

**MONTGOMERY FIELD LOCALIZER PROJECT
CITY OF SAN DIEGO**

MITIGATION PLAN

**MAY 7, 2010 (RECON)
REVISED NOVEMBER 25, 2015 (MERKEL & ASSOCIATES)**

Prepared for:

**City of San Diego
Engineering & Capital Projects**
Contact: Mr. Darren Genova
525 B Street, Suite 750
San Diego, CA 92101
Phone: (619) 533-4659
Fax: (619) 533-5176
E-mail: JDeAngelis@sandiego.gov

Prepared by:

Merkel & Associates, Inc.
Contact: Mr. Kyle Ince
5434 Ruffin Road
San Diego, California 92123
Phone: (858) 560-5465
Fax: (858) 560-7779
E-mail: kince@merkelinc.com



Kyle Ince, Senior Biologist



Keith W. Merkel, Principal Consultant

TABLE OF CONTENTS

1.0	INTRODUCTION.....	1
1.1	PROJECT BACKGROUND AND PURPOSE.....	2
1.2	PROJECT LOCATION	2
1.3	RESTORATION GOALS AND OBJECTIVES/ MITIGATION REQUIREMENTS	2
1.4	RATIONALE FOR EXPECTING RESTORATION SUCCESS.....	7
2.0	EXISTING CONDITIONS	8
2.1	TOPOGRAPHY AND SOILS	8
2.2	BOTANY.....	8
2.2.1	<i>San Diego Mesa Hardpan Vernal Pool</i>	9
2.2.2	<i>Chamise Chaparral</i>	9
2.2.3	<i>Non-native Grassland</i>	9
2.3	SITE CONSTRAINTS AND REGULATORY REQUIREMENTS	11
2.3.1	<i>MHPA (Multi Habitat Planning Area)</i>	11
2.3.2	<i>Sensitive Vegetation Communities</i>	11
2.3.3	<i>Sensitive Plants</i>	11
2.3.4	<i>Sensitive Wildlife</i>	14
2.3.5	<i>Jurisdictional Resources</i>	16
3.0	PROJECT IMPACTS.....	19
4.0	MITIGATION ROLES AND RESPONSIBILITIES	21
4.1	CITY OF SAN DIEGO, AIRPORTS DIVISION	21
4.2	PROJECT BIOLOGIST	21
4.3	REVEGETATION INSTALLATION (LANDSCAPE) CONTRACTOR	21
4.4	SEED SUPPLIER	22
5.0	SITE PREPARATION.....	23
5.1	SITE AND RESOURCE PROTECTION	23
5.1.1	<i>Erosion Control Measures</i>	23
5.2	SCHEDULE.....	23
5.3	VERNAL POOL WETLAND CONSTRUCTION	24
5.3.1	<i>Preliminary Design and Engineering</i>	24
5.3.2	<i>VERNAL POOL CONSTRUCTION</i>	29
5.3.3	<i>Translocation of Soils</i>	30
5.3.4	<i>Initial Weed Removal</i>	30
5.4	PLANTING PLAN	31
5.4.1	<i>Reintroduction of Vernal Pool Biota</i>	31
5.4.2	<i>Vernal Pool Topsoil Redistribution and Seed Collection</i>	31
5.4.3	<i>Establishment of Vernal Pool Target Species</i>	34
5.4.4	<i>Native Upland Restoration</i>	35
6.0	MAINTENANCE AND MONITORING PROGRAM	37
6.1	REFERENCE SITE FOR REVEGETATION SPECIFICATIONS	37
6.1.1	<i>Reference Pool Hydrology</i>	37
6.1.2	<i>Reference Pool Fairy Shrimp</i>	37

6.1.3	Reference Pool Vegetation	37
6.2	120-DAY PLANT ESTABLISHMENT PERIOD.....	39
6.3	GENERAL MAINTENANCE PROCEDURES	39
6.3.1	Weed Control.....	39
6.4	LONG-TERM MAINTENANCE	40
6.5	LONG-TERM MONITORING	40
6.5.1	Qualitative Vegetation Monitoring	42
6.5.2	Quantitative Vegetation Monitoring	42
6.5.3	Hydrological Monitoring.....	42
6.6	MONITORING REPORTS	43
6.6	PERFORMANCE STANDARDS.....	44
6.6.1	Vernal Pool.....	44
6.6.2	Upland Mitigation.....	46
7.0	REMEDATION MEASURES	48
8.0	COMPLETION OF MITIGATION NOTIFICATION.....	49
9.0	LONG-TERM SITE MANAGEMENT	50
10.0	REFERENCES CITED	53

TABLE OF FIGURES

Figure 1:	Regional Location	3
Figure 2:	Project Location on USGS Map.....	4
Figure 3:	Project Location on City 800' Map	5
Figure 4:	Aerial Photograph of Survey Area	6
Figure 5:	Biological Resources Found within the Survey Area.....	10
Figure 6:	Survey Area and Project Impacts in Relation to City of San Diego MHPA Lands	12
Figure 7:	Sensitive Plants Found within the Survey Area.....	13
Figure 8:	Sensitive Wildlife Found within the Survey Area	15
Figure 9a:	USACE Jurisdictional Areas within the Survey Area	17
Figure 9b:	City of San Diego/RWQCB Jurisdictional Areas within the Survey Area	18
Figure 10a:	Mitigation Site Existing Topography	25
Figure 10b:	Mitigation Site Proposed Grading and Hydrology Map.....	26
Figure 10c:	Reference and Mitigation Site Pool Depths	27
Figure 10d:	Mitigation Site Pooling Depth Distribution Compared to Design Reference Pools	28
Figure 11a:	Vernal Pool Restoration and Upland Planting Area.....	32
Figure 11b:	Mulch Removal Area	33
Figure 12:	Reference and Donor Pool Locations in Relation to Restoration Area	36

TABLE OF TABLES

Table 1:	Vegetation Communities and Land Cover Types within the Montgomery Field Mitigation Area... 9
Table 2:	Construction Related Habitat Impacts, Jurisdictions, and Mitigation Summaries
Table 3:	Seeding List for Vernal Pool Restoration Area
Table 4:	Seed Mix and Application Rates for the Native Upland Restoration Area.....
Table 5:	Anticipated Exotic and Weedy Herbaceous Plant Species
Table 6:	Maintenance and Monitoring Schedule
Table 7:	Target Wildlife Indicator Species

1.0 Introduction

This document serves as the habitat restoration plan to compensate for impacts to an extant vernal pool as a result of improvements to the Instrument Landing System (ILS), located at Montgomery Airfield (MYF) in San Diego, California. This plan has been developed in accordance with the City of San Diego Guidelines for Conducting Biology Surveys, Appendix III (City of San Diego 2002). This report draws from data collected in the Draft Biological Technical Report for the *MYF Localizer Project at Montgomery Field (RECON 2009)*, *Draft Montgomery Airfield Environmental Constraints Report (RECON 2008a)*, *Draft Jurisdictional Determination (RECON 2008b)*, and the *As-Built/Post-Construction Report for the Montgomery Field Localizer Antenna Protection Project (Merkel 2011)*. The vernal pool numbering system used in this report remains consistent with numbers used in previous reports.

This report was initially prepared by RECON as a pre-construction mitigation plan, which called for restoration and enhancement of impacted San Diego Mesa vernal pool habitats and non-native grasslands. It was subsequently updated by Merkel and Associates, Inc. (M&A) to entail vernal pool and upland habitat restoration in vernal pool #'s 34, 35, and 42. During a meeting with the resource agencies on March 1, 2012, the U.S. Fish and Wildlife Service (USFWS) rejected the location of the proposed mitigation area stating that the proposed location did not afford the desired protection from possible additional expansion of the localizer. This report includes a newly defined mitigation area that is located approximately 4,000 feet to the northeast of the localizer or approximately 1,000 feet east of the airfield's control tower.

The MYF Localizer Project (Project) was implemented under an emergency CEQA exemption, ACOE RGP 63 with Section 7 Consultation, and a RWQCB 401 Water Quality Certificate in order to restore critical aviation safety services to MYF. Construction of the project took place in January 2011, and was monitored by M&A. Acreages between pre- and post-project impact analysis varied slightly. Post-project impacts are recorded in this mitigation plan and are the basis for the proposed mitigation herein. Habitats in the vicinity of the mitigation site include non-native grassland, disturbed land, chamise chaparral, and San Diego mesa hardpan vernal pools. This mitigation project will provide important habitat for the federally listed San Diego fairy shrimp (*Branchinecta sandiegonensis*).

The project impacted 0.19 acre of vernal pool habitat, requiring 0.95 acre of habitat mitigation. This mitigation plan includes a total of 2.43 acres of vernal pool restoration area on an approximately 6.97 acre site. Total vernal pool acreage has been defined by the maximum pool surface area based on fully inundated pool basins that have reached their designed sill elevation. Actual pooling is expected to average below this maximum basin-full condition and reflect approximately 1.0 acre of pooling under normal rainfall years. To design the pool basin and mima mound topography, a reference area was selected from within the intact and well developed vernal pool complex located to the southeast of the Montgomery Field Runway 28L. This reference pool complex is one of the most intact representatives of natural pool topology on Kearney Mesa and thus provides a good template design for the mitigation area. If mitigation site grading is conducted appropriately with adequate compaction, it is anticipated that the developed hydrology including runoff and pooling would follow that of the reference pools.

1.1 Project Background and Purpose

The MYF Localizer Project was an emergency response to raise low elevations in critical areas of an existing localizer antenna on Runway 28R on Montgomery Field, to prevent areas of standing water, which interfere with antenna operation. To reduce the potential hazard of radio signal deflection, approximately 0.19 acre of a vernal pool (vp #34) was filled and approximately 1.0 acres of non-native grasslands were converted to urban developed habitat.

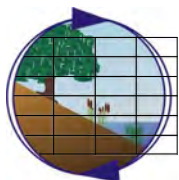
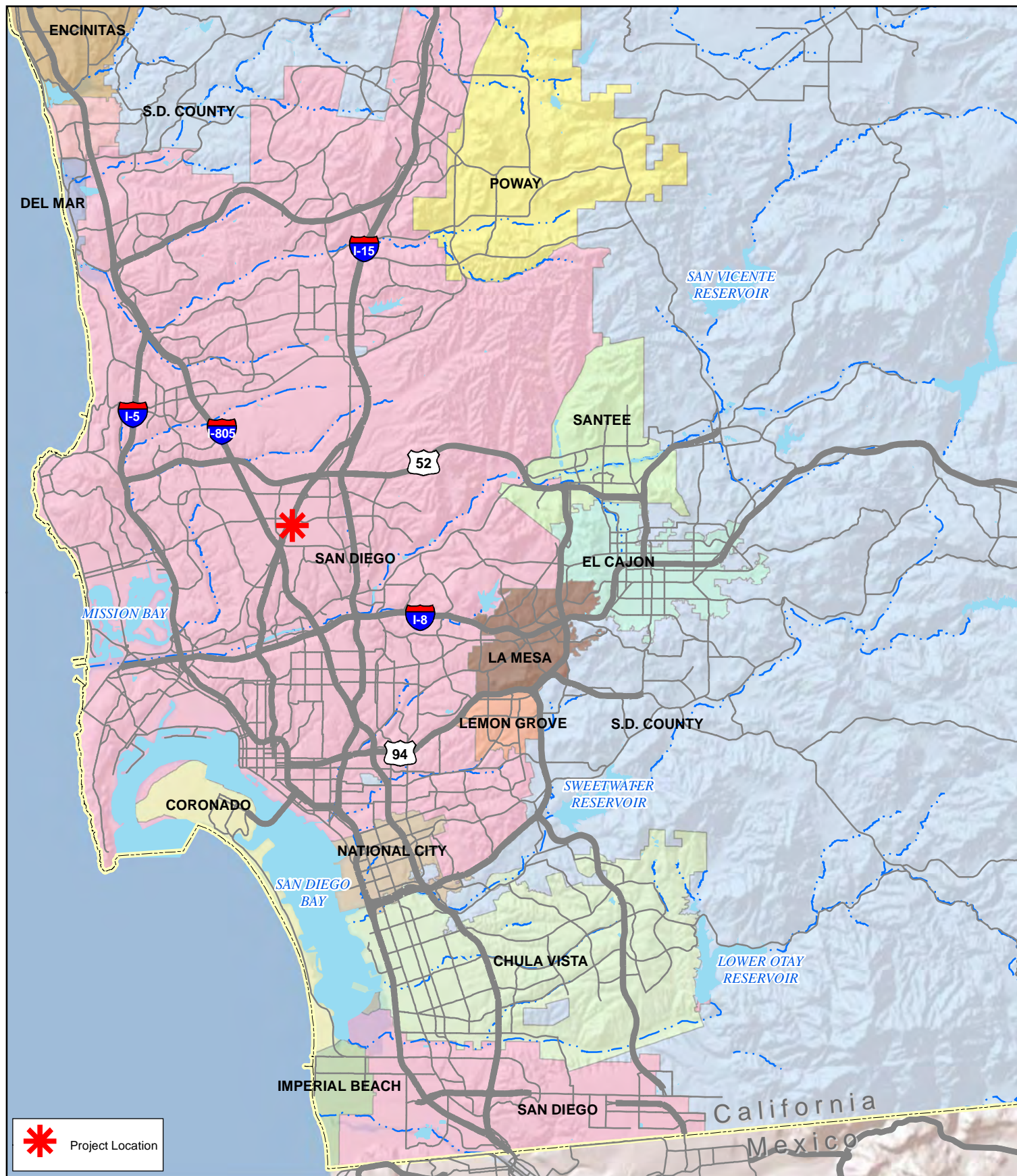
Mitigation will include restoration of vernal pool habitat. Restoration (also referred to as creation throughout this document) will be accomplished by re-contouring existing non-native grassland habitat in order to provide a mosaic of vernal pool wetlands and mima mound topography. The restored vernal pool areas will be inoculated with native vernal pool sediment anticipated to support floral and faunal propagules from impacted pools. This sediment will be acquired from soil that was salvaged prior to the localizer pad impacts. In addition, plant propagules and soil clumps containing shrimp cysts will be selectively acquired from natural vernal pools found on the airport property. One final source of vernal pool inoculum will come from collection of wood mulch removed from vp #34 and rinsed to collect any fairy shrimp cysts. The uplands will be planted/seeded with native species typical of grassland habitat in the area. Adaptive monitoring will be applied to both vernal pools and grasslands for a period of 5-years to ensure success of the mitigation effort.

1.2 Project Location

The project is located on the MYF in San Diego, California. MYF is located near Kearney Mesa in the City of San Diego in western San Diego County, California (Figures 1, 2, 3, and 4). The mitigation site is located in the U.S. Geological Survey (USGS) La Jolla Quadrangle, Township 16 South, Range 3 East (USGS 1975; see Figure 2).

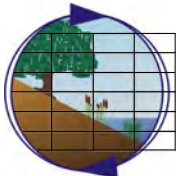
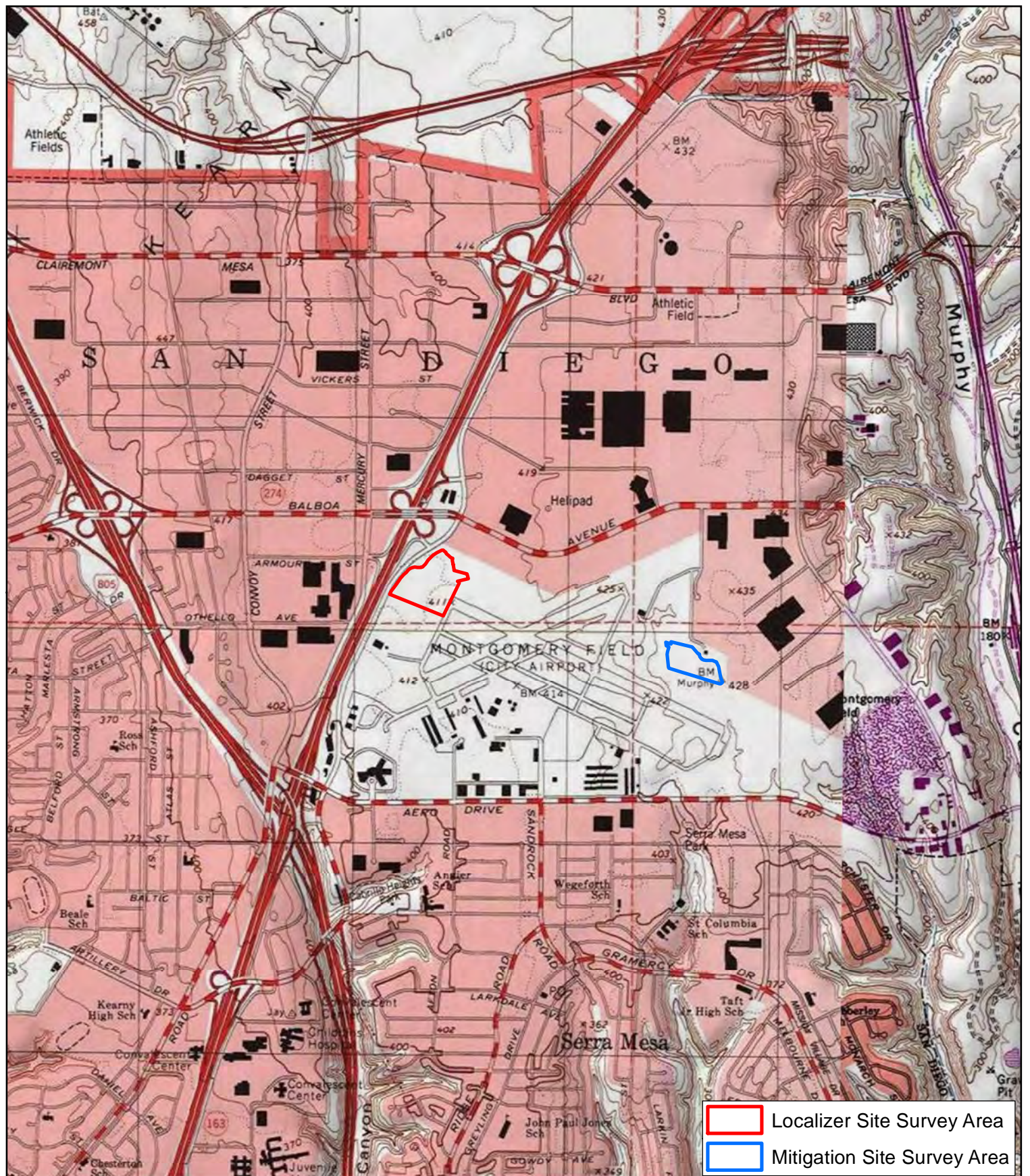
1.3 Restoration Goals and Objectives/ Mitigation Requirements

The goal of this mitigation project is to mitigate for lost vernal pool wetland habitats and non-native grassland habitats associated with the project by creating new vernal pools on the MYF and restoring grasslands within the mima mound topography interstitial to the pools. The created vernal pool habitat is expected to support similar plant and animal species and hydrological characteristics as the pool that was impacted but would be enhanced as these pools and uplands are not maintained by regular mowing for runway overrun purposes. The created pool habitats are intended to support viable populations of the federally endangered San Diego fairy shrimp, and the restored uplands will mitigate for areas of non-native grassland that were also impacted by the localizer project. The restored uplands will include mima mounds and drainage swales that are typically associated with San Diego Mesa hardpan vernal pool complexes.



Regional Location
Montgomery Field Localizer Antenna Protection Project
San Diego, CA

Figure 1



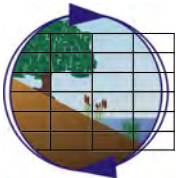
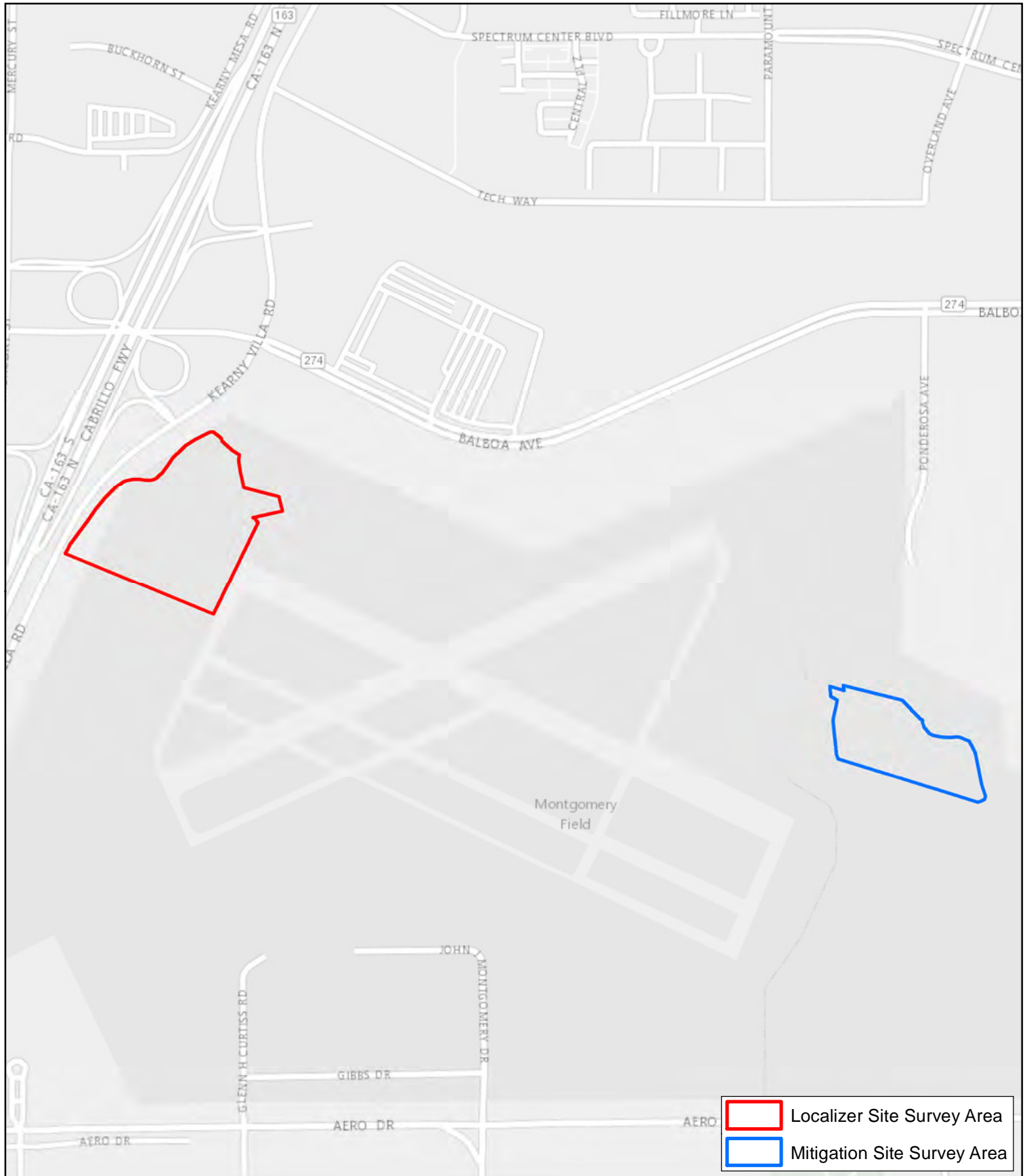
1:24000

Project Location on USGS Map

Montgomery Field Localizer Antenna Protection Project

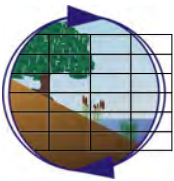
Source: USGS 7.5' La Jolla, CA Quadrangle

Figure 2



Project Location on City 800' Map
Montgomery Field Localizer Antenna Protection Project

Figure 3



Aerial Photograph of Survey Area
Montgomery Field Localizer Antenna Protection Project

Figure 4

1.4 Rationale for Expecting Restoration Success

Many vernal pool restoration projects in the San Diego region have been successfully implemented using techniques outlined in this restoration plan. Existing examples of vernal pool restoration projects in the San Diego region range in age from 1 to 24 years. The oldest example was a controlled study evaluating the effects of topographic restoration and seed dispersal facilitation (Scheidlinger et al. 1985). After 14 years, vegetation in the restored pools and disturbed areas of the site with persisting pool hydrology was equivalent to that of natural pools (Patterson 1995). In restoration programs conducted on Lopez Ridge (Patterson and Netting 1994a) and Naval Air Station Miramar (Patterson and Netting 1994b), restoration success criteria similar to those proposed herein were met within two seasons. Other local vernal pool restoration projects have been implemented at: Marine Corps Air Station Miramar; Marine Corps Base Camp Pendleton, Chollas Heights Naval Housing Project; Otay Mesa; Montgomery Field Airport; Dennerly Canyon vernal pool, coastal sage scrub, and mulefat scrub restoration and preservation project (RECON 1997); Poinsettia Station, Carlsbad (Merkel & Associates 1998); and at the Wire Mountain Housing Area, Marine Corps Base Camp Pendleton (RECON 2001).

2.0 Existing Conditions

The MYF Localizer mitigation area is approximately 6.97 acres located on the Montgomery Airfield property, approximately 1,000 feet east of the control tower. It is bordered to the north by an FAA maintenance pad and to the east by the perimeter access road, and to the south by the Runway Protection Zone (RPZ) along the north side of Runway 28R. The site slopes gradually to the southwest at an average slope of less than one percent and is primarily composed of non-native grassland vegetation which comprises 5.88 acres of the site. A sparsely shrub dominated chamise chaparral habitat (1.08 acres) occurs along the western boundary of the site. One vernal pool and/or jurisdictional wetland comprising 263 square feet (i.e., 0.01 acre) occurs on the site and will be protected in place. A utility easement containing a buried FAA electrical line that powers runway lights crosses the site in a diagonal alignment from the northwest to the southeast. Site elevation ranges from approximately 422 to 433 feet above mean sea level with the high points being on the tops of existing mounds and the low point being on the westerly edge of the site where terrain begins a slow drop towards a shallow drainage swale located to the west of the site.

2.1 Topography and Soils

The soil type within the study area was identified based on the reports and maps in the *Soil Survey for the San Diego Area* (U.S. Department of Agriculture 1973). The basic soil type is Redding gravelly loam. Redding gravelly loam (RdC), 2 to 9 percent slopes, consists of well-drained, undulating to steep gravelly loams that have a gravelly clay subsoil and hardpan. These soils formed in old mixed cobbly and gravelly alluvium, a soil type historically associated with vernal pools, and account for all of the soils in the survey area. A site review of these soils suggests that they are consistent in color and texture across the site of the proposed work and pool complexes throughout MYF.

2.2 Botany

Three vegetation communities were identified within the mitigation work area: San Diego Mesa hardpan vernal pool, chamise chaparral, and non-native grassland. Vegetation communities are summarized in Table 1 and are illustrated in Figure 5. The mitigation work area includes the vernal pool mitigation lands, non-native grassland mitigation lands, and areas of the site necessary to be graded to create watershed and drainage patterns essential to meet the mitigation objectives.

TABLE 1
VEGETATION COMMUNITIES AND LAND COVER TYPES (acres)
WITHIN THE MONTGOMERY FIELD MITIGATION AREA

Community or Type	Tier	Holland/ Oberbauer Codes	Acres
San Diego Mesa Hardpan Vernal Pool	*	44322	0.01
Chamise Chaparral	IIIA	37200	1.08
Non-native Grassland	IIIB	42200	5.88
Total			6.97

* Wetland/Riparian vegetation communities do not have an assigned Tier, but are considered sensitive under Federal, state, and local jurisdictions.

2.2.1 San Diego Mesa Hardpan Vernal Pool

City of San Diego SanGIS data exhibited a small (263 sq. ft.) vernal pool near the southern boundary of the mitigation area. Species typical of vernal pools on MYF include woolly marbles (*Psilocarphus brevissimus* var. *brevissimus*), Bigelow's plantain (*Plantago bigelovii*), hyssop loosestrife (*Lythrum hyssopifolium*), toad rush (*Juncus bufonius*), and water pygmyweed (*Crassula aquatica*).

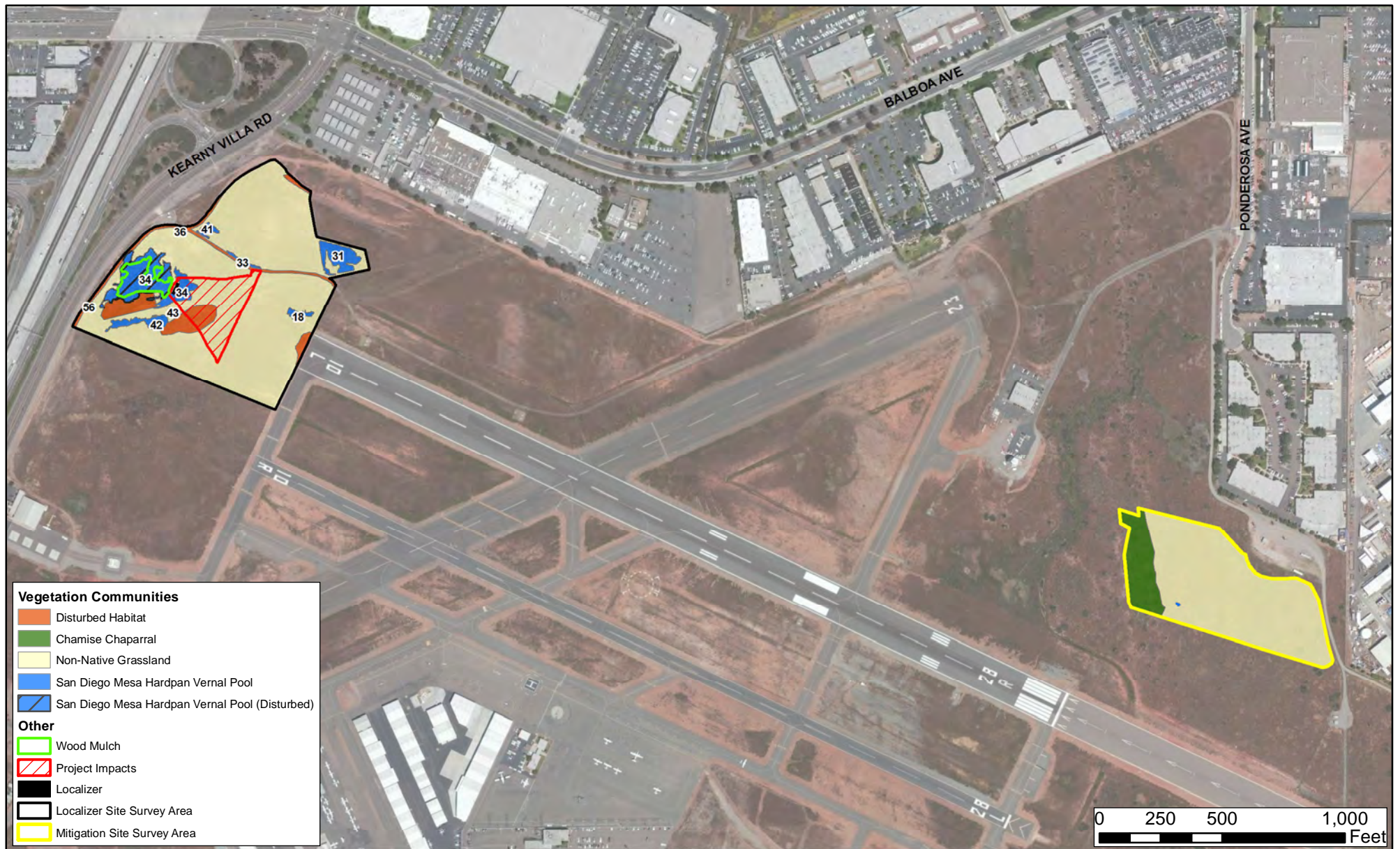
2.2.2 Chamise Chaparral

Approximately 1.08 acre of chamise chaparral occurs within the mitigation area. It primarily consists of common chamise (*Adenostoma fasciculatum*), with fewer numbers of laurel sumac (*Malosma laurina*) and scrub oak (*Quercus berberidifolia*). Non-native grasses including wild oat (*Avena barbata*) and red brome (*Bromus madritensis* ssp. *rubens*) occur between the scattered shrubs. Annual forbs including blue toadflax (*Nuttallanthus texanus*) and fascicled tarplant (*Deinandra fasciculata*) were also noted amongst the grasses.

2.2.3 Non-native Grassland

Non-native grassland is an open vegetation community characterized by a sparse to dense cover of annual grasses reaching to three feet high, which may include numerous native wildflowers, particularly in years of high rainfall (Holland 1986). It is considered a sensitive vegetation community within the City's jurisdiction because it provides foraging habitat for raptors and suitable habitat for a variety of small mammals and invertebrates.

Approximately 5.88 acres of non-native grassland occur within the mitigation work area (Figure 5). Plant species within the non-native grassland include wild oat (*Avena barbata*), foxtail chess (*Bromus madritensis* ssp. *rubens*), and wild barley (*Hordeum murinum*). The native Purple needlegrass (*Stipa pulchra*) occurs sporadically in this area. Native annual plants including catchfly (*Silene gallica*), bishops lotus (*Lotus strigosus*), and miniature lupine (*Lupinus bicolor*) were also noted within this area. Several corm/bulb sprouting species including small flowered soap plant (*Chlorogalum parviflorum*), blue dicks (*Dichelostemma capitatum* ssp. *capitatum*), common muilla (*Muilla maritima*) and the sensitive San Diego goldenstars (*Bloomeria clevelandii*) were detected in this habitat.



Biological Resources Found within the Survey Area
Montgomery Field Localizer Antenna Protection Project

Figure 5

2.3 Site Constraints and Regulatory Requirements

2.3.1 MHPA (Multi Habitat Planning Area)

The mitigation site lies completely within the City of San Diego Multi-Habitat Planning Area (MHPA) (Figure 6). The City manages all land uses within and adjacent to the MHPA in order to minimize impacts to the preserved lands.

The City of San Diego Multiple Species Conservation Plan (MSCP) provides Land Use Adjacency Guidelines that must be addressed by project proponents in order to demonstrate compliance with the MSCP (City of San Diego 1997). These guidelines include project design restrictions regarding drainage, toxins, lighting, noise, barriers, invasive species, and grading. The proposed mitigation work complies with all guidelines required for work conducted within the MHPA.

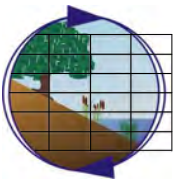
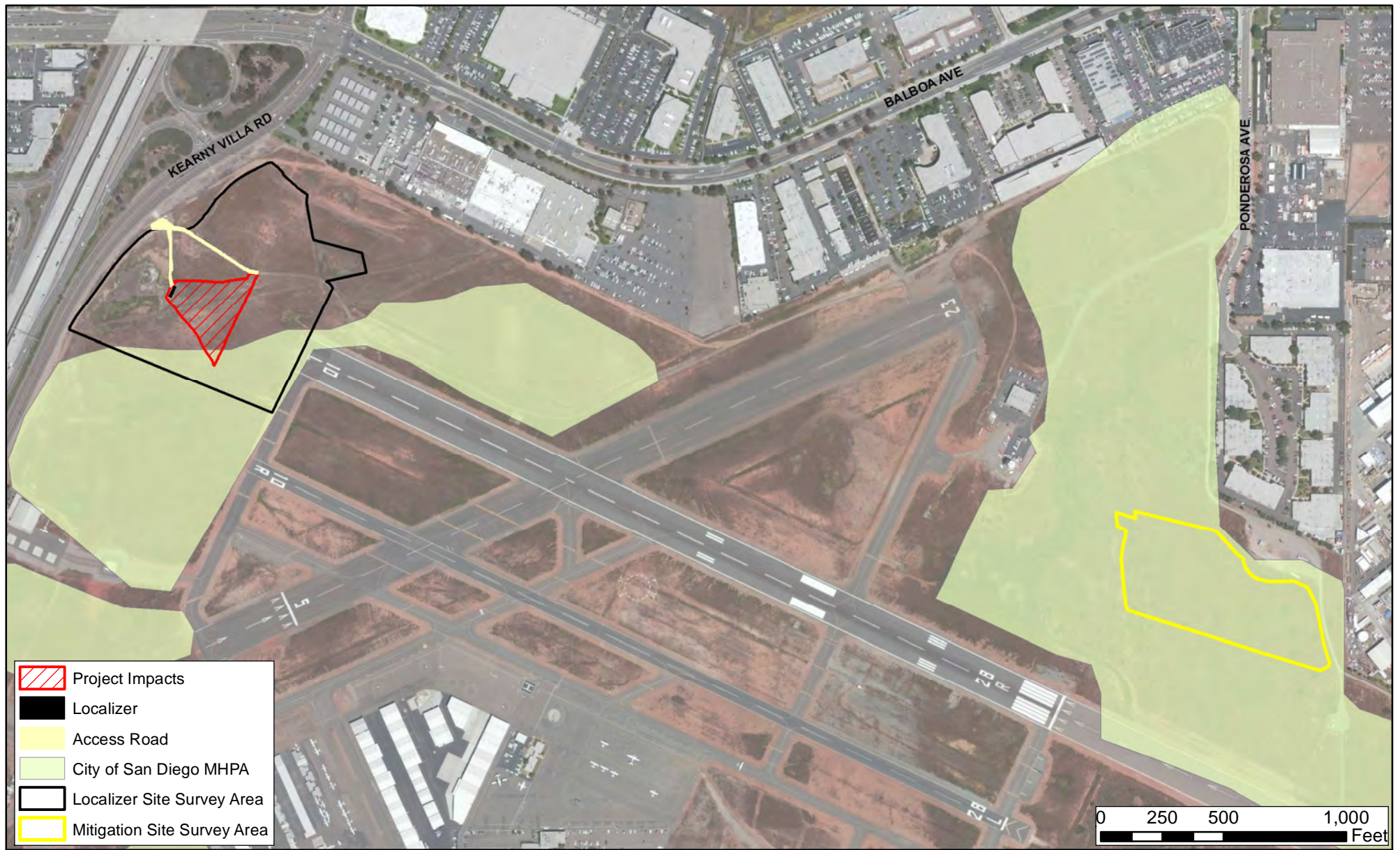
2.3.2 Sensitive Vegetation Communities

A vegetation community is classified as sensitive by the State of California (2009a) and the MSCP if an endangered, threatened, or rare species may potentially occupy the community. Other reasons for the sensitive status of these vegetation communities include restricted range, cumulative losses throughout the region, and a high number of endemic sensitive plant and wildlife species that occur in these vegetation communities. These communities are considered sensitive whether or not they have been disturbed.

Three sensitive vegetation types, San Diego hardpan vernal pool, chamise chaparral and non-native grassland, were found within the mitigation area (see Figure 5). Although both chamise chaparral and non-native grasslands habitats are classified as a Tier III (Common Upland) by the City of San Diego's Biology Guidelines (City of San Diego 2012a), they fall under the classification of "sensitive" because sensitive plant species were observed occupying these habitats.

2.3.3 Sensitive Plants

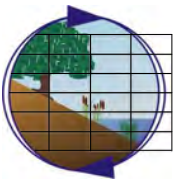
One sensitive plant species, San Diego goldenstars was observed within the mitigation area. San Diego goldenstars is present within both the non-native grassland and chamise chaparral habitat of the mitigation area (Figure 7). This species is a CRPR (CNPS 2012) List 1B.1 species. A CRPR 1B.1 species is a plant that is seriously threatened in California. San Diego goldenstars is a covered species under the City of San Diego MSCP. Several relatively small populations (1 to 15 individuals) were found within non-native grassland and chamise chaparral habitat (Figure 7).



Survey Area and Project Impacts in Relation to the City of San Diego MHPA Lands

Montgomery Field Localizer Antenna Protection Project

Figure 6



Sensitive Plants Found within the Survey Area
Montgomery Field Localizer Antenna Protection Project

Figure 7

This plant will be salvaged prior to grading and reintroduced to upland areas following final grading. Two sensitive plant species, graceful tarplant (*Holocarpha virgata* ssp. *elongata*) and Orcutt's brodiaea (*Brodiaea orcuttii*), were observed within the study area of the localizer project site (Figure 7). These plants were sought in the mitigation area during a survey of the site on March 16, 2015, by Merkel & Associates staff biologist Kyle Ince, but were not observed.

Graceful tarplant is present within the non-native grassland habitat of the localizer project site (Figure 7). Graceful tarplant is a CRPR (CNPS 2012) List 4.2 species. A CRPR 4.2 listing identified plant species has a limited distribution and is fairly endangered in California. Graceful tarplant is ubiquitous throughout the upland portions of the study area surrounding the localizer project area (Figure 7). Hundreds of individuals were observed in non-native grassland habitat in this area. Graceful tarplant will be part of the native seed mix that will be applied to the native upland habitats in the mitigation area.

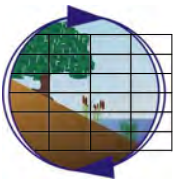
Eight individual Orcutt's brodiaea plants were noted within the study area surrounding the localizer project site. It was not observed within the mitigation site. Orcutt's brodiaea is a covered species under the City of San Diego MSCP. It is also a List 1B.1 species (a plant that is seriously threatened in California).

2.3.4 Sensitive Wildlife

Vernal pools within the survey area for the localizer project, including the impacted vernal pool (#34), were observed supporting San Diego fairy shrimp (Figure 8).

San Diego fairy shrimp (*Branchinecta sandiegonensis*). The San Diego fairy shrimp is federally listed as endangered. This fairy shrimp occurs in limited populations in Santa Barbara and Orange Counties and in San Diego County from San Marcos and Ramona south to Otay Mesa and into northwestern Baja California, Mexico, at Valle de Las Palmas (U.S. Fish and Wildlife Service [USFWS] 1997). The majority of San Diego fairy shrimp populations are located in San Diego County. San Diego fairy shrimp are restricted to vernal pools and prefer cool water temperatures. This species can also be found in ditches and road ruts that are located in degraded vernal pool habitat. Fairy shrimp remain dormant in cysts until pools fill during the rainy season. Fairy shrimp nauplii, the first larval stage of crustaceans, emerge from cysts and develop into adults sometime between mid-December and early May (Eriksen and Belk 1999). Development takes between 10 to 20 days and is dependent on water temperature. Primary threats to this species are habitat destruction and fragmentation, alterations of wetland hydrology, off-road vehicle activity, and grazing (USFWS 1997).

A total of 10 hydrologic depressions within the project area were surveyed seven times by RECON biologists between December 24, 2007, and March 11, 2008. Adult fairy shrimp were located in six of the depressions. Among these, adult San Diego fairy shrimp were observed in vernal pool #34, the only pool impacted by the Project (Figure 8). Population estimates of San Diego fairy shrimp within each pool varied from hundreds in smaller pools to as large as one million in the larger pools. Vernal pool #34 was observed to contain hundreds of San Diego fairy shrimp. M&A surveys of the project site confirmed the presence of fairy shrimp within vernal pool #34 and peripheral pools. This species was directly impacted by the localizer project. No San Diego fairy shrimp have been recorded for the mitigation site.



Sensitive Wildlife Found within the Survey Area
Montgomery Field Localizer Antenna Protection Project

Figure 8

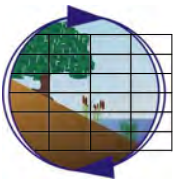
2.3.5 Jurisdictional Resources

U.S. Army Corps of Engineers (ACOE) non-wetland waters, California Department of Fish and Wildlife (CDFW), and Regional Water Quality Control Board (RWQCB) jurisdictional resources were delineated within the survey area, (RECON 2008a) (Figures 9a and 9b).

The following delineation results are based on an on-site meeting with ACOE (December 2, 2009) and discussion concerning the post-Solid Waste Agency of Northern Cook County and Rapanos interpretations of vernal pools as isolated waters. After consulting a six-inch topographic relief map and a walk through of the survey area, ACOE asserted jurisdiction over all pools within the survey area, citing hydrologic connection to a man-made drainage swale with a significant nexus to Traditional Navigable Waters (TNW). Prior to project construction an ACOE, Los Angeles District Regional General Permit 63 for emergency activities involving fill in waters of the U.S. was obtained.

CDFW regulates all changes to the natural flow or bed, channel, or bank of any river, stream, or lake that supports fish or wildlife. Per discussion with CDFW staff and City of San Diego staff on November 11, 2009, it was concluded that CDFW would not take jurisdiction over affected wetlands at MYF unless California state-listed species were present. As no California state-listed species were observed within the survey area, no CDFW jurisdictional impacts are present in the Project area.

The RWQCB has jurisdiction over all waters of the U.S and isolated waters of the state as mandated by both the federal Clean Water Act and the California Porter-Cologne Water Quality Control Act. Prior to project construction, a 401 Water Quality Certificate was obtained from the RWQCB.



USACE Jurisdictional Areas within the Survey Area
Montgomery Field Localizer Antenna Protection Project

Figure 9a



City of San Diego/RWQCB Jurisdictional Areas within the Survey Area
Montgomery Field Localizer Antenna Protection Project

Figure 9b

3.0 Project Impacts

Final impact acreages for the localizer project were determined by comparing pre- and post-construction differentially corrected global positioning system (dGPS) pool and habitat boundary survey data. This information was then plotted over a rectified aerial photograph of the site and total impact area was then determined.

Habitats impacted due to project implementation include fills over San Diego mesa vernal pool, non-native grassland and disturbed habitat. The ACOE asserted jurisdiction over all pools within the project area (Recon 2010), citing hydrologic connection to a man-made swale that drains from between the runways of the airfield out to an enclosed storm drain system at SR-163 and ultimately to the San Diego River and into the Pacific Ocean, a traditional Navigable Water (TNW). In addition to the ACOE, the on-site vernal pools are also jurisdictional under the Regional Water Quality Control Board (RWQCB), and the City of San Diego (City). A small portion of the non-native grassland occurs within the boundary of the City's Multiple Habitat Planning Area (MHPA). Impacts to habitats which occur within the MHPA boundary require higher mitigation ratios than if they occur outside the MHPA.

San Diego mesa vernal pool and non-native grassland require mitigation under the City's Biology Guidelines (2004). Impact totals per habitat, agency jurisdiction, as well as mitigation ratio requirements are listed in Table 2. At the time of the emergency construction of the localizer pad, the effected vernal pool (vp #34) was filled to capacity with a continual drainage of water, evidenced by visually detectable, flow to the west from areas near the localizer construction area. This flow indicated that the sill elevations had been met and the pool was draining out to the lower pools and ultimately to the man-made drainage swale.

Table 2. Construction Related Habitat Impacts, Jurisdictions, and Mitigation Summaries.

Habitat	Habitat Tier	Agency Jurisdiction	Impacts (acre)	Mitigation Ratio	Total Mitigation (acre)
MYF San Diego Mesa Vernal Pool	----	ACOE, RWQCB, City of San Diego	0.19	5:1	0.95
MYF Non-Native Grassland	IIIB	----	1.2	0.5:1	0.60
MYF Non-Native Grassland (within MHPA)	IIIB	----	0.05	1:1	0.05
MYF Disturbed Habitat	IV	----	0.12	----	----
TOTAL			1.56		1.6

As noted in Table 2, a 5:1 mitigation ratio has been applied for impacts to the project area vernal pool habitat. This ratio differs from the City's typical 4:1 mitigation ratio outlined for impacts to vernal pools supporting endangered species with very limited distribution. It also differs from the typical 3:1 mitigation

ratio required by the ACOE and RWQCB for impacts to vernal pool habitats. However, in response to the emergency status and permitting of the current project during pooling presence, the ACOE in consultation with the USFWS, required a 5:1 mitigation ratio for impacts to vernal pool habitat with actively swimming, adult San Diego fairy shrimp. The City did not contest this ratio for the particular circumstances of the emergency action based on the inability to implement many best management practices that may otherwise have been available if construction were performed in a non-emergency condition during the dry season.

4.0 Mitigation Roles and Responsibilities

4.1 City of San Diego, Airports Division

The City of San Diego Airports Division, hereafter “Airports Division,” shall be responsible for coordination. The Airports Division shall manage project activities in the best interest of restoration goals. Decisions to stop work are the responsibility of the Airports Division, except where noted herein. The Airports Division shall have sole authority in decisions to suspend payment or terminate such contracts. This includes all phases of project installation, maintenance, and biological monitoring.

4.2 Project Biologist

The project biologist will be an individual or team of individuals with a minimum of three years experience in vernal pool restoration and holding a valid USFWS permit for field collection and identification of fairy shrimp. The project biologist will perform the following tasks, and be responsible for monitoring the restoration in accordance with the wetland mitigation plan specifications, as well as all RGP 63 Special Conditions.

- Consult with the contractor on any activities that may be disruptive to revegetation.
- Monitor qualified contractors in execution of plan implementation and maintenance.
- Oversee and perform the required monitoring and reporting in accordance with the procedures established in this plan.

4.3 Revegetation Installation (Landscape) Contractor

The landscape contractor shall have a minimum of three years experience in vernal pool restoration. The landscape contractor will be responsible for implementing the tasks outlined in this plan under the supervision of the project biologist.

- Conduct civil survey, utilities location, and horizontal and vertical control for landform grading.
- Complete landform grading and compaction of restoration site.
- Collect donor vernal pool inoculum under the oversight of project biologist.
- Prepare and install habitat revegetation as outlined in this plan.
- Maintain site as outlined in this plan.

- Implement storm water best management practices.
- Avoid and minimize impacts to any adjacent habitats including vernal pools and their watersheds.
- Avoid overspray of artificial watering and/or herbicide application into adjacent habitats including vernal pools and their watersheds.

4.4 Seed Supplier

Native seed for restoration may be acquired from an outside supplier with at least two years experience collecting vernal pool seed for restoration projects.

- Only species specified by the project biologist will be collected.
- Seed will be collected from the immediate vicinity of the project site for vernal pool species.
- The range of seed collection for the native upland species will be limited to coastal San Diego County (within 10 miles of the ocean) and preferably within a 10-mile radius of the revegetation site, if possible.
- If locally available seed does not exist for a particular species, the landscape contractor shall consult with the project biologist to determine alternatives.

5.0 Site Preparation

5.1 Site and Resource Protection

Protection of sensitive vegetation communities, plants, wildlife, and jurisdictional resources will be addressed by avoiding impacts to any adjacent sensitive resources. Restoration boundaries will be clearly marked prior to construction. Restoration activities will remain within project boundaries. All ingress and egress to the site will be limited to existing roads and compliant with MYF security and safety requirements. All equipment will be staged on existing roads and gravel storage pads. The project biologist will be present at all stages of restoration to ensure that inadvertent impacts to sensitive resources in the area are avoided.

5.1.1 Erosion Control Measures

Erosion control measures, such as straw wattles and silt fencing, will be installed as directed by project biologist to help protect against erosion while seeded vegetation becomes established. Because the site is an extremely flat terrain that naturally drains to existing swales that are defined as vernal pools, classical erosion control measures of silt fencing and wattles must be carefully and sparingly placed to avoid generation of concentrated flow from site drainage. Excavation of a toe embedment for silt fencing is not desirable if it can be avoided as it may alter natural drainage patterns on the site. For this reason, silt fencing will not be placed unless site grading has not been completed by October 1. Internal drainage to pool basins will substantively reduce potential for high volume runoff from the site. If grading is completed by October 1, down slope silt runoff control will be addressed by staking straw wattle fiber rolls down across the terminal spill points to the mitigation site. If grading is not completed by October 1 such that internal pool basins are formed, then a combination of fiber rolls and silt fencing will be placed to control sediment discharge to the downstream swale. The extent of fencing and fiber roll use will depend upon the extent of grading that has been completed as of October 1.

5.2 Schedule

The proposed work is anticipated to require approximately three months. Site preparation will begin in the summer following site drying (estimated July 2016) and be completed before the onset of winter rains (September 2016). Topographic reconstruction will occur in summer and early fall. Planting, translocation, and seeding will occur during the early winter (October – November 2016) to correspond with cooling weather and early rain events. Maintenance tasks such as weed control will take place as exotic species appear, while supplemental or replacement seeding or planting will be limited to the early winter to spring months (October to March).

5.3 Vernal Pool Wetland Construction

5.3.1 Preliminary Design and Engineering

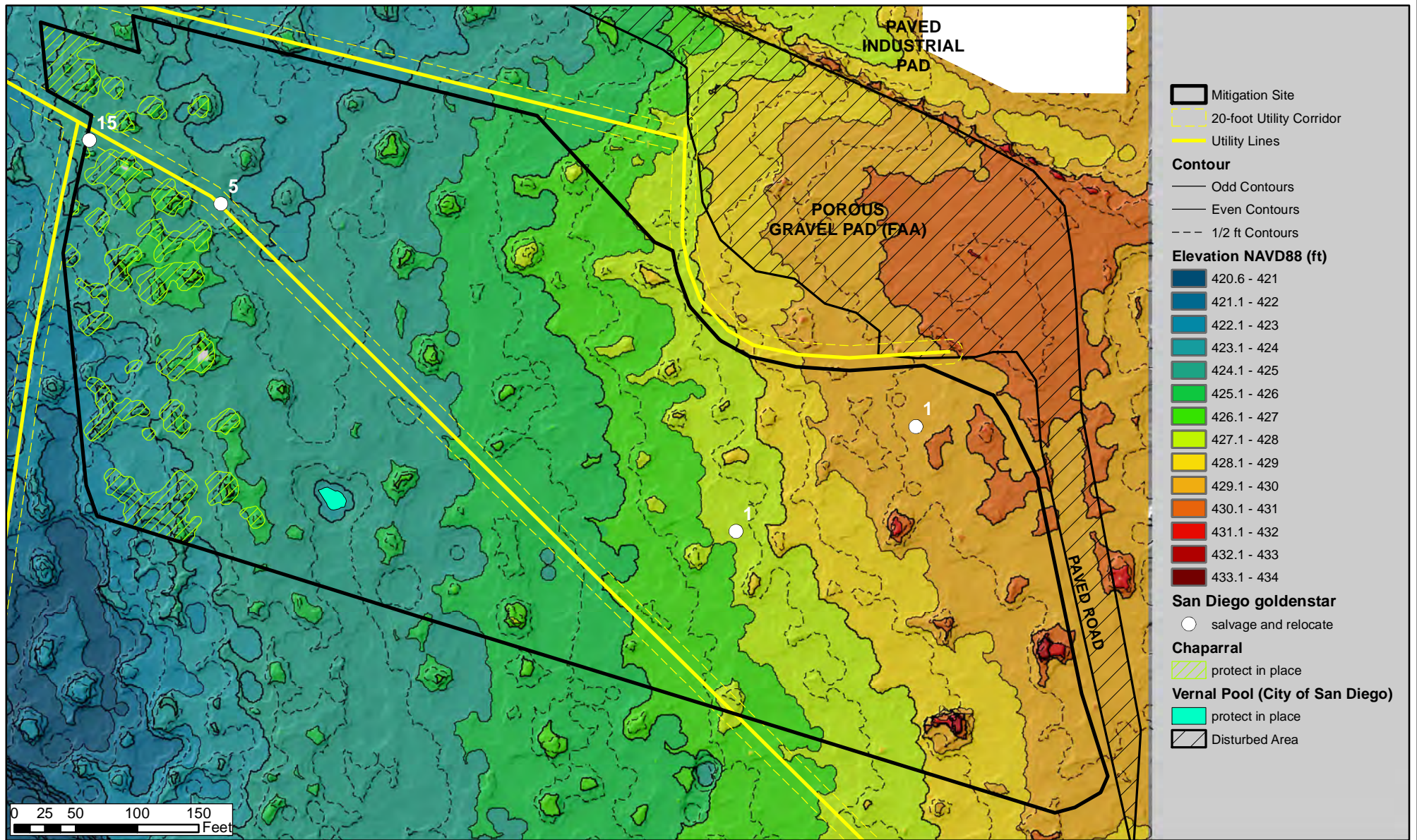
Conceptual planning of the mitigation area involved the preparation of a preliminary design for the creation of mitigation vernal pool wetlands. The base topography used to develop these plans was from 2005 LIDAR data provided by the City of San Diego and distributed by USGS.

Existing elevation contours of the mitigation site are provided in Figure 10a and proposed grading is provided in Figure 10b. The proposed grading was designed to mimic a vernal pool reference site located approximately 2,000 feet southeast of the mitigation area. This reference site was agreed upon by the Corps and USFWS to be ideal as a design template for the mitigation pools. The proposed grading plan generally utilizes existing site mound topography and augments the material by excavating between the mounds as well as raising mounds. Because the current density and relief of mounds at the mitigation site is not as great as at the reference site, designs have added to mound elevation and density and have excavated pool basins between mounds to more closely mimic the topographic relief of the reference site.

The designed grading is effectively a gradual terrace that slopes to the southwest. Mounds are aligned in a manner that creates sills through saddles that allows water to fall along the natural fall towards the southwest, spilling from one set of pools to the next during extreme rain conditions, and draining into internal vernal pool basins during normal rainfall conditions. Figure 10b provides both inflow and outflow drainage patterns anticipated to occur as a result of the proposed grading. The arrows indicate direction of flow when pools spill. The mounds throughout the site make it so that pools fill independent of each other, but during extreme rain events will connect and flow east to west to the swale that occurs offsite to the west. Proposed pooling depths have been provided in Figure 10c. A comparison between the reference site and the mitigation site with respect to percent of site pooling and depth is provided in Figure 10d. Areas along the existing utility have not been lowered to support pooling to avoid both utility damage and any environmental conflicts if future maintenance is required. The utility corridor, although supporting only shallow electrical utilities is designed to maintain a minimum of 20 foot of width that does not pond water under any rainfall conditions.

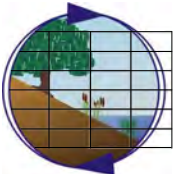
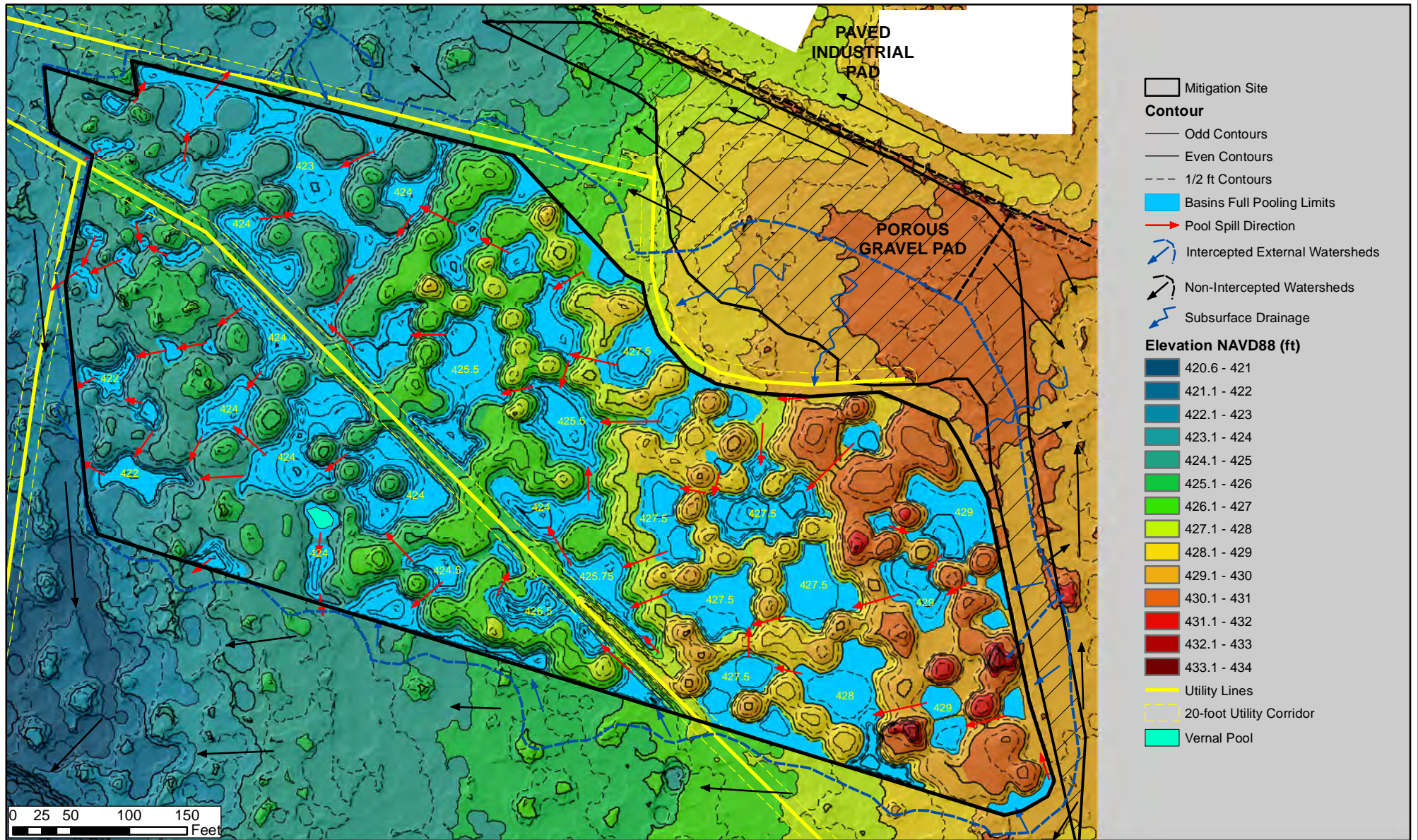
Within the existing chamise chaparral habitat at the west end of the mitigation site, large shrubs (i.e., chamise, scrub oak, laurel sumac) located on tops of mounds will be left intact and depressions between existing mounds will be excavated to depths depicted on the grading plan. This is a different construction approach than for the east side of the site where both mounds and pools will be constructed. The final outcome of the restoration in this area will be a vernal pool/chaparral mosaic that is typical of high quality vernal pool complexes located in the eastern reaches of MYF.

Horizontal control on mounds and pools will be achieved by scaling position within an 80 foot by 80 foot grid staked out on the site. This will assure mound features are located within approximately ± 8 feet horizontal positioning. Conversely, vertical position is much more significant to the design and grades will be held to ± 0.25 foot for basin depths and spillway sills. The site has been designed on a 0.2-foot



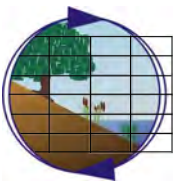
Mitigation Site Existing Topography
Montgomery Field Localizer Antenna Protection Project

Figure 10a



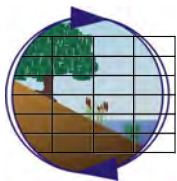
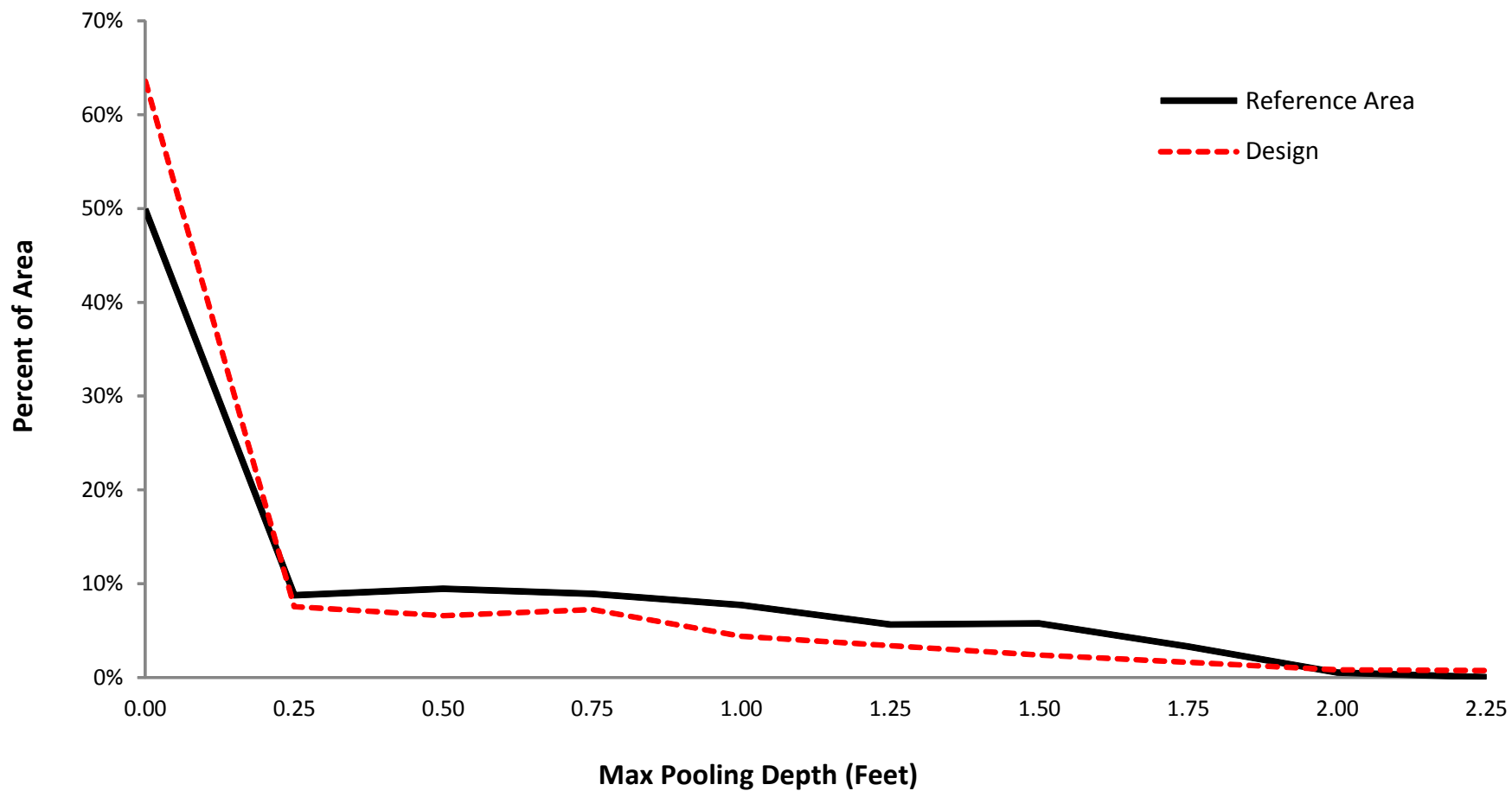
Mitigation Site Proposed Grading and Hydrology Map
Montgomery Field Localizer Antenna Protection Plan

Figure 10b



Reference and Mitigation Site Pool Depths
Montgomery Field Localizer Antenna Protection Project

Figure 10c



**Mitigation Site Pooling Depth Distribution
Compared to Design Reference Pools**
Montgomery Field Localizer Mitigation Plan

Figure 10d

vertical resolution LIDAR grid. The absolute elevation of the LIDAR data are typically of lower accuracy than the intra-dataset relative accuracy. For this reason, an on-site project benchmark will be established and used for all design purposes. This benchmark will be set to the plan set elevation rather than a verified true elevation in order to maintain constructed drainage conditions with surrounding native terrain. Each proposed pool boundary will be marked by the project biologist along with the contractor and the finished basin floor and outflow elevations will be checked with laser survey equipment. The grading plan will be used to guide grading in the field, but the final configuration may differ depending on conditions while grading.

5.3.2 VERNAL POOL CONSTRUCTION

Vernal pool topography will be created by the grading of topographic depressions and mima mound type convex features within the vernal pool mitigation area. The topography has been designed to closely match the reference site which supports San Diego fairy shrimp. Physical characteristics such as depth of pool, area of pool, and the general configuration of the vernal pool/upland community were considered in the design.

5.3.2.2 Grading

The proposed work occurs on a gently sloping plain that drains from northeast to southwest where a north to south running swale occurs offsite to the west (Figures 10a and 10b). The watershed for the proposed pool restoration is bounded by a porous gravel pad to the northeast, and a road to the east of the site. Figure 10a exhibits existing site contours and Figure 10b exhibits proposed grading contours. The overall intent of the grading is to mimic existing high quality vernal pools found in the eastern areas of MYF and in the vicinity of the proposed mitigation site. These pools are formed by relatively steep mounds that rapidly shed water into well defined pool basins. Most pools are designed to be independent but during extreme rain events will connect and flow in a southwestward direction to the offsite swale mentioned above.

Pooling depths are expected to be dependent upon rainfall conditions through the season. As with the impacted vernal pool #34, the pools each achieve a maximum pooling depth and areal extend based on sill elevations that control spilling from one pool to downstream pools until such time as the water ultimately would spill out the pooling basins to the swale along the westerly edge of the mitigation site. For the design

Basin depths range from 0.25 to 2.25 feet (basin full) with most ranging from 0.25 foot to 1.00 foot deep at the spillway elevation. The designed mitigation site has slightly more upland watershed and slightly less pooling depth and volume than does the design reference pool system for an equivalent site area. This was designed in this manner to favor greater pooling potential in the created pools than the reference pools to account for potential minor difference in site porosity in the newly constructed site.

Grading will occur during the summer and fall, prior to seasonal rains. The grading will be conducted under the direction of a qualified biologist with vernal pool restoration experience. Grading will be

implemented using small, earth moving equipment (D4, skid loader with a Gannon box scraper, or smaller equipment). Compaction equipment including a small roller compactor and hand compaction equipment will be used to construct the mounds and to tighten soils in the pool basins. Compaction shall be a minimum of 85 percent unless otherwise adjusted by the project biologist. Material removed from created pool basins will be used to build mima mound topography and enhance drainage to pool areas.

A hand crew with manual landscaping tools such as rakes and shovels will assist in creating final topography. The contractor shall have a project superintendent with demonstrated experience in vernal pool restoration work.

5.3.3 Translocation of Soils

Grading to implement the restoration plan incorporates the translocation of topsoil from existing on-site basins that contain San Diego fairy shrimp cysts. Topsoil from the impacted pool vp #34 was stockpiled on the site during localizer project impacts and will be transferred to the mitigation site and scattered throughout newly constructed pools following final grading (see Section 5.3.2).

5.3.4 Initial Weed Removal

Upland areas that do not require grading work will be weeded using a line trimmer to cut down weeds. This material will be raked and removed from the site. Any new exotic species germinating in the upland areas during the implementation period may be sprayed with a glyphosate based herbicide, though herbicide application should be timed to avoid periods of rain fall as to not impact vernal pool habitat. No herbicide shall be applied within the vernal pool ponding boundaries or while pools are charged; exotic species within ponding areas will be removed by hand.

5.3.4.1 Best Management Practices and Weed Control Implementation

Prior to start of weed removal, the project biologist will oversee exotic species removal procedures and compliance with wetland permit requirements by:

- Coordinating with the City and contractor in the field to review weed removal areas, access flagging, and disposal methods;
- Timing weed removal such that existing weeds do not produce seed.
- Prior to the start of and during weed removal, the contractor shall:
 - Document safe operating procedures, including an emergency clean-up plan, and
 - Clean equipment, shoes, and tools after use in noxious weed infested areas prior to moving to new, uninfested areas.

5.4 Planting Plan

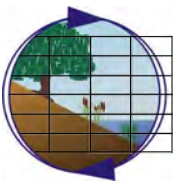
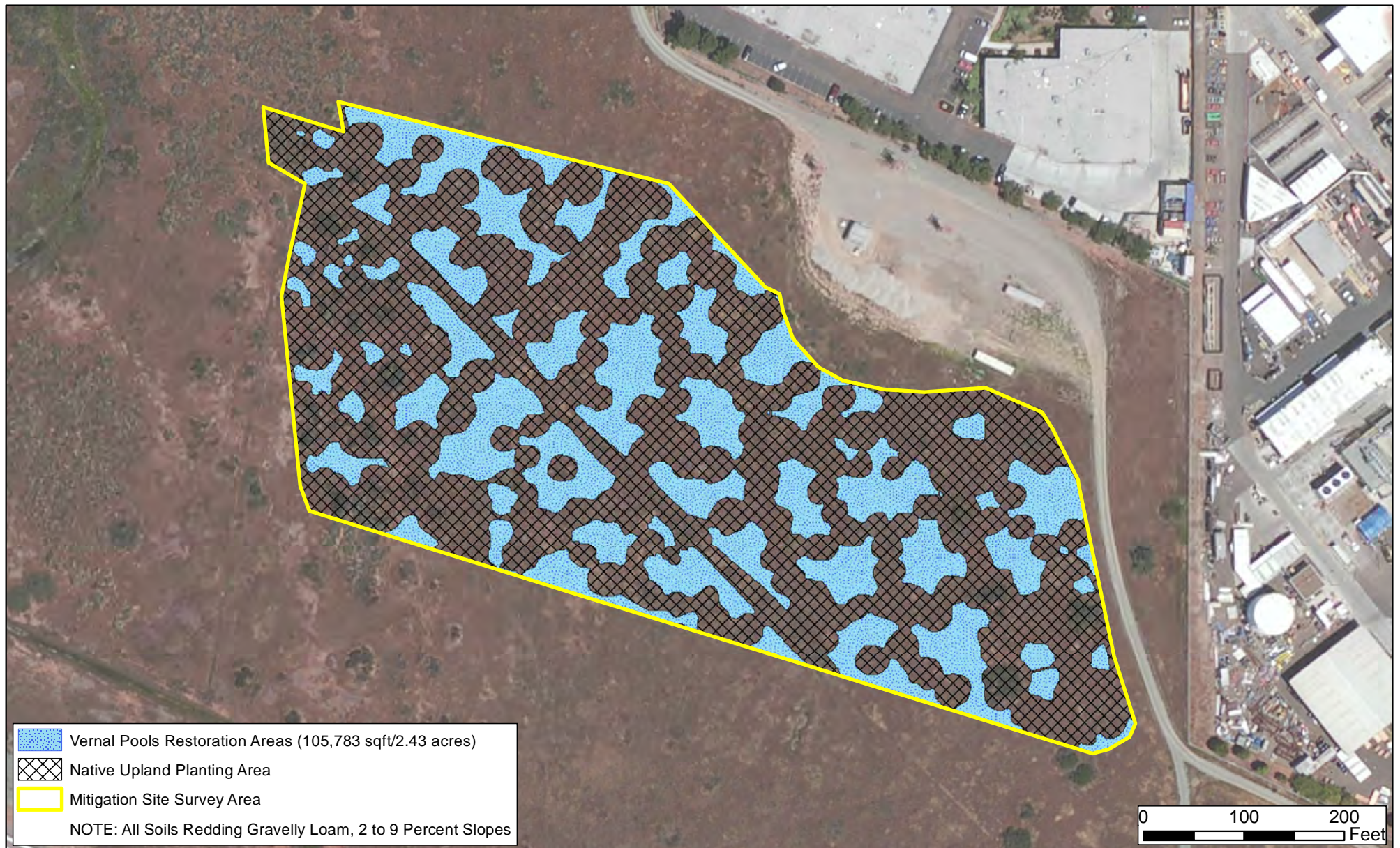
5.4.1 Reintroduction of Vernal Pool Biota

Restoration of the native vernal pool habitats requires the reintroduction of plants and animals at the site in addition to the physical reconstruction within target community-specific portions of the restoration area (Figure 11a). The restoration of vernal pool habitat can be greatly accelerated by the active transport of propagules from donor sites into the restored ponds (Scheidlinger et al. 1985). This will be accomplished by translocation of seeds, spores, bulbs, eggs, and other propagules from previously salvaged material collected from impacted areas of vernal pool #34, as well as other vernal pools on the property. These donor pools will include high quality pools that occur at the eastern end of the airport. No donor pool shall contain versatile fairy shrimp (*Branchinecta lindahl*). Monitoring reports shall document that no versatile fairy shrimp were observed in pools that were selected for cyst collection. Per a conversation between M&A Principal Ecologist, Keith Merkel, and USFWS Biologist, Susan Wynn, on December 10, 2013, vernal pools situated at the east end of the airport would provide the best source for propagule inoculum that is located in the immediate vicinity of the site.

In addition, several piles of mulch occur along the edge of vernal pool #34 (Figure 11b). Piles are approximately 6 inches tall and likely host fairy shrimp cysts. This mulch will be removed and rinsed over screens. The fine fraction passing the sieves would be used as additional inoculum for the created pools. The residual mulch would be properly disposed of off-site. Inoculum will not be installed until the Corps and USFWS have reviewed the restoration grading.

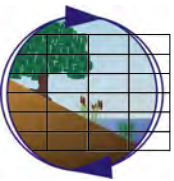
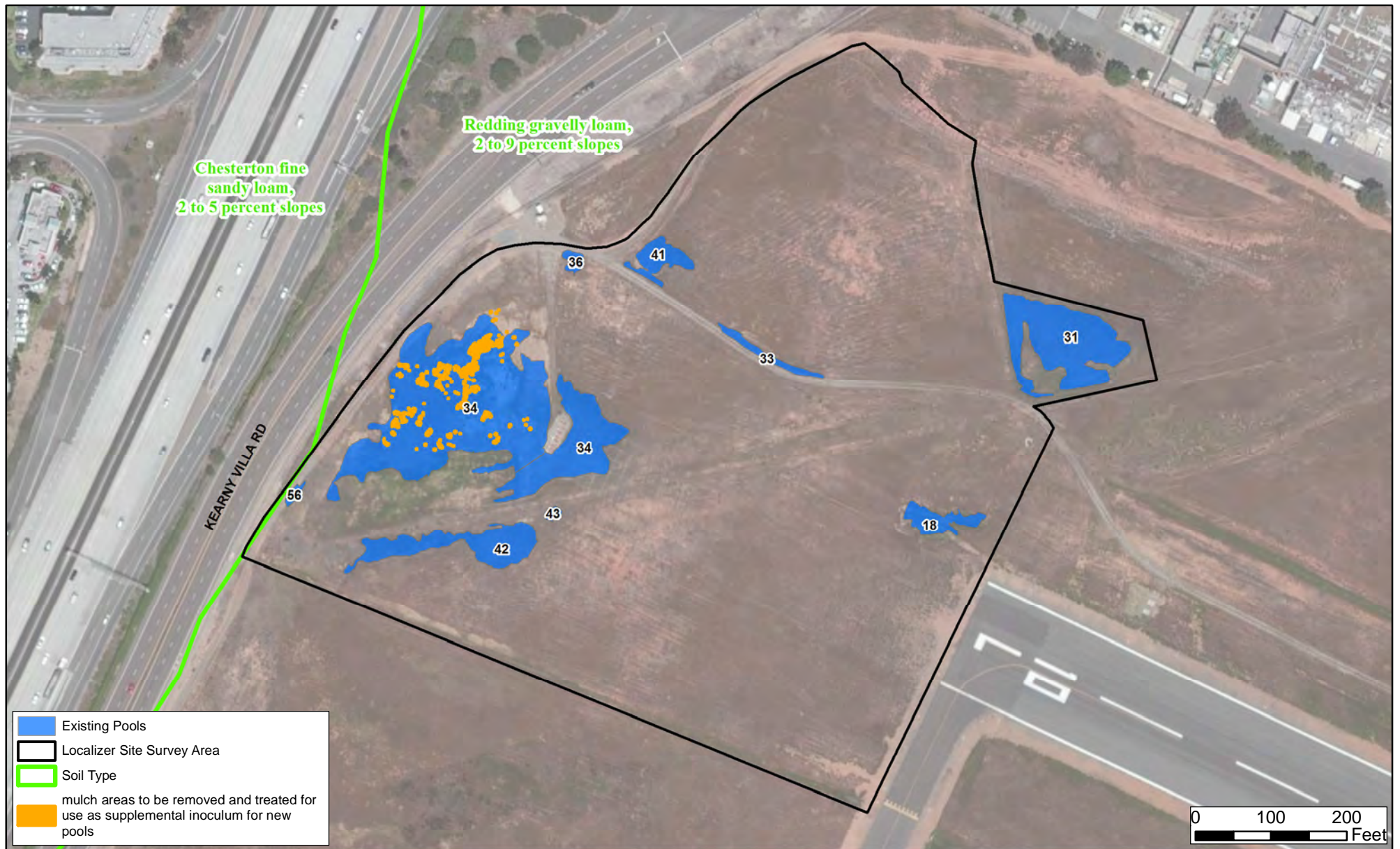
5.4.2 Vernal Pool Topsoil Redistribution and Seed Collection

Vernal pool soils were collected from the impacted portion of vernal pool #34 prior to filling and will be used to inoculate the soils of the created vernal pools. Additional soils for created vernal pool inoculation may be collected from other pools on the airport property, as mentioned above. No more than 10,585 square feet (i.e., 10 percent of the proposed 2.43 acre of restoration area) of native pool area may be used as donor sources for inoculum for the projects initial implementation. No more than 5 percent of any donor pool shall be affected by collection activities.



Vernal Pool Restoration and Upland Planting Areas
Montgomery Field Localizer Antenna Protection Project

Figure 11a



Mulch Removal Areas
Montgomery Field Localizer Antenna Protection Project

Figure 11b

Seed and fairy shrimp cysts shall be collected from donor pools by hand or by using hand held vacuums. A hand trowel or similar instrument will be used to collect sediment containing fairy shrimp cysts. Whenever possible, soil will be collected in blocks. The trowel will be used to pry up intact blocks of sediment (up to three inches by three inches in size) rather than loosening the soil by raking and shoveling, which can damage the cysts. The blocks of soil will be carefully placed within each pool, with the surface of the salvaged soil even with the surface of the restored pool. The chunks of soil from the donor pool will be placed in the deepest portions of the restored pools. The primary source of fairy shrimp will come from the sediment that was previously salvaged within impacted areas of vernal pool #34. Sediment from other donor pools will only be collected if no fairy shrimp are observed following the first monitoring season.

Salvaged inoculum soil will be placed in a manner that preserves, to the maximum extent possible, the orientation of the fairy shrimp cysts within the surface layer of the soil at the bottom of restored pools. This will result in the greatest chance for the material to be inundated during the rainy season. Cyst inoculum will not be installed within the restoration area until the pools have been demonstrated to retain water for the appropriate amount of time to support San Diego fairy shrimp.

Species proposed for introduction to the site will be considered to be indicative of vernal pool habitat quality and likely to have formerly occupied pool #34 prior to disturbance by placement of wood mulch and the crushed rock of the localizer pad.

5.4.3 Establishment of Vernal Pool Target Species

The final objective for the mitigation plan will include the establishment of populations of at least five vernal pool species within the created vernal pool complex. Vernal pool species are those identified in Zedler (1987). Seed propagules are anticipated to be introduced through salvage of inoculum as well as some focused direct seeding by more common species (below).

Following completion of grading activities, the created (i.e., restored) vernal pools will be inoculated with species listed in Table 3 as they are available from donor sites. Seed for inoculation will come from the plants that occur in donor pools mentioned above.

**TABLE 3
SEEDING LIST FOR VERNAL POOL RESTORATION AREA**

Scientific Name	Common Name
<i>Crassula aquatica</i>	Water pygmyweed
<i>Juncus bufonius</i>	Toad rush
<i>Plantago bigelovii</i>	Bigelow's plantain
<i>Plagiobothrys acanthocarpus</i>	Adobe allocarya
<i>Psilocarphus brevissimus</i> var. <i>brevissimus</i>	Dwarf-wooly heads

Vernal pools to be restored (i.e., created) should provide hydrologic conditions suitable for San Diego fairy shrimp. All will be inoculated with San Diego fairy shrimp following restoration. Soil, cyst, or adult shrimp for the inoculation of San Diego fairy shrimp will come from the salvaged topsoil from the impacted

portion of vernal pool #34, and other natural vernal pools containing San Diego fairy shrimp located on the MYF.

5.4.4 Native Upland Restoration

Upland grassland restoration will mitigate for impacts to non-native grassland that was incurred by the localizer project. The required acreage for non-native grassland mitigation is 0.65 acre. All upland areas within the mitigation area will be seeded with native plant species, targeting restoration of native grassland habitats. However, the mitigation obligation shall be set at achieving either native grassland or non-native grassland habitat over 0.65 acre of the restoration site. Although the entire upland seeded/planted area is approximately 4.5 acres (necessary to generate adequate watershed to support the vernal pool restoration), only 0.65 acre of the uplands is required to establish and meet prescribed success standards for upland habitat mitigation. The upland restoration area for the project will be targeted for restoration of native, low growing herbaceous species.

Where feasible, upland restoration procedures will use seed and plant materials taken from coastal areas within 20 miles of the project site. The restoration of a upland community to this site will be based on a principle of controlling exotic weeds and reestablishing suitable edaphic conditions, including mycorrhizal fungi, and native seed banks.

Plant establishment techniques will include hand-broadcast of collected local seed. Seeding rates of species to be included are presented in Table 4.

TABLE 4
SEED MIX AND APPLICATION RATES FOR THE NATIVE UPLAND RESTORATION AREA

Scientific Name	Common Name	Application Rate (pounds/acre)
<i>Deinandra fasciculata</i>	Golden tarplant	1.0
<i>Gnaphalium californicum</i>	Green everlasting	0.5
<i>Holocarpha virgata</i> ssp. <i>elongata</i>	Graceful tar plant	1.5
<i>Acmispon scoparius</i>	Deerweed	0.5
<i>Lupinus succulentus</i>	Arroyo lupine	0.5
<i>Stipa pulchra</i>	Purple needlegrass	2.5
<i>Sisyrinchium bellum</i>	Blue-eyed grass	1.0

Seeding will be timed to follow natural rain events to ensure adequate soil moisture. A water truck (i.e., water buffalo) may be used for supplying supplemental water during the rainy season to facilitate establishment.

Any changes to the proposed plant palette will be determined by the project biologist and approved by the City of San Diego.

In addition, corms of San Diego goldenstars will be salvaged by hand from the mitigation area and stored in a cool dry environment until after grading is completed. After grading, the corms will be reintroduced to

the site within non-pooling areas, as directed by the project biologist. An estimated total of 22 plants were identified on the site and will be replanted at the same approximate depth from which they are salvaged.

5.4.4.1 Native Upland Seed

A seed mix, consisting of native, low-growing herbaceous native upland species, will be applied to the native upland restoration area (Table 4). Seed will be acquired from a reputable seed collector or commercial supplier (e.g., S&S Seeds). Any changes to the proposed seed mix for the project must be approved by the project biologist.

5.4.4.2 Seed Application

Plant establishment techniques will include hand-broadcast or hydroseeding of collected seed with the plants listed in Table 4. This plant palette is composed of native herbaceous plants found in adjacent uplands that meet airport mowing requirements. Typically, seed should be applied at the onset of winter rains (October–November). This schedule may be modified by mutual agreement between the contractor, City, and the project biologist if variation in seasonal rainfall.

6.0 Maintenance and Monitoring Program

The objectives of the maintenance and monitoring program are to ensure successful establishment of pools, grassland, and fairy shrimp populations within the mitigation site. In addition the program is to document the maintenance and monitoring efforts conducted at the site and provide a means of tracking the progression of habitat development through time, to provide an indicator of expectation of long-term site success. To achieve these objectives, the project biologist will observe and direct revegetation implementation, maintenance, and monitoring activities and will document the results of these efforts.

6.1 Reference Site for Revegetation Specifications

The pools used to design the restoration site will serve as the reference pools for this project (Figure 12).

6.1.1 Reference Pool Hydrology

Information pertaining to pool hydrology including maximum depth and inundation period will be recorded at the reference pools during each quantitative monitoring visit. Baseline information from the reference pools will be obtained during the previous winter/spring period, prior to implementation of this mitigation project. Information gathered from the reference pools will be used to compare with restored pools, in an effort to determine project success.

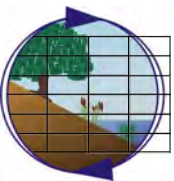
6.1.2 Reference Pool Fairy Shrimp

A fairy shrimp survey will be conducted at the reference pools during the winter/spring season prior to implementation of this mitigation plan, in order to obtain current data regarding fairy shrimp at the reference pools.

6.1.3 Reference Pool Vegetation

6.1.3.1 Vernal Pools

Vernal pool species typical of MYF include dwarf wooly-heads (*Psilocarphus brevissimus*) water pygmyweed (*Crassula aquatica*), toad rush, and Bigelow's plantain (*Plantago bigelovii*). Exotic species previously reported within MYF pools have been African brass buttons (*Cotula coronopifolia*) and grass poly (*Lythrum hyssopifolia*). A survey within the reference pools will be conducted during the winter/spring prior to the implementation of this plan to determine the current flora of these pools. This information is subsequently used to establish a reference site baseline.



Reference and Donor Pool Locations in Relation to the Mitigation Area
Montgomery Field Localizer Antenna Protection Project

Figure 12

6.2 120-Day Plant Establishment Period

To ensure that conditions of this revegetation plan are adhered to, all implementation activities will be monitored and recorded by the project biologist. The biologist will be available on-site during grading and revegetation implementation to assist in making necessary plan modifications so that the work may proceed. Records kept will include dates of seeding and planting and any significant problems encountered or necessary changes.

A 120-day plant establishment period (PEP) will commence upon seeding in the active restoration areas. During this period, relatively intensive maintenance activities will be conducted to aid in the establishment of the restoration under the direction of the restoration biologist. The maintenance crew will control emerging weed seedlings and remove any trash from the restoration sites. Weeding of the site will occur monthly during the PEP unless directed by the project biologist. A 120-day PEP letter will be submitted to the City of San Diego and to the applicable jurisdictions.

6.3 General Maintenance Procedures

6.3.1 Weed Control

Weeds will be controlled throughout the PEP and five-year maintenance and monitoring period for the vernal pool and native upland restoration areas. Hand weeding or other weed control methods will be performed by maintenance workers familiar with and trained to distinguish weeds from native vernal pool and upland species. No herbicides will be used within vernal pool habitat or their immediate watersheds. The project biologist will supervise the maintenance workers. The project biologist may adjust scheduling with rainfall patterns to maximize weeding effort in wet or dry years. The revegetation areas will be weeded monthly during the spring of Years 1 through 5 unless directed otherwise by the project biologist. During the remainder of the first year, workers will weed the site quarterly (or more often as determined by the project biologist) to keep weeds from producing seeds and to control weed competition during the establishment period of native plants. Table 5 summarizes typical weed species detected within MYF vernal pools and adjacent upland areas.

TABLE 5
ANTICIPATED EXOTIC AND WEEDY HERBACIOUS PLANT SPECIES

Scientific Name	Common Name
<i>Atriplex semibaccata</i>	Australian saltbush
<i>Avena barbata</i>	Slender wild oat
<i>Brassica nigra</i>	Black mustard
<i>Bromus diandrus</i>	Ripgut brome grass
<i>Carpobrotus edulis</i>	Hottentot fig
<i>Chrysanthemum coronarium</i>	Crown daisy
<i>Conyza bonariensis</i>	Flax-leaf fleabane
<i>Conyza canadensis</i>	Horseweed
<i>Cotula coronopifolia</i>	Brass buttons
<i>Cynodon dactylon</i>	Bermuda grass
<i>Erodium botrys</i>	Filaree, storksbill
<i>Foeniculum vulgare</i>	Sweet fennel
<i>Lactuca serriola</i>	Prickly lettuce
<i>Festuca perennis</i>	Ryegrass
<i>Malva parviflora</i>	Little mallow
<i>Medicago polymorpha</i>	California burclover
<i>Melilotus indica</i>	Sourclover
<i>Helminthotheca echioides</i>	Bristly ox-tongue
<i>Ricinus communis</i>	Castor bean
<i>Salsola tragus</i>	Russian thistle
<i>Silybum marianum</i>	Milk thistle
<i>Sonchus asper</i>	Prickly sow thistle

6.4 Long-Term Maintenance

The maintenance period for the revegetation areas will begin immediately upon completion of the 120-day PEP and last for a total of five years. Maintenance will include remedial actions such as weed control, site protection, and if necessary, reseeding and replanting. Maintenance measures will be conducted by the landscape contractor under the supervision of the project biologist as outlined below.

6.5 Long-Term Monitoring

The monitoring program shall include qualitative and quantitative sampling in both restored and the design reference pools. Table 6 outlines the monitoring schedule. Hydrologic and water quality, vegetation, and fairy shrimp sampling will be conducted within the mitigation and reference areas.

Metrics for success (outlined in Section 6.7) are to be based on how the mitigation site performs relative to the performance of the natural reference pools and upland grassland habitats. The reference pools will provide a control for natural variability in rainfall and plant development as well as pooling depth and duration and fairy shrimp emergence and reproductive conditions. Assessment of project success metrics and objectives satisfaction will be based on achieving similarity in mitigation site performance relative to that of the intact natural reference areas.

**TABLE 6
MAINTENANCE AND MONITORING SCHEDULE***

Type/Task	120-PEP	Monitoring: Year 1	Monitoring: Year 2	Monitoring: Year 3	Monitoring: Year 4	Monitoring: Year 5
Maintenance						
Weed control	Monthly during Spring months	Monthly during Spring months	Monthly during Spring months	Monthly during Spring months	Monthly during Spring months	One final maintenance effort following final monitoring visit
Reseeding	--	Fall	Fall	--	--	--
Monitoring						
Qualitative	Monthly	Quarterly	Quarterly	Quarterly	Quarterly	Quarterly
Quantitative	—	Once during Spring Season	Once during Spring Season	Once during Spring Season	Once during Spring Season	Once during Spring Season
Hydrological	Weekly following rain events >0.5 in until dry	Weekly following rain events >0.5 in until dry	Weekly following rain events >0.5 in until dry	Weekly following rain events >0.5 in until dry	Weekly following rain events >0.5 in until dry	Weekly following rain events >0.5 in until dry
Fairy Shrimp** (to be compared to and sampled concurrent with design reference pools)	Wet season: Presence and frequency of hatched fairy shrimp and gravid females	Wet season: Presence and frequency of hatched fairy shrimp and gravid females	Wet season: Presence and frequency of hatched fairy shrimp and gravid females	Wet season: Presence and frequency of hatched fairy shrimp and gravid females	Wet season: Presence and frequency of hatched fairy shrimp and gravid females	Wet season: Presence and frequency of hatched fairy shrimp and gravid females

* Approximate. Schedule may be adjusted by project biologist for rainfall

** If pooling does not occur during a given season, then dry season surveys and hydration may be conducted to verify the persistence of viable cysts during the monitoring year.

6.5.1 Qualitative Vegetation Monitoring

The project biologist will monitor all phases of implementation and maintenance during the maintenance and monitoring period. The biologist will examine the status of the sites at least monthly during the first and second years of the project and quarterly thereafter. Observation of weed infestations, native plant health, and seed germination will be recorded. In addition, the monitor will assess the successful establishment of vernal pool hydrology within areas of topographic reconstruction. The results of these surveys will be reported to the City.

6.5.2 Quantitative Vegetation Monitoring

A complete floral inventory of each restored pool will be conducted in the spring of each year. Species occurring in each pool will be recorded, and vegetation cover of vernal pool and exotic species cover will be estimated. This survey will allow the biologist to determine if the pools support vernal pool species and sensitive species.

6.5.3 Hydrological Monitoring

The depth and duration of water in these temporal ponds is highly dependent upon the magnitude and number of storm events, the time interval between each event, and the climactic determinants of evaporation and transpiration (temperature, humidity, sunlight, and winds) between each storm event. Therefore, the success criteria for hydrological characteristics also depend on a comparison with the design reference pools, which establishes the depth and persistence performance goals for the restored pools during each monitoring year.

6.5.3.1 Water Source/Watershed Analysis

The site is intended to be a non-irrigated habitat restoration. However, during the first year of establishment, limited supplemental watering may be used during the rainy season to facilitate establishment of upland plants from seed. Irrigation will not be used to charge pooling basins after inoculum has been introduced to the basins. Water draining into the restored vernal pools on the mitigation site will be limited to natural rainfall and runoff from the local basin watersheds. Monitoring of water sources will be limited to annual inspection during the wet season to determine if any alterations of the drainage patterns or pool watersheds have been made to surrounding lands that would adversely affect the pool system performance.

6.5.3.2 Duration, Periodicity, and Depth of Inundation

- Vernal pools will be monitored to record water depth over the low point in each restored and reference basin during the course of five rainy seasons following restoration. From this data, a water depth–time curve will be prepared for each basin illustrating depth and duration of inundation.

- Each monitored pool will be measured for water depth every week following a storm event depositing more than 0.5 inch of rain, as indicated by a rain gauge on-site, until the standing water is gone. Water depth will be measured using a vertical staff gauge placed in the deepest part of the pool.
- Prior to the end of the monitoring period, restored pools will demonstrate hydrological patterns of duration, periodicity, and water depth, which fall within the range of variation observed in the coincidentally monitored reference pools.

6.5.3.3 Fairy Shrimp Monitoring

Fairy shrimp and habitat suitability monitoring will include the following:

- Wet field samples will be taken in the mitigation and reference pools to determine the presence of hatched fairy shrimp and gravid females. Sampled fairy shrimp will be released in the sampled pools, however some individuals will be collected and returned to the lab for verification of absence of versatile fairy shrimp (lab collections shall only be performed once per season and shall not harvest more than an estimated 2 percent of the fairy shrimp from any pool. Because versatile fairy shrimp are not known from these pools, monitoring will be limited to only sub-sampling with the expectation that if versatile fairy shrimp do occur, they will eventually be collected through this effort.
- Concurrent with fairy shrimp sampling, water quality measurements will be taken in the restored pools and reference pools to determine the parameters of pH, temperature, total dissolved solids, and salinity at the pooling depth monitoring locations in the deepest area of the pools.
- If no fairy shrimp emergence occurs during two consecutive wet seasons, dry samples will be taken in the restored pools to determine the presence or absence of viable cysts in the soil. This will only be performed where pools ponded for a depth and duration long enough to support fairy shrimp, but no fairy shrimp emerged, even though fairy shrimp emerged in the reference pools during the same period.

6.6 Monitoring Reports

At the end of the first four months of Year 1, a report summarizing the installation and maintenance activities and monitoring results will be submitted to the City (Airports, Engineering & Capital Projects, and Development Services Mitigation Monitoring Coordinator), ACOE, USFWS, and RWQCB.

At the end of each monitoring year, monitoring reports will be submitted to the City (Airports, Engineering & Capital Projects, and Development Services Mitigation Monitoring Coordinator), ACOE, USFWS, and RWQCB. The final annual report will include the results and analysis of the quantitative and qualitative monitoring surveys, including results and discussions for both the flora and fauna observed and recorded

for the project site. The reports will include any recommended remedial actions and photo documentation. Each report will compare findings of the current conditions with those in previous reports.

6.6 Performance Standards

6.6.1 Vernal Pool

At the time of impact by the Localizer pad, vernal pool #34 was at spill elevations and thus maximum pool extent. An impact of 0.19 acre occurred with the requirement that impacts be mitigated at a 5:1 ratio – a pool area of 0.95 acre. Impacted areas of vernal pool #34 supported San Diego fairy shrimp and four common native vernal pool indicator plants, and *Lythrum hyssopifolium*, an invasive exotic species. The goal of the mitigation for vernal pool impacts is to offset the unavoidable impacts of the Localizer pad project at a scale meeting the compensation ratio ascribed. To evaluate the success of this effort, multiple assessment standards and performance metrics have been developed.

Standard 1: Mitigation vernal pools shall support ponding, vernal pool indicator plants, and San Diego fairy shrimp occupancy in a manner comparable to the design reference pools.

This means that in some years pools may fill to greater or lesser levels and in some years all or portions of the pools may be dry as a result of variability in natural rainfall cycles. The determination as to what natural pooling cycles and duration is to be based on performance of design reference pools. These pools are regarded as some of the most intact vernal pools on Kearny Mesa and have been selected both to guide the design of the site and to serve as hydrologic and biological reference pools to establish performance expectations for the vernal pool mitigation.

Vernal Pool Hydrology

- *Performance Metric 1-1 (Vernal Pool Hydrology): At least as many pool basins shall support ponding within the mitigation site as within the reference site during any given season for post-restoration monitoring years 3, 4, and 5.*
- *Performance Metric 1-2 (Vernal Pool Hydrology): The average maximum depth of pools that hold water within the mitigation site (based on deepest point measurement) shall not be significantly different ($p=0.05$) than pools that hold water within the reference site during for post-restoration monitoring years 3, 4, and 5.*
- *Performance Metric 1-3 (Vernal Pool Hydrology): The average duration of pooling within the mitigation site (based on weeks of pooling for an equivalent number of mitigation pools as hold water in the reference site) shall not be significantly different ($p<0.05$) between the mitigation site and the reference site during for post-restoration monitoring years 3, 4, and 5.*

Vernal Pool Flora

- *Performance Metric 1-4 (Vernal Pool Flora): A minimum four species of native vernal pool indicator plants shall occur within the mitigation pool complex for each of the post-restoration monitoring years 3, 4, and 5, except that this number may be diminished equivalently if during a given year the number of species of native vernal pool indicators within the reference pool complex declines below four.*
- *Performance Metric 1-5 (Vernal Pool Flora): Vernal pool floral species shall not occur in fewer than 1.64 times as many pool basins during any given year than occurring within the reference site during each of the post-restoration monitoring years 3, 4, and 5.*
- *Performance Metric 1-6 (Vernal Pool Flora): The mean total absolute vegetative cover, within vernal pool basins in the mitigation area shall not statistically differ by more than 20 percent from that represented in the reference pools ($p > 0.05$) during each of the post-restoration monitoring years 3, 4, and 5.*
- *Performance Metric 1-7 (Vernal Pool Flora): Vernal pool invasive species (e.g., loose-strife (*Lythrum hyssopifolia*), filaree (*Erodium botrys*), sand-spurrey (*Spergularia bocconii*), curly dock, common knotweed (*Polygonum arenastrum*), rabbitfoot grass (*Polypogon monspeliensis*), and ryegrass (*Festuca perennis*)) shall not occur at a significantly greater density ($p < 0.05$) within the mitigation pools as the reference pools during post-restoration monitoring years 3, 4, and 5.*

Vernal Pool Fauna

- *Performance Metric 1-8 (Vernal Pool Fauna): Swimming adult San Diego fairy shrimp shall occur in an equivalent or greater number of mitigation pools as reference pools during three of the five post-restoration monitoring years.*
- *Performance Metric 1-9 (Vernal Pool Fauna): The number of pools supporting gravid female shrimp must not be less than the reference pools for at least, three wet seasons before a determination of success can be made.*
- *Performance Metric 1-10 (Vernal Pool Fauna): During any given year, versatile fairy shrimp shall not occur within mitigation site pools at a greater rate than reference pools (at present, versatile fairy shrimp are not believed to be in the MYF pools). Evaluation shall be based on subsampling of adult swimming fairy shrimp during each monitoring year rather than an intensive collection of fairy shrimp.*
- *Performance Metric 1-11 (Vernal Pool Fauna): The target indicator wildlife species listed in Table 7 include species that are found primarily in natural vernal pools and associated habitat within the region and are therefore considered indicators of habitat quality and restoration success. The restored vernal pools shall support populations of San Diego fairy shrimp as described above and some of the pools shall support at least one of the other native species listed in Table 7.*

TABLE 7. TARGET WILDLIFE INDICATOR SPECIES

Group	Species
Anostraca	<i>Branchinecta sandiegonensis</i> (San Diego fairy shrimp)
Conchostraca	<i>Cyzicus</i> sp. (clam shrimp)
Ostracoda	<i>Bradleyocypris</i> sp., <i>Eucypris</i> sp., <i>Heterocypris</i> sp., <i>Lymnocythere</i> sp., <i>Pseudoilicypris</i> sp. (seed shrimp)

Standard 2: The vernal pool mitigation shall achieve 0.95 acre or greater of pool surface area at peak pooling conditions and shall be proportional in pooling area to reference pools during any given year.

The reference pools are capable of pooling to a maximum surface area of 0.58 acre prior to exceeding pool sill elevations and running out of the reference area. The mitigation areas must therefore be capable of achieving 1.64 times (0.95 acres/0.58 acres) the maximum pooling area of the reference area. The design pooling basin scale for the mitigation site would support pooling to a maximum of 2.43 acres (2.56 times the maximum mitigation pool requirement). The mitigation site has been expanded over that specifically required in order to guard against shortfalls due to inadequate watershed for some pools, inadequate construction compaction on some basins, low sills that prevent the design pooling from being achieved, or vegetation overrun of some of the basins that render them inadequate to achieve the target objective.

- *Performance Metric 2-1 (Vernal Pool Area): Upon completion of mitigation grading, a maximum pooling area map shall be prepared for the mitigation site by determining the sill elevations of each pool basin and surveying the sill elevation contour around each basin. The total maximum pool area shall under no circumstances be less than 1.9 acres (2 times the minimum required).*
- *Performance Metric 2-2 (Vernal Pool Area): To verify adequacy of vernal pool sizing, a minimum area of at least 1.64 times as much pool area must be achieved within the mitigation site as within the reference site during post-restoration monitoring years 3, 4, and 5.*

6.6.2 Upland Mitigation

The Localizer project resulted in impacts to 1.25 acre of non-native grassland requiring conservation of 0.65 acre of non-native or native grassland within an MHPA as mitigation. The restoration of vernal pools on site requires the development of both pooling basins and micro-watersheds to the pools that are comprised of mima mounds supporting a combination of existing chaparral to be maintained through restoration, and restored grassland habitats. In order to effectively conserve the mitigation vernal pools requires conservation of the mounds within the mitigation site as well. For this reason, upland grassland mitigation is to be satisfied by conservation of 0.65 acre of restored non-native or native grassland habitat within the vernal pool mitigation site.

This mitigation plan targets the restoration of native grassland habitat within the uplands integrated throughout the vernal pool basins. However, the performance standards for mitigation success for upland

habitat impacts are lower, requiring only the conservation of non-native grasslands. The difference between restoration objective and mitigation requirement should not be lost in the evaluation of success, nor should it temper the management and maintenance practices in pursuit of the restoration goals.

Standard 3: Upland restoration of mima mound topography within the mitigation area shall result in not less than 0.65 acre of conserved grassland (non-native or native) that is similar or of higher quality than that occurring adjacent to the mitigation site.

- *Performance Metric 3-1 (Grassland Mitigation): Mitigation grasslands shall be established within a minimum of 0.65 acre of uplands within the vernal pool mitigation site. This shall be documented based on vegetation mapping conducted on the site during post-restoration monitoring year 5. Areas that are mapped as either non-native or native grasslands may be used to satisfy this metric, however the mapping shall be performed in a manner that distinguishes between the two grassland types during each mapping year.*
- *Performance Metric 3-2 (Grassland Mitigation): During post-restoration monitoring years 3 and 5, mitigation grasslands shall be of a similar cover to adjacent intact non-native grassland vegetation located immediately south of the mitigation site. Alternatively, if native-grasslands are established, cover criteria shall be based on similarity to native grassland habitat on the MYF at a location to be determined.*

Two reference transects will be established within intact non-native grassland vegetation located immediately south of the mitigation site. A minimum of two transects will be established in upland areas of the mitigation site for the purpose of comparing species coverage and invasive species conditions with the reference transect. Of the 4.5-acre area that is seeded, a total of 0.65 acre will be required to meet the following target values.

Year 1: 20 percent cover of that reflected in reference transects
Year 2: 40 percent cover of that reflected in reference transects
Year 3: 60 percent cover of that reflected in reference transects
Year 4: 80 percent cover of that reflected in reference transects
Year 5: 90 percent cover of that reflected in reference transects

- *Performance Metric 3-3 (Grassland Mitigation): During post-restoration monitoring years 1 through 5, mitigation grasslands shall support equivalent or lesser percent cover of non-native invasive species on monitoring transects as reflected on reference transects.*
- *Performance Metric 3-4 (Grassland Mitigation): Invasive weed species, defined as those species that have the potential to become established as permanent detractive elements of the plant community, shall not exceed an absolute relative cover value of 5% for monitoring years 3 through 5.*

7.0 Remediation Measures

If the minimum levels for any one of these performance measurements are not achieved, the project biologist will recommend remedial actions (such as replanting and/or seeding) to reach the following year's expected levels. If, at the end of five years and 120 days, the revegetation areas fail to meet the standards for a minimum of 0.65 acre of area within the mitigation area, the monitoring and maintenance period may be extended an additional year and a specific set of remedial measures will be implemented per the direction of the biologist in coordination with the City, ACOE, and USFWS. Only areas that fail to meet the success standards shall require additional work and remedial measures. This process will continue until the final standards are met or until the City, ACOE and USFWS determine that other measures are appropriate. Remedial measures will be implemented in coordination with the City of San Diego Airports, Engineering and Development Services Mitigation Monitoring Coordinator, and appropriate resource agencies.

As mentioned previously, this mitigation plan proposes vernal pool and non-native grassland habitat acreage that is in excess of the required mitigation. At the end of the maintenance and monitoring period, any additional restored/created habitat that is beyond the MYF Localizer mitigation requirement will be reviewed and contemplated by the City and the Resource Agencies for potential application in the mitigation for other City projects.

8.0 Completion of Mitigation Notification

When the project performance standards have been met, or other remedial measures agreed upon by the project biologist, City of San Diego Airports, Engineering and Development Services Mitigation Monitoring Coordinator, and resource agencies have been completed and approved, a Notice of Completion of Mitigation will be issued to the Landscape Contractor to signify the completion of the Landscape Contractor's responsibility for the project. In addition, a Notice of Completion will be sent to all responsible resource Agencies (ACOE, RWQCB, etc.).

9.0 Long-term Site Management

Long-term management of the mitigation site shall comply with the Montgomery Field Airport Management Plan (P&D Environmental 1998). Specific management recommendations for vernal pools and upland habitats are provided in this document and shall be adhered to within the mitigation area. Both general and specific management recommendations are identified in Section 6.0 of the plan. Pertinent recommendations are summarized below with specifics provided that relate to the mitigation site. The following information was contemplated regarding preserve design with updated information provided where applicable:

- **Established Buffer Zones:** In an ideal situation a buffer zone would be established around a preserve that would functionally eliminate negative impacts within the preserve and the need to manage the preserved resource. Only the buffer zone would require management and the preserve would function naturally. MYF is surrounded by urban development thus eliminating the presence of a viable buffer zone. As such, the MYF Management Plan recognizes that fully establishing a buffer zone that would eliminate human impacts on the preserve area is impossible and therefore the preserve must be managed to mitigate both past and the inevitable future impacts of human activity on MYF. For the localizer project mitigation, the mitigation site is located a minimum of 60 feet from the security fenced boundary of the MYF and is separated from the boundary of the site by a security road, FAA gravel pad, and some grassland habitat areas. No drainage from the off-site industrial yards flows into the mitigation site.
- **Intact Boundaries:** The Management Plan mentions that the fencing of MYF does not effectively eliminate unwanted intrusion into the natural resource protection areas. It mentions, that on every occasion when the site was visited by P&D staff there were other persons (i.e., joggers, kids on bikes, people with unleashed dogs) in the sensitive habitat areas. It should be noted that Merkel & Associates staff have never observed trespass on the property since their initial involvement of the site in January of 2011. It is presumed that security fencing and other access restrictions have been bolstered since the preparation of the Management Plan in 1998 and in response to heightened security requirements for commercial airport facilities. At present, the perimeter security fencing surrounding the airfield is adequate to provide boundary control and the prevention of trespass is uniformly in alignment with the goals and requirements of the airport operations. No additional fencing is proposed for the mitigation site.
- **Reduction/Elimination of Future Damage:** The plan recognizes that the damage that has been done to the natural resources on MYF has been as a result of historic airport development. Currently, airport practices have been substantially limited for new capital projects and maintenance has become more clearly established thus reducing the scope and potential for new unregulated resource damage. For the present mitigation site, identification of the preferred mitigation area location has been the result of balancing aviation needs on the MYF with goals of selecting optimal areas for the restoration to be conducted. This has resulted in selection of a site with one conflicting use, an electric utility to the airport landing light system that runs

diagonally through the mitigation site between the lights and the control tower. To avoid any future conflicts, a 20-foot wide utility corridor has been excluded from the mitigation site and the elevation of the corridor has been maintained above any pooling depths such that potential future maintenance or utility replacement could be achieved without conflict with the mitigation pools.

- **Restoration from Previous Damage:** The Management Plan discusses the potential for vernal pool restoration in areas west of the runways. Although considered, these areas were dismissed following discussions with the ACOE, USFWS, and FAA. It was determined that the original proposed location at the west end of the runway did not afford the desired protection from possible additional expansion of the Localizer, conflicted with Runway Protection Zone (RPZ) needs, and due to design needs to generate increased runoff to pools by mounding, would adversely affect runway safety. As a result of these factors, the westerly mitigation area was discouraged by the ACOE and USFWS, and rejected by FAA. In addition, the agencies preferred a vernal pool complex with a greater size and density of mima mounds, as found at the eastern end of MYF. As a result, the siting of the mitigation area reflects a desire to optimize success of the restoration in an area that minimizes conflicts with airport uses and requirements. This has resulted in moving the mitigation area away from vernal pool #34 that was impacted by the Localizer project and prior wood mulch fills. However, as an element of the mitigation program, deep deposits of wood mulch fill located within vernal pool #34 will be removed and screened for fairy shrimp cysts to use as inoculum for the mitigation pools. This will result in both providing a good source of fairy shrimp cysts and removing wood mulch from the previously damaged pool.
- **Viable Habitat Linkages:** The Management Plan mentions the fact that residential and commercial development completely surrounds MYF, eliminating any linkages to similar habitat offsite. However, vernal pools are primarily linked to one another by migratory waterfowl and hydrologic interfaces during extreme rainfall periods. In this respect, the MYF pools including the new proposed pools are expected to be linked with pools on the MYF and would contribute to maintenance of this pool complex through time.

The Management Plan also provides information regarding controlling threats to vernal pools:

- direct physical damage from unauthorized activities,
- direct physical damage from authorized routine or emergency airport operations,
- indirect damage from offsite contaminants of the water supply,
- indirect damage from contaminants originating on MYF, and
- potential loss of vernal pools through airport property development.

As mentioned previously, unauthorized access to the site has been greatly minimized since the development of the Management Plan. In regard to authorized work within MYF, vehicles will continue to be restricted to the existing roads. No mowing is expected to occur within the mitigation area since mowing is restricted to areas between runways and within 50 feet of the runways, as specified in the Management Plan. Per this plan, pools that are temporarily damaged by emergency work will be restored to as near their original conditions as practicable. Emergencies involving fuel spills will be part of

the emergency response and the cleanup will be directed by a City or County hazardous materials team. According to the Management Plan, visual inspection of the MYF watercourses are conducted twice during the dry season, once per month during the wet season, and within one-half hour of the onset of a runoff event during daylight hours. MYF will attempt to follow the pollutant trail to the point where it enters the airport property and notify the appropriate biologist who will contact the pertinent resource and regulatory agencies. It should be noted that no drainages outfall onto the mitigation site. In addition, no adjacent properties contribute to the watershed of the mitigation site. A portion of the FAA maintenance pad along the northern boundary of the mitigation site occurs within the mitigation site's watershed. There is a potential for indirect damage from contaminants from this area and therefore periodic monitoring would be required. Additional resource protection policies to avoid indirect damage from contaminants originating on MYF are listed in the Management Plan and are repeated below:

- All waste material must be disposed of in approved receptacles and removed from MYF
- Paved surfaces will be cleaned by sweeper vacuum. Paved surfaces will not be cleaned by "hosing down."
- Fuel spills will be cleaned up using "dry sweep" absorbent materials. The dry sweep material will be removed from the ground and disposed of properly and in accordance with hazardous materials regulations
- Herbicides will be used on paved areas only and in accordance with instructions.

Potential loss of vernal pools through airport property development are discussed in the Management Plan. No future development has been proposed within the mitigation site and no development within the mitigation area would be considered compatible with the restoration objectives of this area. Once created, the mitigation site with its vernal pools complexes will be afforded the protection that is inherent of vernal pools and jurisdictional waters of the U.S. and conserved lands within the City's MHPA.

10.0 References Cited

- Allen, M. F. 1988. Below Ground Structure: A Key to Reconstructing a Productive Arid Ecosystem. In *The Reconstruction of Disturbed Lands: An Ecological Approach*, edited by E. B. Allen. Westview Press, Boulder, CO.
- Bauder E.T. and S. McMillan. 1998. Current distribution and historical extent of vernal pools in Southern California and Northern Baja California, Mexico. In E.W. Witham, E. Bauder, D. Belk, W. Ferran, and R. Ornduff (eds.). *Ecology, Conservation, and Management of Vernal Pool Ecosystems: Proceedings from a 1996 Conference*. California Native Plant Society, Sacramento, California.
- California Native Plant Society (CNPS). 2012. Inventory of Rare and Endangered Plants (online edition, v8-01a). California Native Plant Society. Sacramento, CA. Accessed on Thursday, November 01, 2012.
- California, State of. 2009. State and Federally Listed Endangered, Threatened, and Rare Plants of California. Natural Diversity Database. Department of Fish and Game. October.
- California, State of. 2009b. State and Federally Listed Endangered and Threatened Animals of California. Natural Diversity Database. Department of Fish and Game. October.
- City of San Diego. 1997. City of San Diego Multiple Species Conservation Program; City of San Diego MSCP Subarea Plan. City of San Diego Community and Economic Development Department. San Diego, California.
- _____. 2012a. San Diego Municipal Code: Land Development Code, Biology Guidelines [Internet]. Adopted 1999, Amended 2000, 2001, and 2012. 108 pp. (Includes Significance Determination Thresholds under CEQA as Appendix I and Guidelines for Conducting Biological Surveys as Appendix II). Available from: <http://www.sandiego.gov/development-services/pdf/industry/landdevmanual/ldmbio.pdf>
- _____. 2012b. San Diego Municipal Code. Chapter 14 (General Regulations), Article 3 (Supplemental Development Regulations), Division 1 (Environmentally Sensitive Lands Regulations) [Internet]. Available from: <http://docs.sandiego.gov/municode/MuniCodeChapter14/Ch14Art03Division01.pdf>.
- Eriksen, C., and D. Belk. 1999. *Fairy Shrimps of California's Puddles, Pools, and Playas*. Mad River Press, Eureka, CA.
- Holland, R. F. 1986. Preliminary Descriptions of the Terrestrial Natural Communities of California. Nongame-Heritage Program, California Department of Fish and Game. October.
- Merkel & Associates, Inc. 2011. As-Built/Post-Construction Report for the Montgomery Field Localizer Antenna Protection Project
- Merkel & Associates, Inc. 1998. First Annual Vernal Pool Monitoring Report North County Transit District Carlsbad Poinsettia Station.
- P&D Environmental 1998. Resource Management Plan Montgomery Field Airport. Prepared for the City of San Diego Montgomery Field Airport.
- Patterson, C. 1995. Field notes from May 19, 1995. Eastgate Mall (EPA Study Area) I6 Pool Series.

- Patterson, C. and J. Netting. 1994a. Monitoring Report for Lopez Ridge Vernal Pool Restoration. RECON Number 2598N. City of San Diego Environmental Services Division. September 22, 1994.
- Patterson, C. and J. Netting. 1994b. Monitoring Report for the NAS Miramar Vernal Pool Restoration. City of San Diego Environmental Services Division.
- RECON. 2009. Draft Biological Technical Report for the MYF Localizer Project at Montgomery Field, San Diego, California. December 3rd, 2009.
- RECON. 2008a. Draft Environmental Constraints Report for West and Northwest Areas of Montgomery Field Airport, San Diego, California. November 4th, 2008
- RECON. 2008b. Jurisdictional Delineation Report for Montgomery Field, San Diego, California. November 4th, 2008.
- RECON. 2001. Vernal Pool Restoration Plan for the Wire Mountain Housing Area Marine Corps Base Camp Pendleton San Diego, California. August 24.
- RECON. 1997. Biological technical report for Dennerly Ranch. April 10.
- San Diego, City of. 2002. Guidelines for Conducting Biology Surveys. Attachment III, General Outline for Revegetation/Restoration Plans. July.
- San Diego, City of. 1997. City of San Diego Multiple Species Conservation Plan (MSCP) Subarea Plan. March.
- Scheidlinger, C., C. Patterson, and P. Zedler. 1985. Recovery of Vernal Pools and Their Associated Plant Communities Following Disturbance: Miramar, San Diego County, CA. U.S. Environmental Protection Agency.
- U.S. Department of Agriculture. 1973. *Soil Survey, San Diego Area, California*. Edited by R. H. Bowman. Soil Conservation Service and Forest Service. December.
- U.S. Fish and Wildlife Service (USFWS). 1997. Endangered and Threatened Wildlife and Plants; Determination of Endangered Status for the San Diego Fairy Shrimp. *Federal Register* 62(22):4925-4939, February 3.
- U.S. Geological Survey (USGS). 1975. La Mesa and National City 7.5-minute topographic maps. Original Print 1967. Photorevised 1975.
- Zedler, P.H. 1987. The ecology of southern California Vernal Pools: A Community Profile . U.S. Fish & Wildlife Service. Rept. 85(7.11). 136 pp.