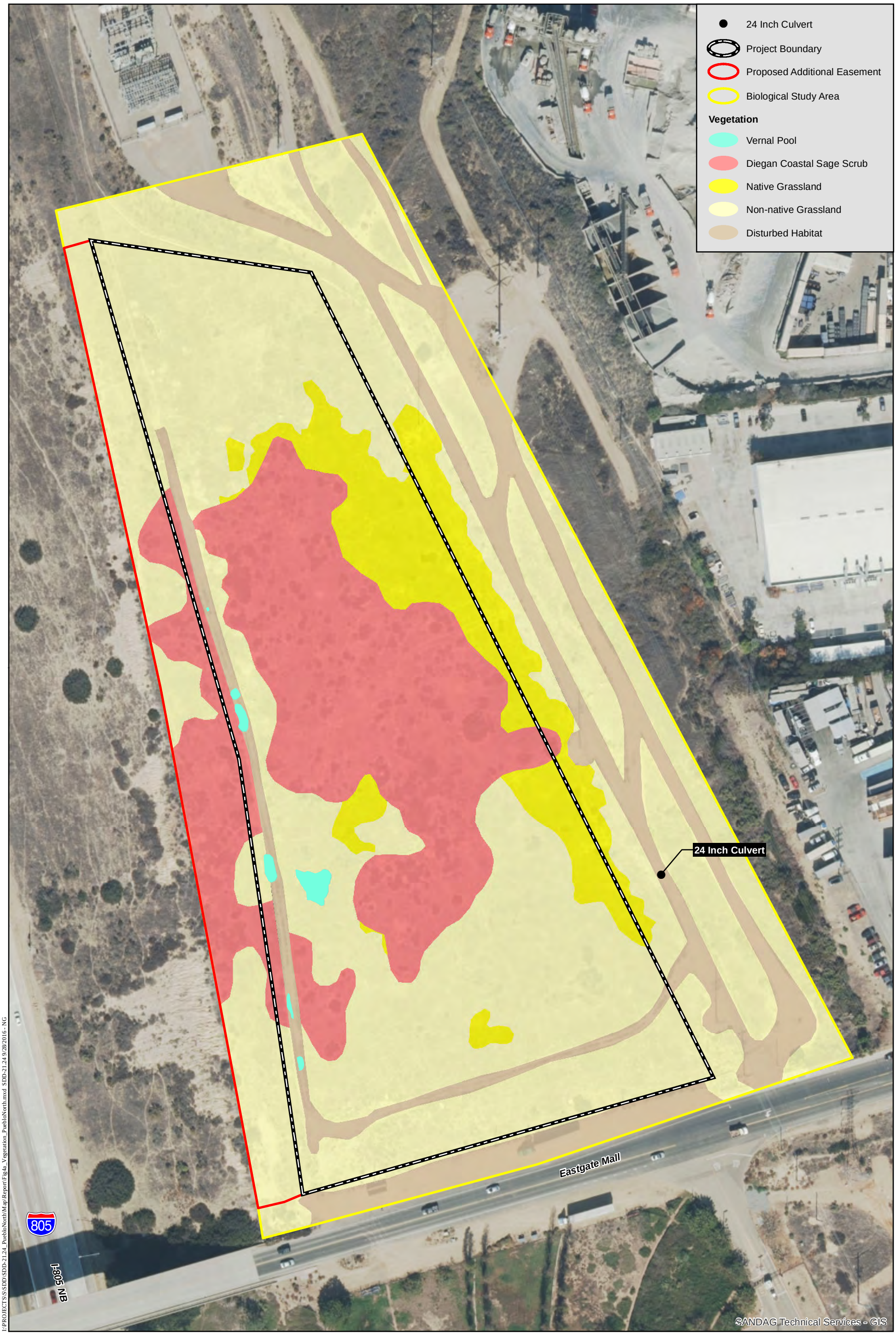
Project Vicinity (Aerial Photograph)

PUEBLO NORTH

HELIX Environmental Planning

N 0 2,500 Feet

Figure 3



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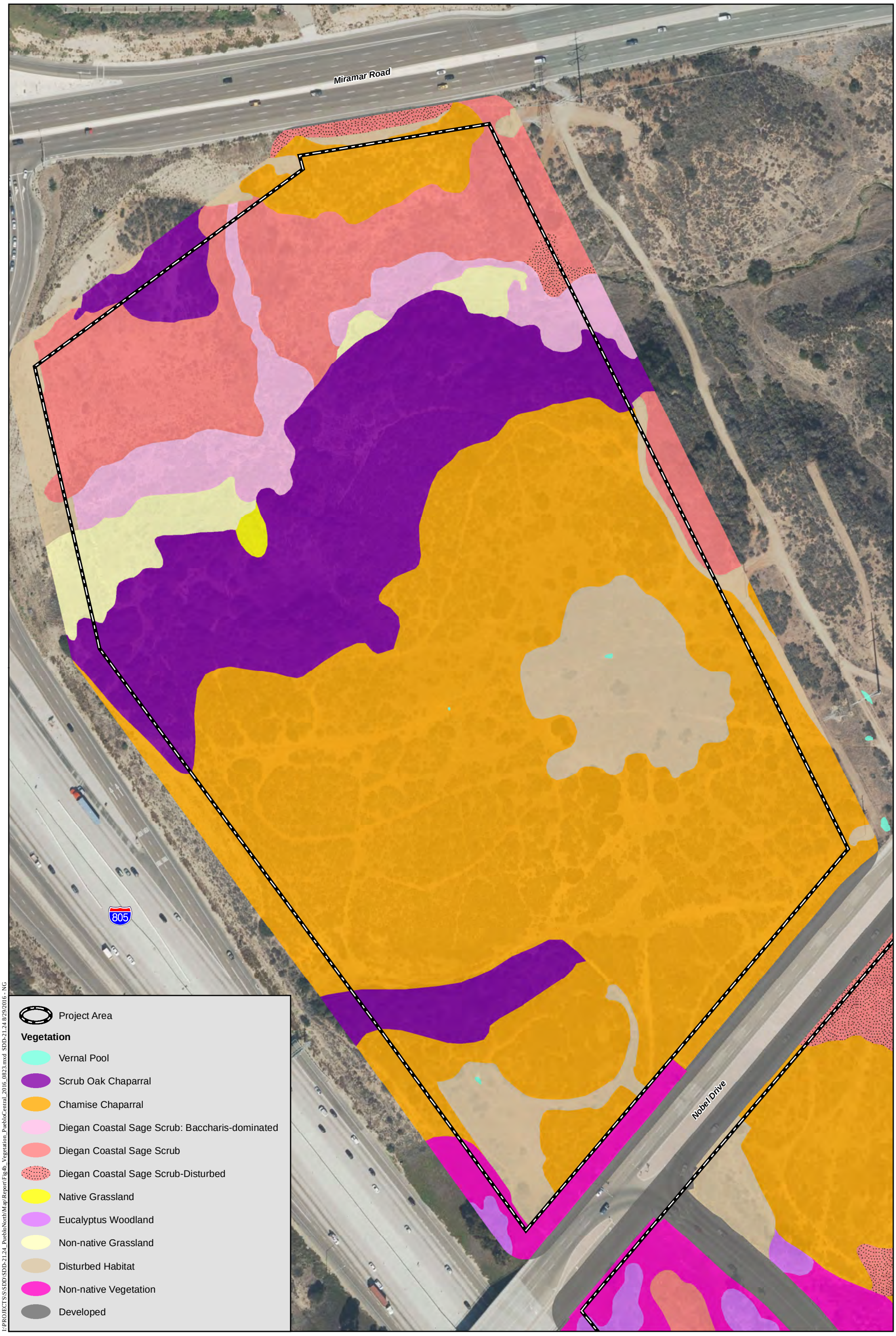
Vegetation - Pueblo North

PURE WATER

HELIX Environmental Planning

N 0 100 Feet

Figure 4a



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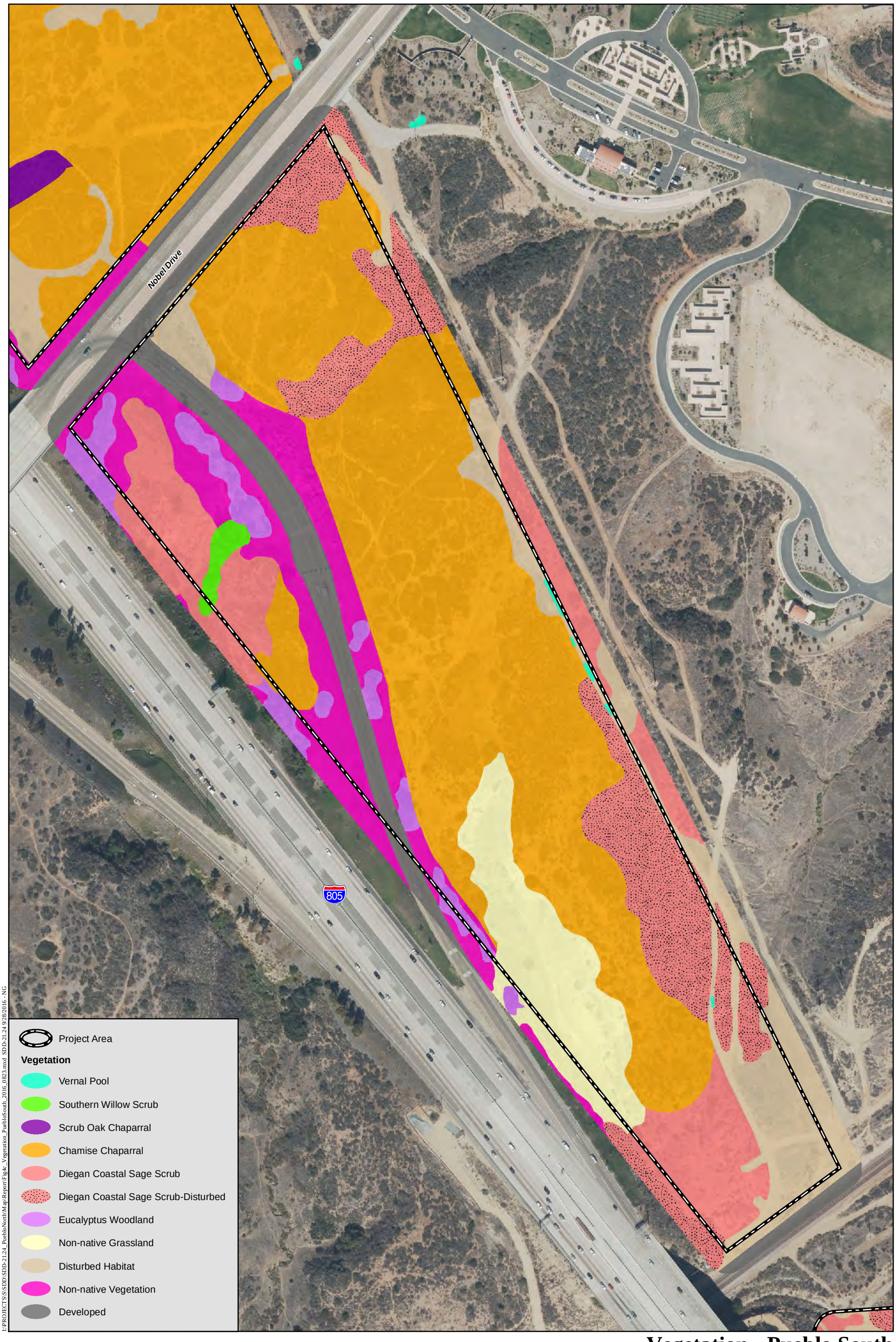
Vegetation - Pueblo Central

PURE WATER

HELIX Environmental Planning

N 0 150 Feet

Figure 4b



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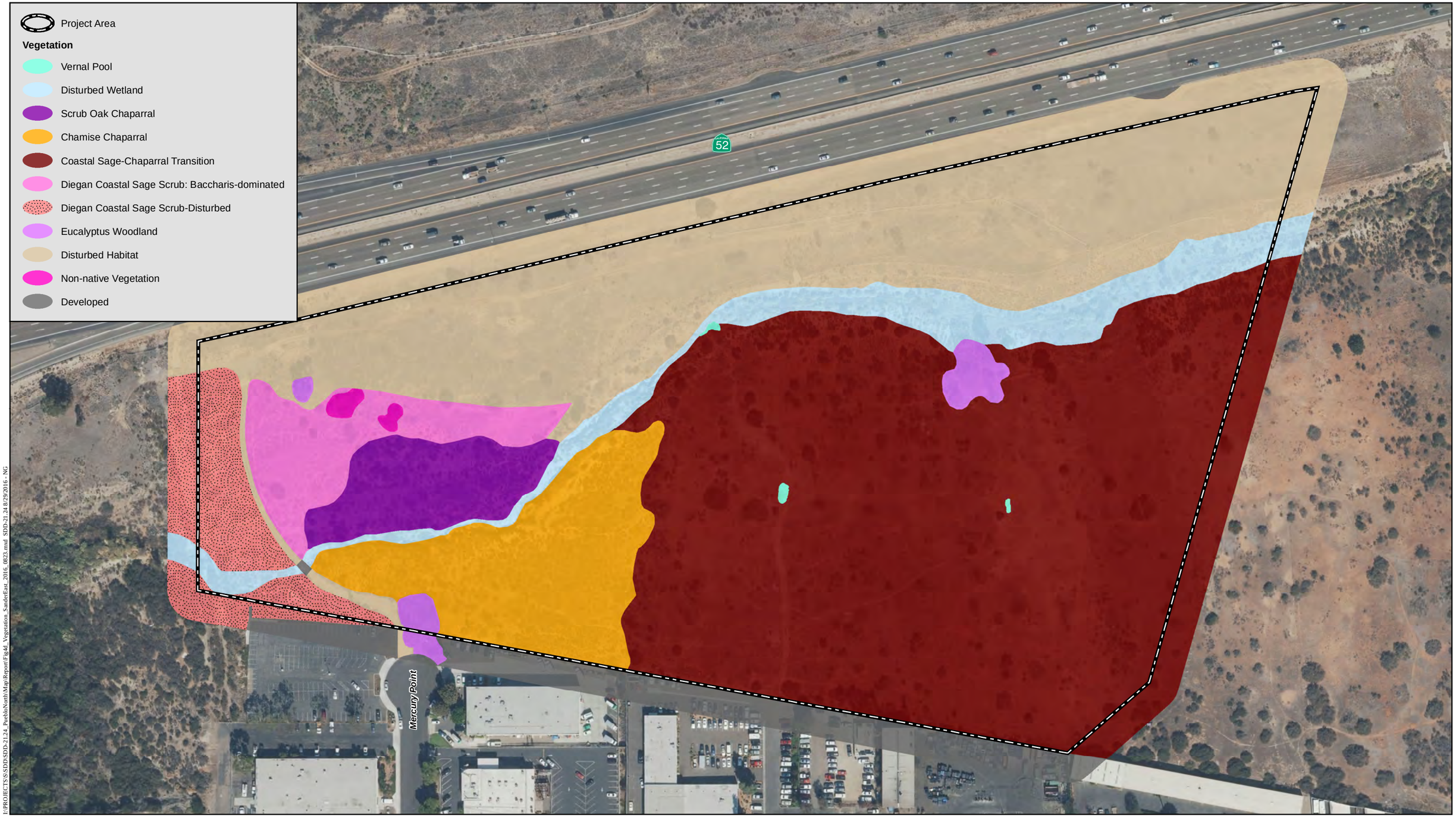
Vegetation - Pueblo South

PURE WATER

HELIX Environmental Planning

N 0 200 Feet

Figure 4c



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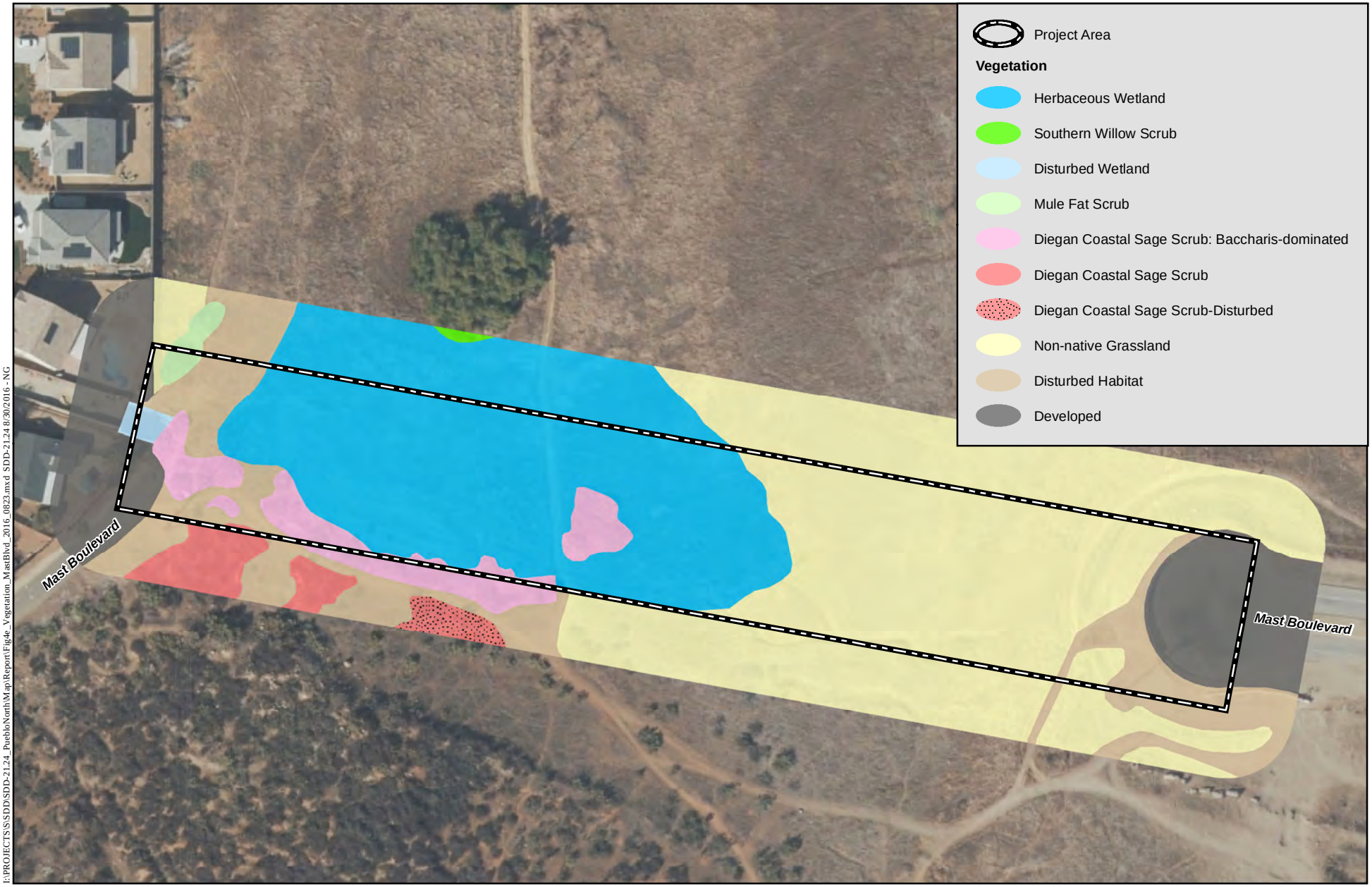
Vegetation - Sander East

PURE WATER

HELIX Environmental Planning

0 150 Feet

Figure 4d



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Vegetation - Mast Boulevard

PURE WATER

HELIX Environmental Planning

N 0 100 Feet

Figure 4e

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Vegetation - MCAS Miramar

PURE WATER

HELIX Environmental Planning

N 0 200 Feet

Figure 4f-1

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Vegetation - MCAS Miramar

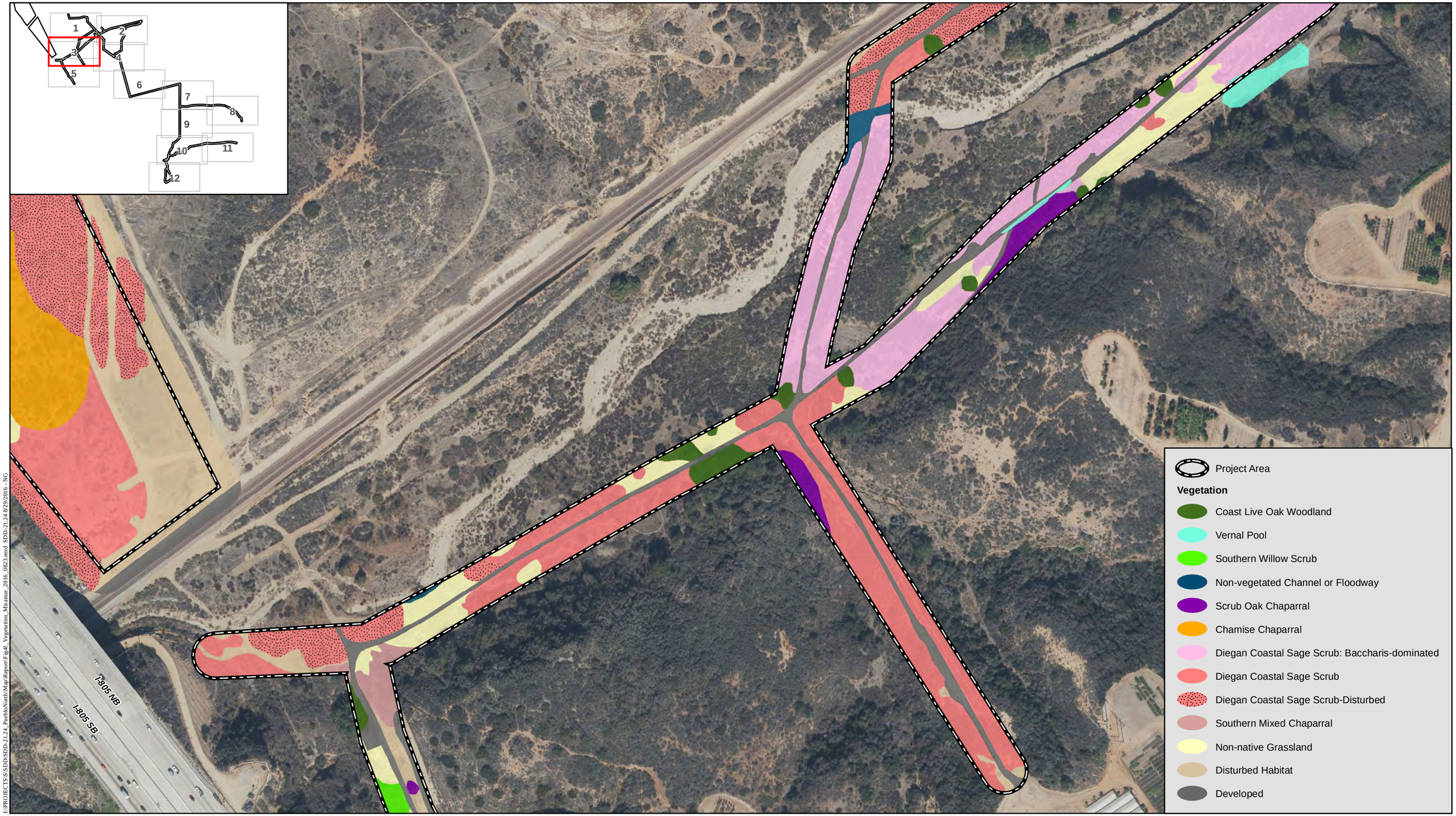
PURE WATER

HELIX Environmental Planning

N

0 200 Feet

Figure 4f-2



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Vegetation - MCAS Miramar

PURE WATER

HELIX Environmental Planning

N 0 200 Feet

Figure 4f-3

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Vegetation - MCAS Miramar

PURE WATER

HELIX Environmental Planning

Figure 4f-4

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Vegetation - MCAS Miramar

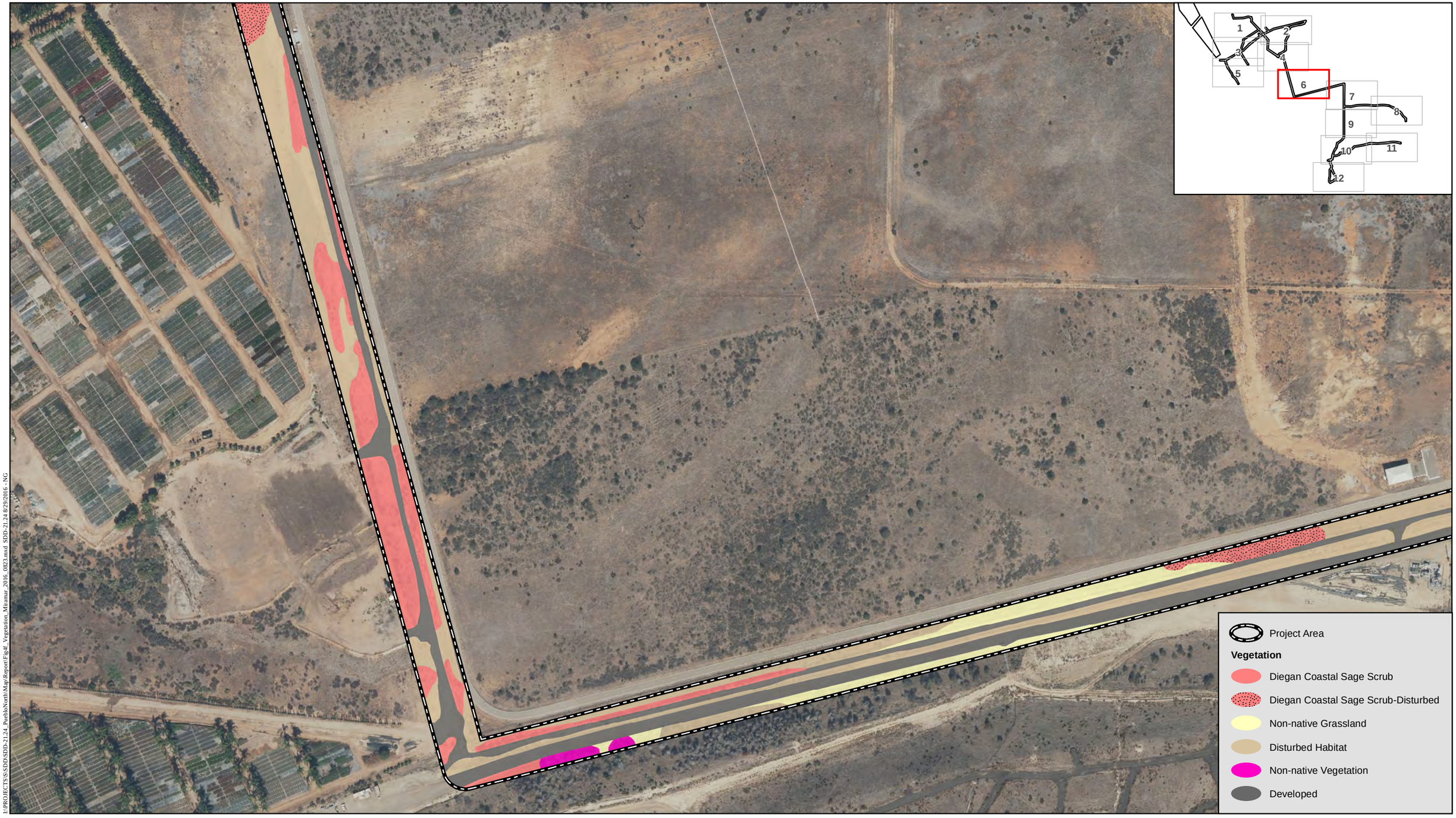
PURE WATER

HELIX Environmental Planning

N

0 200 Feet

Figure 4f-5



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Vegetation - MCAS Miramar

PURE WATER

HELIX Environmental Planning

N 0 200 Feet

Figure 4f-6

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Vegetation - MCAS Miramar

PURE WATER

HELIX Environmental Planning

Figure 4f-7

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Vegetation - MCAS Miramar

PURE WATER

HELIX Environmental Planning

0 200 Feet

Figure 4f-8

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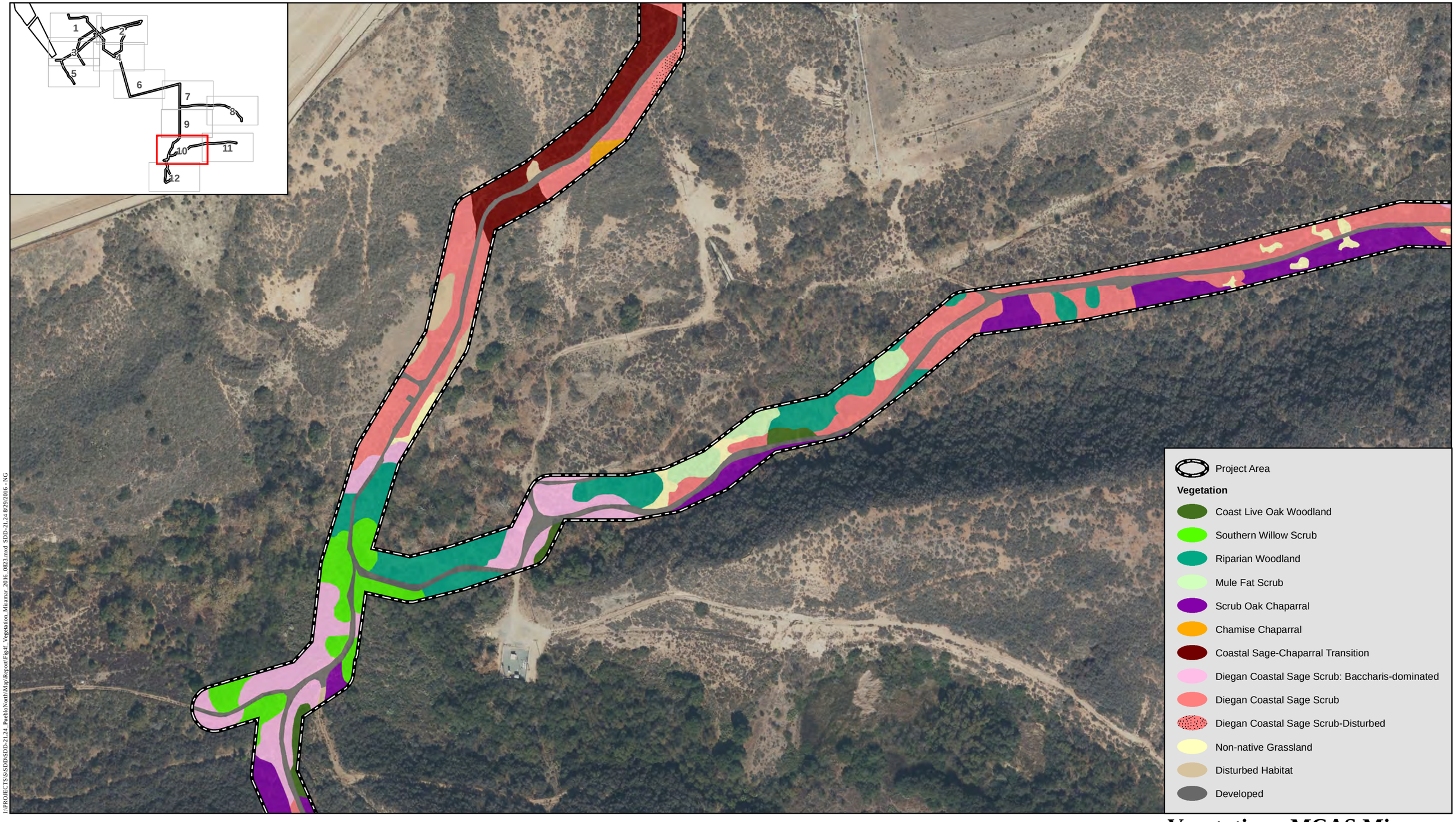
Vegetation - MCAS Miramar

PURE WATER

HELIX Environmental Planning

Figure 4f-9



Vegetation - MCAS Miramar

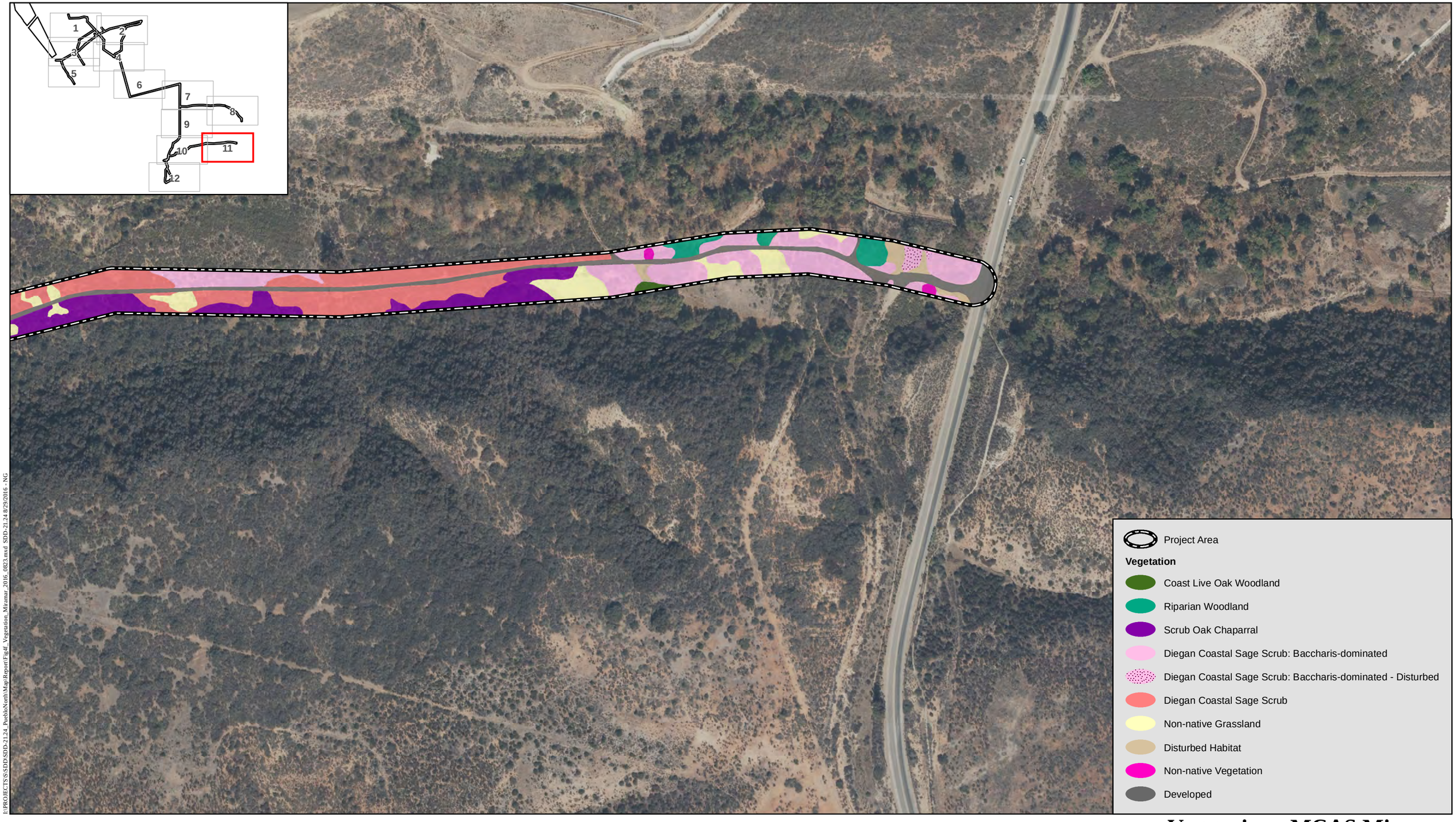
PURE WATER

HELIX Environmental Planning

N

0 200 Feet

Figure 4f-10



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Vegetation - MCAS Miramar

PURE WATER

HELIX Environmental Planning

N

0 200 Feet

Figure 4f-11

Vegetation - MCAS Miramar

PURE WATER

HELIX Environmental Planning

0 200 Feet

Figure 4f-12

I:\PROJECTS\SDDSDD-21.24_PuebloNorth\Map\Report\Fig5a_PuebloNorth_SpecialStatus.mxd SDD-21.24 8/18/2016 - NG

2016 Special Status Species - Pueblo North

PURE WATER

HELIX Environmental Planning

N 0 150 Feet

Figure 5a

I:\PROJECTS\SDD\SDD-21.24_PuebloNorth\Map\Report\Fig5b_PuebloCentral_SpecialStatus.mxd SDD-21.24 8/23/2016 - NG

2016 Special Status Species - Pueblo Central

PURE WATER

HELIX Environmental Planning

N 0 220 Feet

Figure 5b

I:\PROJECTS\SDD\SDD-21.24_PuebloNorth\Map\Report\Fig5c_PuebloSouth_SpecialStatus.mxd SDD-21.24 8/23/2016 - NG

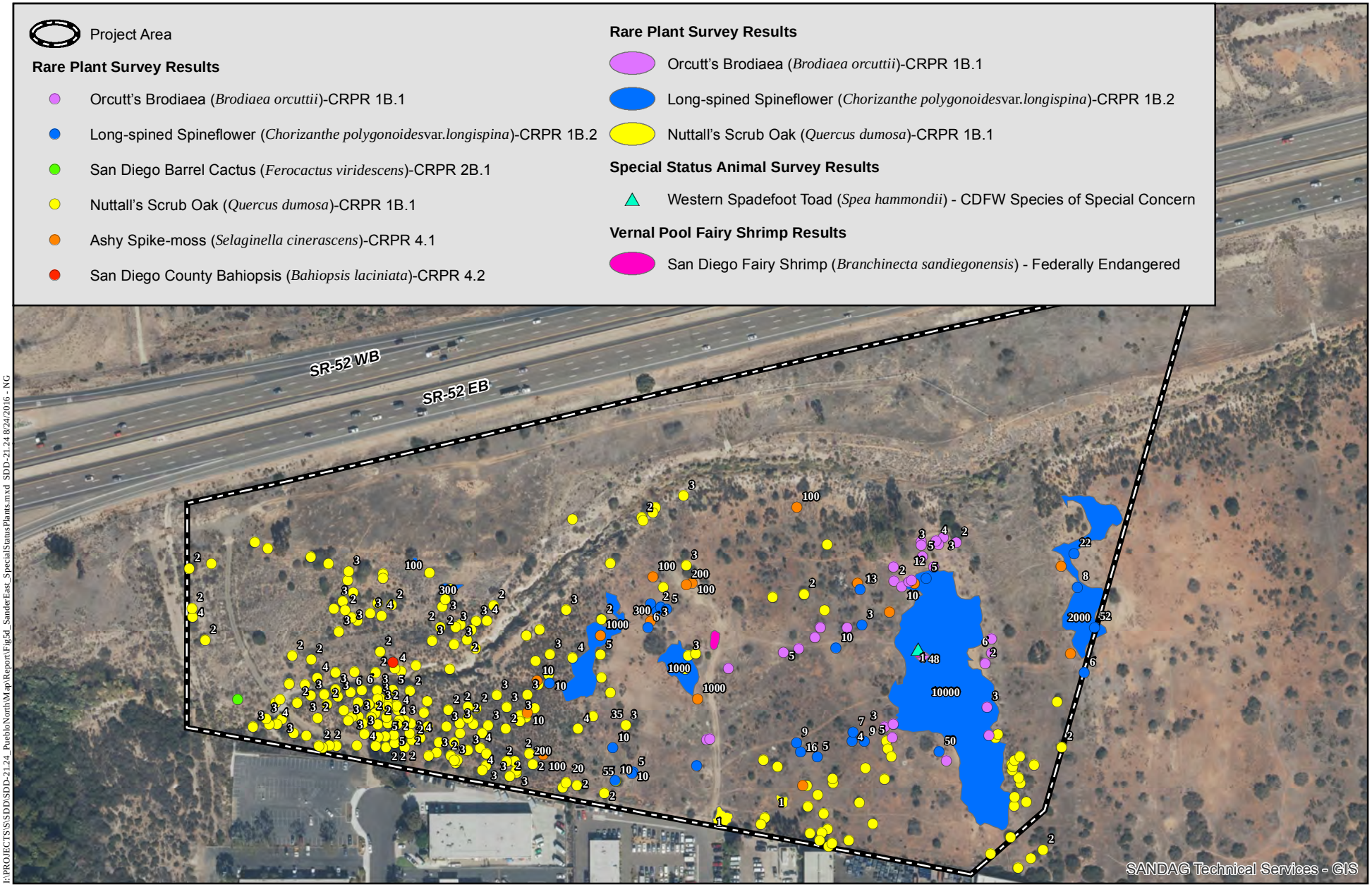
2016 Special Status Species - Pueblo South

PURE WATER

HELIX Environmental Planning

N 0 300 Feet

Figure 5c



2016 Special Status Species - Sander East

PURE WATER

HELIX Environmental Planning

N 0 250 Feet

Figure 5d

I:\PROJECTS\S\SDD\SDD-21.24_PuebloNorthMap\Report\Fig5e_MastBlvd_SpecialStatus.mxd SDD-21.24 8/31/2016 - NG

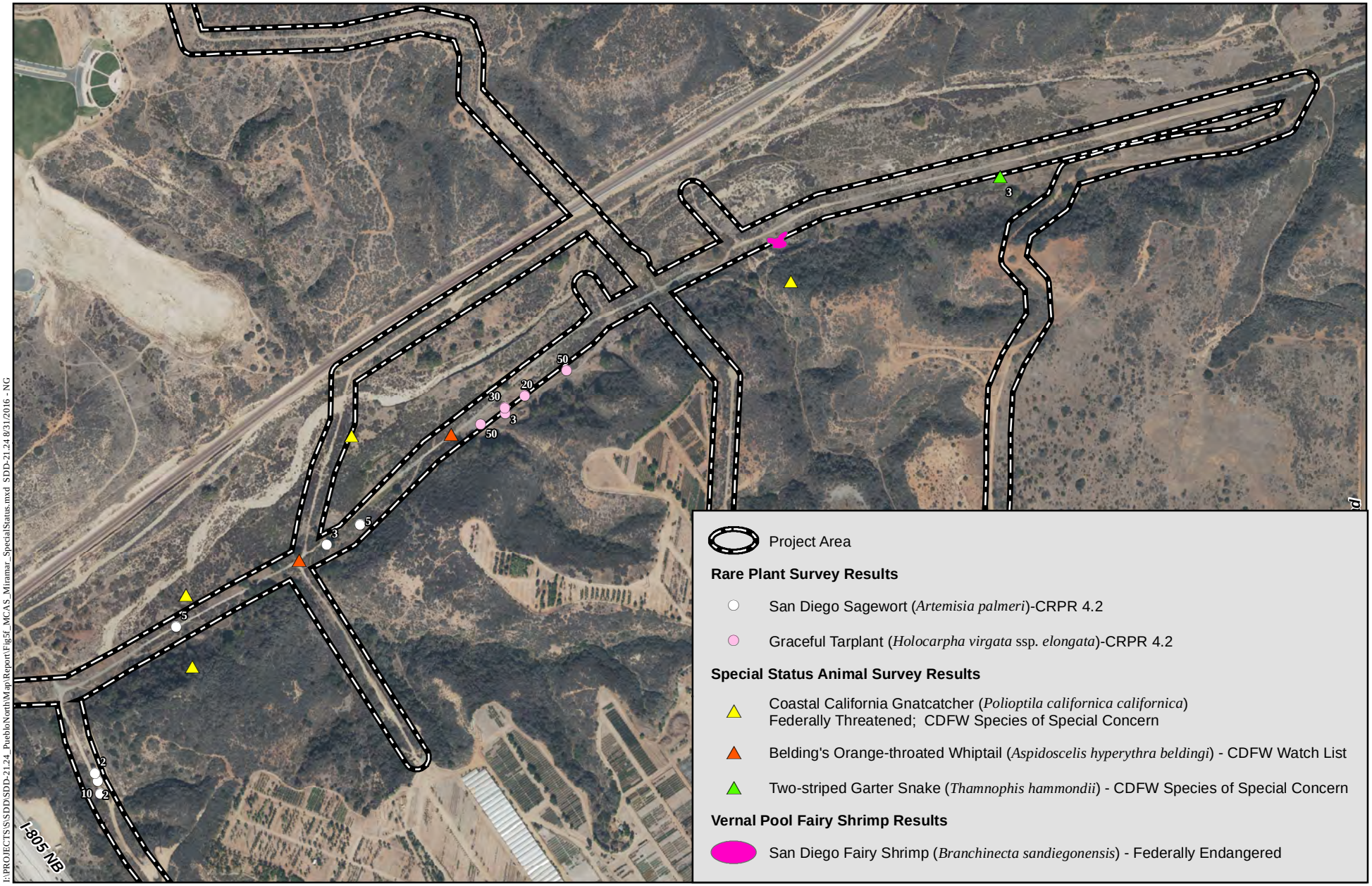
2016 Special Status Species - Mast Boulevard

PURE WATER

HELIX Environmental Planning

N 0 100 Feet

Figure 5e



I:\PROJECTS\S\SDD\SDD-21.24_PuebloNorthMap\Report\Fig5f_MCAS_Miramar_SpecialStatus.mxd SDD-21.24 8/31/2016 - NG

2016 Special Status Species - MCAS Miramar

PURE WATER

HELIX Environmental Planning

N 0 550 Feet

Figure 5f

I:\PROJECTS\S\SDD\SDD-21.24_PuebloNorthMap\Report\Fig6a_SanderEast.mxd SDD-21.24 9/28/2016 - NG

2016 Wet Season Fairy Shrimp Survey - Sander East

PURE WATER

HELIX Environmental Planning

N 0 200 Feet

Figure 6a

I:\PROJECTS\SSDD\SDD-21.24_PuebloNorthMap\Report\Fig6b_MCAS_Miramar.mxd SDD-21.24 9/28/2016 - NG

2016 Wet Season Fairy Shrimp Survey - MCAS Miramar

PURE WATER

HELIX Environmental Planning

N 0 550 Feet

Figure 6b

I:\PROJECTS\SSDD\SDD-21.24_PuebloNorthMap\Report\Fig6c_MastBlvd.mxd SDD-21.24 9/28/2016 - NG

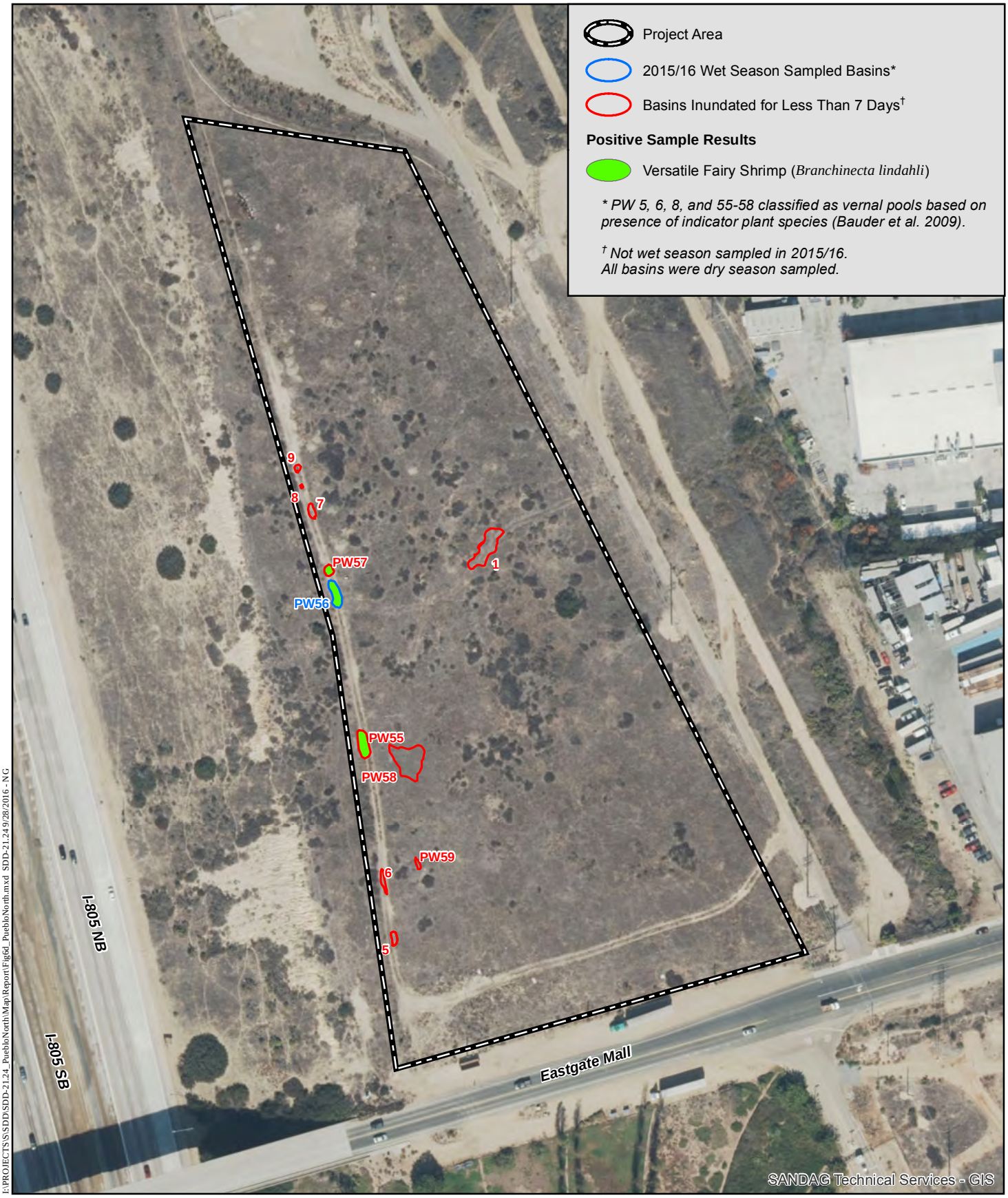
2016 Wet Season Fairy Shrimp Survey - Mast Boulevard

PURE WATER

HELIX Environmental Planning

N 0 100 Feet

Figure 6c



I:\PROJECTS\SDDSDD-21.24_PuebloNorth\Map\Report\Fig6d_PuebloNorth.mxd SDD-21.24 9/28/2016 - NG

2016 Wet Season Fairy Shrimp Survey - Pueblo North

PURE WATER

HELIX Environmental Planning

N 0 150 Feet

Figure 6d

I:\PROJECTS\SDDSDD-21.24_PuebloNorth\Map\Report\Fig6e_PuebloCentral.mxd SDD-21.24 9/28/2016 - NG

2016 Wet Season Fairy Shrimp Survey - Pueblo Central

PURE WATER

HELIX Environmental Planning

N 0 220 Feet

Figure 6e

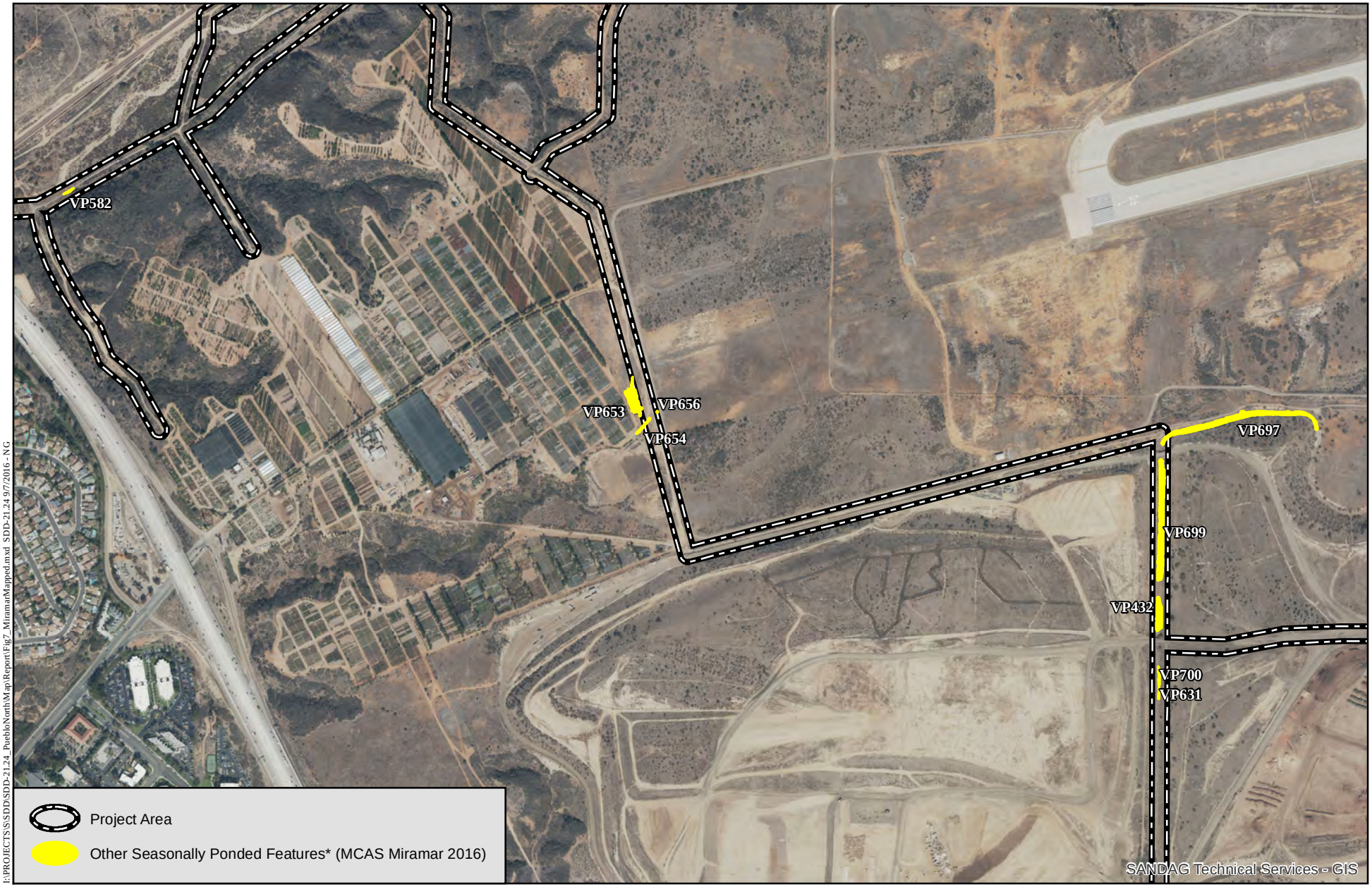
2016 Wet Season Fairy Shrimp Survey - Pueblo South

PURE WATER

HELIX Environmental Planning

N 0 300 Feet

Figure 6f



I:\PROJECTS\S\SDD\SDD-21.24_PuebloNorthMap\Report\Fig7_MiramarMapped.mxd SDD-21.24 9/7/2016 - NG

* Labels refer to MCAS Miramar's basin ID numbers

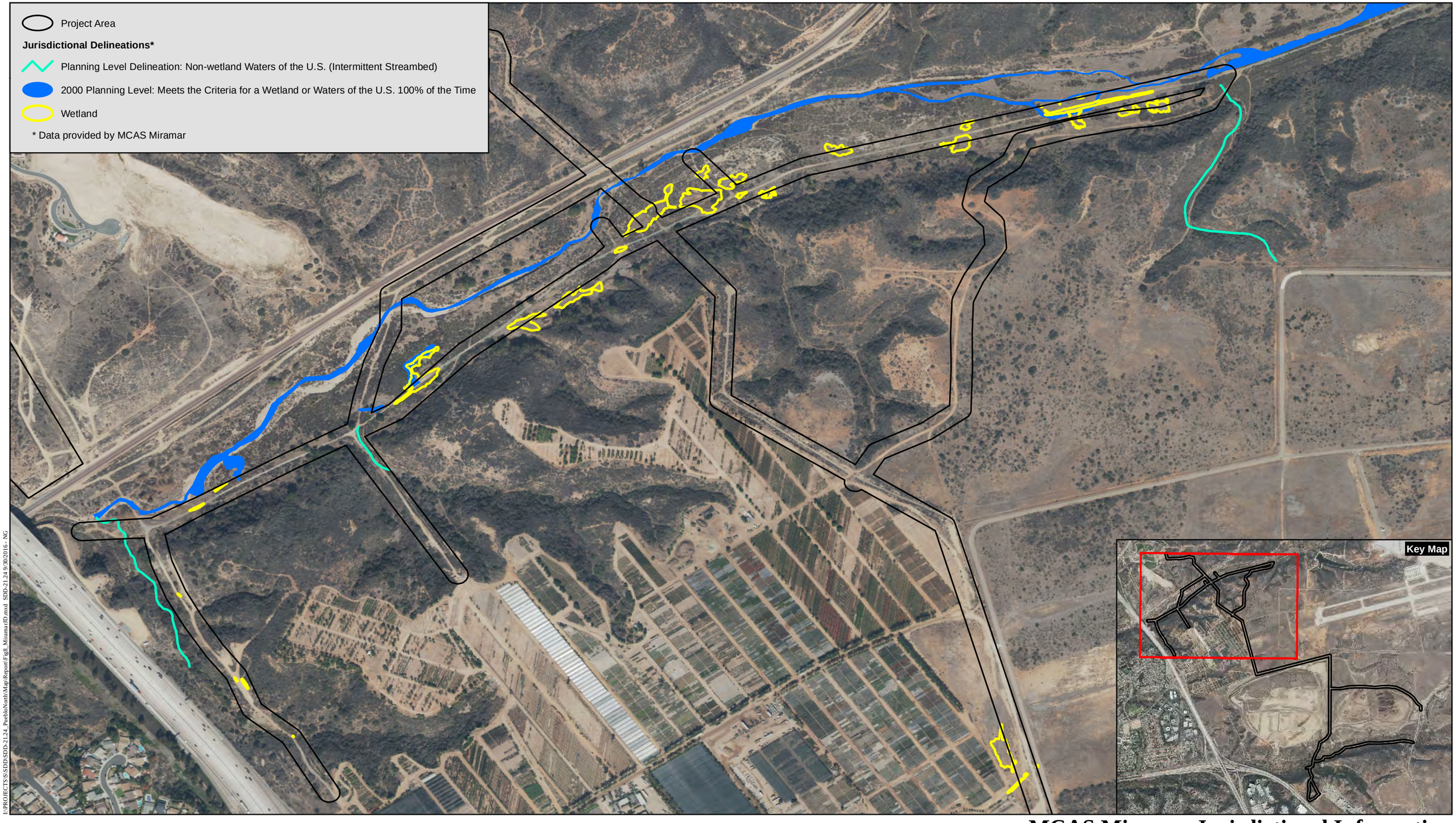
Basins Previously Mapped by MCAS Miramar

PURE WATER

HELIX Environmental Planning

N 0 900 Feet

Figure 7



I:\PROJECTS\SDP\SDD-21.24_PuebloNorth\Map\Report\Fig8_MiramarJD.mxd SDD-21.24 9/30/2016 - NG

MCAS Miramar Jurisdictional Information

HELIX Environmental Planning

N 0 500 Feet

PURE WATER

Figure 8a

I:\PROJECTS\SDD\SDD-21.24_PuebloNorth\Map\Report\Fig8_MiramarJD.mxd SDD-21.24 9/30/2016 - NG

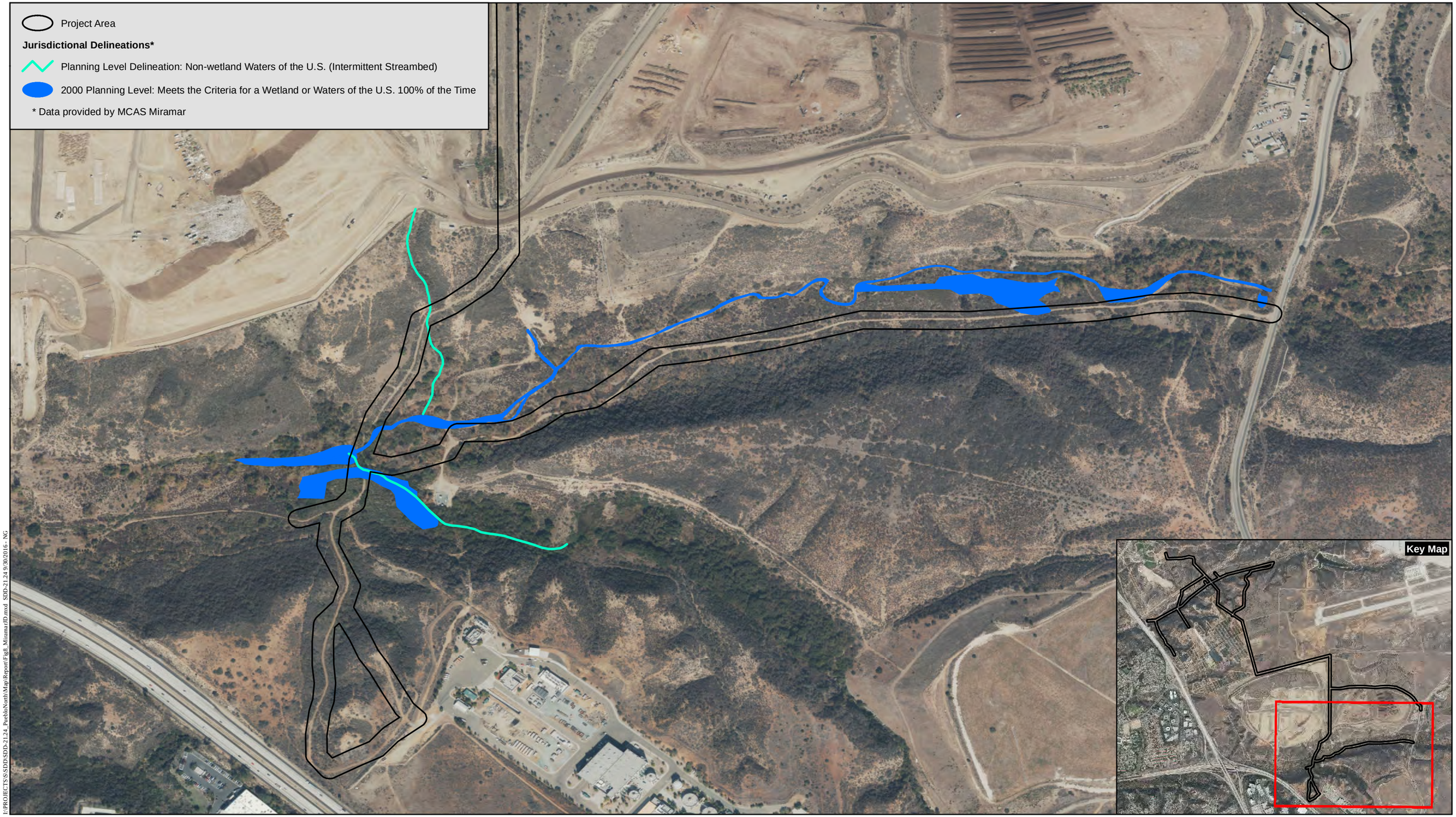
MCAS Miramar Jurisdictional Information

PURE WATER

HELIX Environmental Planning

0 500 Feet

Figure 8b



I:\PROJECTS\SDD\SDD-21\24_PuebloNorth\Map\Report\Fig8_MiramarID.mxd SDD-21 24 9/30/2016 - NG

MCAS Miramar Jurisdictional Information

HELIX Environmental Planning

0 500 Feet

PURE WATER

Figure 8c

Attachment A
PLANT SPECIES OBSERVED

Family	Scientific Name	Common Name
Adoxaceae	*Sambucus nigra*	blue elderberry
Agavaceae	*Chlorogalum parviflorum*	small-flower soap-plant
	Yucca schidigera	Mohave Yucca
Aizoaceae	*Carpobrotus edulis**	hottentot-fig
	*Mesembryanthemum nodiflorum**	slender leaved ice plant
Anacardiaceae	*Malosma laurina*	laurel sumac
	Rhus integrifolia	lemonadeberry
	*Schinus terebinthifolius**	Brazilian Pepper tree
	Toxicodendron diversilobum	Western poison-oak
Apiaceae	*Daucus pusillus*	rattlesnake weed
Apocynaceae	*Asclepias californica*	California milkweed
Asteraceae	*Ambrosia psilostachya*	western ragweeed
	Artemisia californica	California sagebrush
	Artemisia palmeri†	Palmer's sagewort
	Baccharis pilularis	coyote bush
	Baccharis sarothroides	broom baccharis
	*Centaurea melitensis**	tocalote
	Corethrogyne filaginifolia var. *filaginifolia*	California sand-aster
	Deinandra fasciculata	clustered tarweed
	*Dittrichia graveolens**	stinkwort
	*Erigeron bonariensis**	flax-leaf fleabane
	Erigeron canadensis	Canada horseweed
	Eriophyllum confertiflorum var. *confertiflorum*	long-stem golden-yarrow
	*Glebionis coronaria**	crown daisy
	Hazardia squarrosa var. *grindelioides*	Southern sawtooth goldenbush
	Heterotheca grandiflora	telegraph weed
	Holocarpha virgata ssp. *elongata*†	graceful tarplant
	Hypochaeris glabra	smooth cat's ear
	Isocoma menziesii var. *menziesii*	Menzies' goldenbush
	*Lactuca serriola**	prickly lettuce
	*Logfia gallica**	narrowleaf cottonrose
	Pluchea odorata var. *orodata*	salt marsh fleabane
	Pseudognaphalium biolettii	bicolor cudweed
	Pseudognaphalium californicum	Ladies' tobacco
	*Pseudognaphalium luteoalbum**	fragrant everlasting cudweed
	Pseudognaphalium stramineum	cotton-batting plant
	Psilocarphus brevissimus var. *brevissimus*$^{\pi}$	dwarf woolly marbles
	Psilocarphus tenellus$^{\pi}$	slender woolly-marbles
	Sonchus asper ssp. *asper**	prickly sow-thistle

Attachment A (cont.)
PLANT SPECIES OBSERVED

Family	**Scientific Name**	**Common Name**
Asteraceae (cont.)	*Sonchus oleraceus**	common sow-thistle
	Stylocline gnaphaloides	everlasting nest-straw
	Xanthium strumarium	cocklebur
Boraginaceae	*Cryptantha intermedia* var. *johnstonii*	Johnston's cryptantha
	Cryptantha microstachys	tejon cryptantha
	Eriodictyon crassifolium var. *crassifolium*	felt-leaf yerba santa
	Plagiobothrys acanthocarpus$^{\pi}$	adobe popcornflower
Brassicaceae	*Brassica nigra**	black mustard
	*Hirschfeldia incana**	short podded mustard
Cactaceae	*Ferocactus viridescens* var. *viridescens*†	coast barrel cactus
	Opuntia littoralis	coast prickly-pear
Caprifoliaceae	*Lonicera subspicata* var. *denudata*	johnston's honeysuckle
Caryophyllaceae	*Polycarpon tetraphyllum* ssp. *tetraphyllum**	four-leaf allseed
	*Silene gallica**	common catchfly
	Silene laciniata ssp. *laciniata*	southern pink
	*Spergularia bocconi**	Boccone's sand-spurrey
	Spergularia sp.	spurrey species
Chenopodiaceae	*Atriplex semibaccata**	Australian saltbush
	Atriplex lindleyi	Lindley's saltbush
	*Salsola australis**	Australian tumbleweed
Cistaceae	*Crocanthemum scoparium* var. *vulgare*	coast peak rush-rose
Convoluvulaceae	*Calystegia macrostegia*	Island false bindweed
Crassulaceae	*Crassula connata*	pigmy weed
Cucurbitaceae	*Marah macrocarpa*	wild-cucumber
Cyperaceae	*Cyperus eragrostis*	tall flatsedge
	Eleocharis macrostachya	common spikerush
Ericaceae	*Xylococcus bicolor*	mission manzanita
Euphorbiaceae	*Croton setiger*	turkey-mullein
	*Euphorbia maculata**	spotted spurge
	*Euphorbia peplus**	petty spurge
	Euphorbia polycarpa	small-seed sandmat
	*Ricinus communis**	castor bean
Fabaceae	*Acacia pycnantha**	golden wattle
	Acmispon americanus var. *americanus*	Spanish-clover
	Acmispon glaber var. *glaber*	deerweed
	Acmispon micranthus	grab lotus
	*Caesalpinia gilliesii**	bird-of-paradise shrub
	*Medicago polymorpha**	bur clover
	*Melilotus indicus**	Indian sweetclover

Attachment A (cont.)
PLANT SPECIES OBSERVED

Family	**Scientific Name**	**Common Name**
Fabaceae (cont.)	*Quercus dumosa*†	Nuttall's scrub oak
	Quercus xacutidens	Torrey's scrub oak
Gentianaceae	*Zeltnera venusta*	canchalagua
Geraniaceae	*Erodium botrys**	long beaked filaree
	*Erodium cicutarium**	red-stem filaree
	*Erodium moschatum**	white-stemmed filaree
	*Geranium dissectum**	cut-leaf geranium
Juncaceae	*Juncus bufonius*	toad rush
Lamiaceae	*Marrubium vulgare**	horehound
	Salvia columbariae	chia
	Salvia mellifera	black sage
Liliaceae	*Calochortus splendens*	splendid mariposa lily
Lythraceae	*Lythrum hyssopifolia*$^{*\pi}$	hyssop loosestrife
Malvaceae	*Malacothamnus fasciculatus*	chaparral mallow
Myrsinaceae	*Anagallis arvensis**	scarlet pimpernel
Myrtaceae	*Eucalyptus camaldulensis**	river red gum
Onagraceae	*Camissoniopsis hirtella*	field sun cup
Plantaginaceae	*Antirrhinum nuttallianum* ssp. *nuttallianum*	Nuttall's snapdragon
	*Plantago coronopus**	cut leaf plantain
	Plantago elongata$^{\pi}$	long leaf plantain
	Plantago erecta	dot-seed plantain
Platanaceae	*Platanus racemosa*	California sycamore
Poaceae	*Avena barbata**	slender oat
	*Avena fatua**	wild oat
	*Brachypodium distachyon**	purple false brome
	*Bromus diandrus**	ripgut brome
	*Bromus hordeaceus**	soft chess
	*Bromus madritensis**	red brome
	*Bromus sterilis**	poverty brome
	*Cortaderia selloana**	selloa pampas grass
	*Cynodon dactylon**	Bermuda grass
	Deschampsia danthonioides$^{\pi}$	annual hairgrass
	*Festuca bromoides**	brome fescue
	*Festuca myuros**	rattail sixweeks grass
	*Festuca perennis**	Italian rye grass
	Hordeum murinum ssp. *leporinum**	foxtail barley
Poaceae	*Lamarckia aurea**	goldentop grass
	*Polypogon monspeliensis**	annual beard grass
	*Schismus barbatus**	Mediterranean grass
	Stipa lepida	foothill needle grass
	Stipa pulchra	purple needlegrass
Polemoniaceae	*Navarretia hamata* ssp. *leptantha*	hooked pincushion plant

Attachment A (cont.)
PLANT SPECIES OBSERVED

Family	**Scientific Name**	**Common Name**
Polygonaceae	*Chorizanthe fimbriata* var. *fimbriata*	fringed spineflower
	Chorizanthe polygonoides var. *longispina*†	knotweed spineflower
	Chorizanthe procumbens	prostrate spineflower
	Eriogonum fasciculatum var. *fasciculatum*	coast California buckwheat
	*Polygonum aviculare**	knotweed
	Pterostegia drymarioides	fairy mist
	*Rumex crispus**	curly docks
	Rumex salicifolius	willow dock
Portulacaceae	*Portulaca oleracea**	common purslane
Rhamnaceae	*Ceanothus tomentosus*	Ramona-lilac
	Rhamnus crocea	spiny redberry
Rosaceae	*Adenostoma fasciculatum* var. *obtusifolium*	San Diego chamise
	Cercocarpus minutiflorus	San Diego mountain-mahogany
	Heteromeles arbutifolia	toyon
	Prunus ilicifolia	holly-leaf cherry
Rubiaceae	*Galium porrigens* var. *porrigens*	climbing/oval-leaf bedstraw
Rutaceae	*Cneoridium dumosum*	coast spine bush
Salicaceae	*Salix laevigata*	red willow
	Salix lasiolepis	arroyo willow
Selaginellaceae	*Selaginella cinerascens*†	Mesa spike-moss
Solanaceae	*Datura wrightii*	jimsonweed
	*Nicotiana glauca**	tree tobacco
	Solanum parishii	Parish's nightshade
Themidaceae	*Bloomeria crocea* var. *crocea*	common goldenstar
	Brodiaea orcuttii†	Orcutt's brodiaea
	Dichelostemma capitatum	blue dicks
	Muilla maritima	common muilla

* Non-native/invasive species
† Sensitive species
π Vernal pool indicator species (Bauder et al. 2009)

Attachment B
ANIMAL SPECIES OBSERVED OR DETECTED

Order	Family	Scientific Name	Common Name
INVERTEBRATES			
Anostraca	Branchinectidae	*Branchinecta lindahli*	versatile fairy shrimp
		Branchinecta sandiegonensis†	San Diego fairy shrimp
Lepidoptera	Lycaenidae	*Brephidium exilis*	western pygmy blue
		Glaucopsyche lygdamus	silvery blue
	Nymphalidae	*Adelpha californica*	California sister
		Vanessa annabella	west coast lady
	Riodinidae	*Apodemia mormo virgulti*	Behr's metalmark
VERTEBRATES			
Amphibians			
Anura	Bufonidae	*Anaxyrus boreas*	western toad
	Hylidae	*Pseudacris hypochondriaca*	Baja California treefrog
	Ranidae	*Lithobates catesbeianus*	American bullfrog
	Scaphiopodidae	*Spea hammondii†*	western spadefoot toad
Birds			
Accipitriformes	Accipitridae	*Accipiter cooperii*	Cooper's hawk
		Buteo jamaicensis	red-tailed hawk
		Elanus leucurus†	white-tailed kite
Anseriformes	Anatidae	*Anas cyanoptera*	cinnamon teal
		Anas platyrhynchos	mallard
		Bucephala albeola	bufflehead
Apodiformes	Trochilidae	*Calypte anna*	Anna's hummingbird
Caprimulgiformes	Caprimulgidae	*Chordeiles acutipennis*	lesser nighthawk
Charadriiformes	Scolopacidae	*Gallinago delicata*	Wilson's snipe
Columbiformes	Columbidae	*Zenaida macroura*	mourning dove
Passeriformes	Aegithalidae	*Psaltriparus minimus*	bushtit
	Corvidae	*Aphelocoma californica*	western scrub-jay
		Corvus brachyrhynchos	American crow
		Corvus corax	common raven
	Emberizidae	*Melospiza melodia*	song sparrow
		Melozone crissalis	California towhee
		Pipilo maculatus	spotted towhee
		Zonotrichia leucophrys	white-crowned sparrow
	Fringillidae	*Haemorhous mexicanus*	house finch
		Spinus psaltria	lesser goldfinch
	Icteridae	*Agelaius phoeniceus*	red-winged blackbird
		Quiscalus mexicanus	great-tailed grackle
		Sturnella neglecta	western meadowlark
	Mimidae	*Mimus polyglottos*	northern mockingbird
	Paridae	*Baeolophus inornatus*	oak titmouse
	Parulidae	*Geothlypis trichas*	common yellowthroat

Attachment B (cont.)
ANIMAL SPECIES OBSERVED OR DETECTED

Order	Family	Scientific Name	Common Name
VERTEBRATES (cont.)			
Birds (cont.)			
Passeriformes (cont.)	Parulidae (cont.)	*Oreothlypis celata*	orange-crowned warbler
		Setophaga coronata	yellow-rumped warbler
	Polioptilidae	*Polioptila californica californica†*	coastal California gnatcatcher
	Regulidae	*Regulus calendula*	ruby-crowned kinglet
	Sturnidae	*Sturnus vulgaris*	European starling
	Sylviidae	*Chamaea fasciata*	wrentit
	Troglodytidae	*Thryomanes bewickii*	Bewick's wren
	Tyrannidae	*Sayornis nigricans*	black phoebe
		Sayornis saya	Say's phoebe
Piciformes	Picidae	*Colaptes auratus*	northern flicker
		Dryobates nuttallii	Nuttall's woodpecker
Reptiles			
Squamata	Colubridae	*Thamnophis hammondii†*	two-striped garter snake
		Aspidoscelis hyperythra beldingi†	Belding's orange-throated whiptail
	Teiidae		

†Sensitive species