OTAY CROSSINGS COMMERCE PARK

APPENDIX F

BIOLOGICAL RESOURCES REPORTS

to the

DRAFT SUPPLEMENTAL
ENVIRONMENTAL IMPACT REPORT

EIR 93-19-006Q, TM 5405RPL[7]
SCH No. 2006041039

Lead Agency:

County of San Diego
Department of Planning and Land Use
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AUGUST 2011

OTAY CROSSINGS COMMERCE PARK

OFF-SITE VERNAL POOL REVEGETATION PLAN
SPA 04-006, TM5405RPL4

May 11, 2010

Project Proponent:

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County-approved
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Otay Crossings Commerce Park
Off-site Vernal Pool Revegetation Plan

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LIST OF ABBREVIATIONS

AMSL	above mean sea level
CDFG	California Department of Fish and Game
Corps	U.S. Army Corps of Engineers
County	County of San Diego
EOMSP	East Otay Mesa Specific Plan
HELIX	HELIX Environmental Planning, Inc.
MSCP	Multiple Species Conservation Program
QCB	Quino checkerspot butterfly
SR	State Route
TM	Tentative Map
USFWS	U.S. Fish and Wildlife Service
UTM	Universal Transverse Mercator

1.0 INTRODUCTION

This report provides the compensatory mitigation plan for direct impacts to road pools with fairy shrimp resulting from implementation of the Otay Crossings Commerce Park project (proposed project). The mitigation measures identified herein are based on those contained in the Otay Crossings Commerce Park Biological Technical Report (HELIX Environmental Planning, Inc. [HELIX] 2010a). The proposed mitigation is intended to meet the requirements of the Biological Opinion to be issued by the U.S. Fish and Wildlife Service (USFWS) as well as the County of San Diego's (County's) Resource Protection Ordinance and Biological Mitigation Ordinance. Fairy shrimp basin restoration (vernal pool creation) will occur off site within a biological open space area within the Lonestar Ridge project site. This restoration effort will be conducted in conjunction with the Quino checkerspot butterfly (*Euphydryas editha quino*; QCB) and burrowing owl (*Athene cunicularia*) mitigation plan for the project (HELIX 2010b).

2.0 PROJECT DESCRIPTION

2.1 RESPONSIBLE PARTIES

Kearny PCCP Otay 311, LLC will be responsible for carrying out the required mitigation and monitoring for the vernal pool creation for the Otay Crossings Commerce Park project. Contact information is provided below.

Kearny PCCP Otay 311, LLC
655 W. Broadway, Ste. 1600
San Diego, CA 92101
(619) 702-8130
Contact: John Bragg

2.2 PROJECT LOCATION

The 311.5-acre project site is located in the extreme southeastern portion of Otay Mesa within San Diego County (Figure 1). The property lies to the southeast of the intersection of Otay Mesa and Alta roads just north of the U.S./Mexico border. It occupies portions of Sections 31 and 32 within Township 18 South, Range 1 East of the U.S. Geological Survey 7.5-minute Otay Mesa quadrangle (Figure 2). The site is within the East Otay Mesa Specific Plan (EOMSP) area and contains areas designated in the County's Multiple Species Conservation Program (MSCP; County 1997) as Major Amendment Areas, Minor Amendment Areas, and Minor Amendment Areas Subject to Special Consideration.

2.3 PROJECT SUMMARY

The proposed Otay Crossings Commerce Park project site is a Tentative Map (TM) and Preliminary Grading Plan (Tract 5405) for land designated for Mixed Industrial, Rural Residential, and State Route ([SR]; i.e., SR-11) use in Subarea 2 of the EOMSP. The TM would subdivide the 311.5-acre project site into 56 industrial lots ranging in size from 0.9 net acres to 95.4 net acres. The future

Right of Way for SR-11 and the new Port Of Entry (assumes the selected western alternative) has been tentatively mapped on 2 of the 56 proposed lots, covering approximately 120.0 acres of the site. In addition to proposed on-site development, off-site road improvements will be required along portions of Otay Mesa Road, Alta Road, and Airway Road, and off-site sewer facilities will be required along Alta Road, Siempre Viva Road, and Enrico Fermi Drive. Approximately 47.4 acres of open space will be preserved along the southern and northeastern portions of the site.

The irregularly shaped project site consists of low rolling hills and mesas and includes several narrow drainages that convey flows to the south. Elevations on site range from approximately 480 feet above mean sea level (AMSL) at points along the southern boundary to approximately 700 feet AMSL in the site's northeastern corner. Soils in the northern/northwestern portion of the site are characterized by Diablo clay, while slopes in the southern/southwestern portion are characterized by Huerhuero loam (Bowman 1973). Several dirt roads cross the site and are regularly traveled by the U.S. Border Patrol.

Surrounding land uses include an auto auction lot on the northwestern boundary, industrial public uses to the west, and a mix of industrial, commercial, and residential uses across the U.S./Mexico border. The parcel to the north is currently being graded for development. Undeveloped lands extend to the east of the site into the foothills of the San Ysidro Mountains.

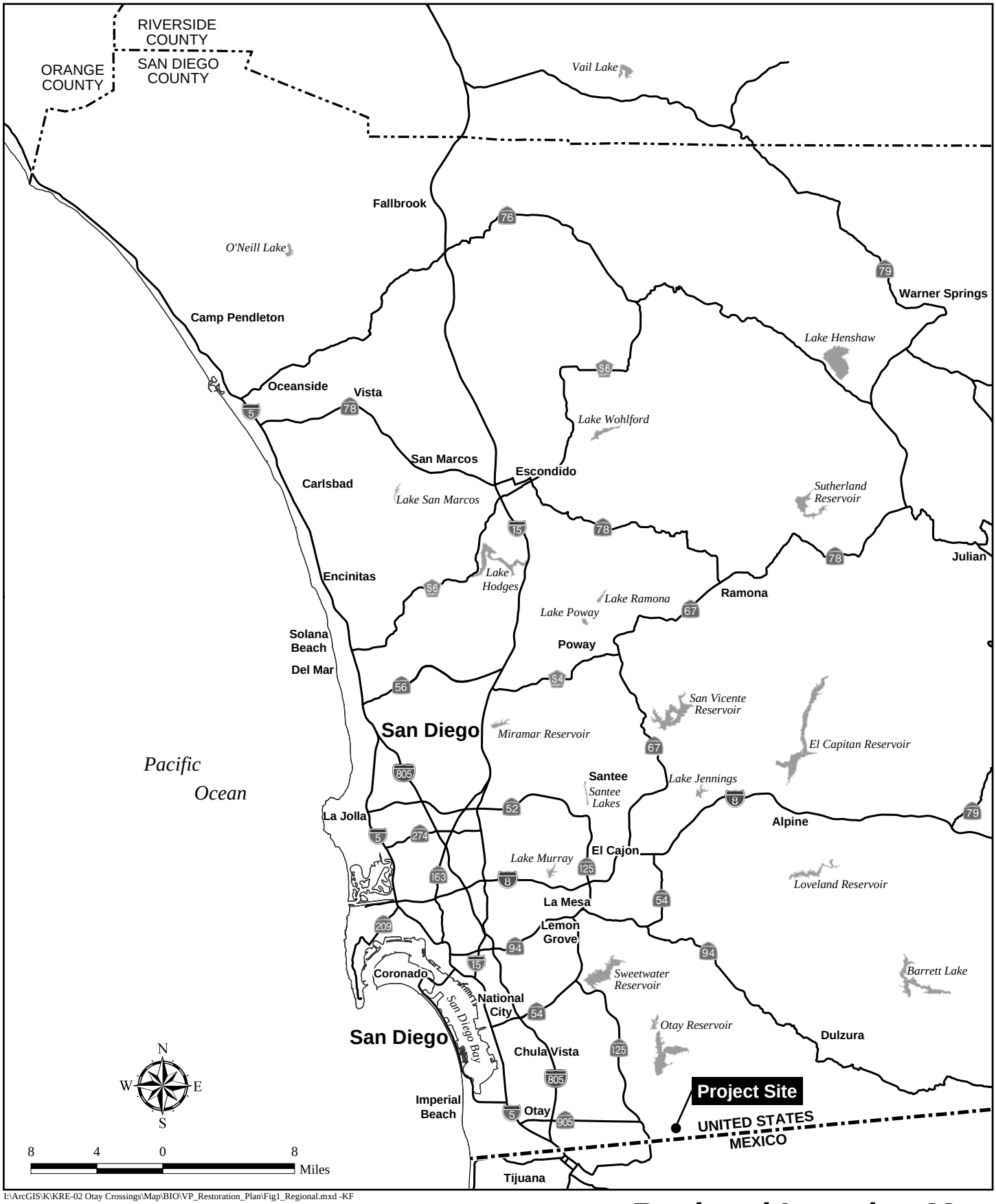
2.3.1 Vegetation Communities

Nine (9) vegetation communities found on the project site (Table 1).

Table 1
EXISTING VEGETATION COMMUNITIES

VEGETATION COMMUNITY*	ACREAGE†	
	On-site	Off-site‡
WETLANDS		
Tamarisk scrub (63810)	0.97	0.00
Disturbed wetland (11300)	0.03	0.00
TIER I		
Native grassland (42100)	0.0	0.1
Tier II		
Diegan coastal sage scrub (including disturbed; 32500)	8.7	0.1
TIER III		
Non-native grassland (42200)	278.5	19.0
TIER IV		
Eucalyptus woodland (11100)	1.0	0.0
Agriculture (18000)	<0.1	0.7
Disturbed habitat (11300)	22.2	5.0
Developed (12000)	<0.1	5.7
TOTAL	**311.5**	**30.6**

*Vegetation codes are from Holland (1986) and Oberbauer (2008)
†All wetland areas are presented in acre(s) rounded to the nearest 0.01; upland areas are rounded to the nearest 0.1
‡Off-site acreages under Sewer Option A; Sewer Options B-1 and B-2 would each include an additional 4.4 acres of impacts.



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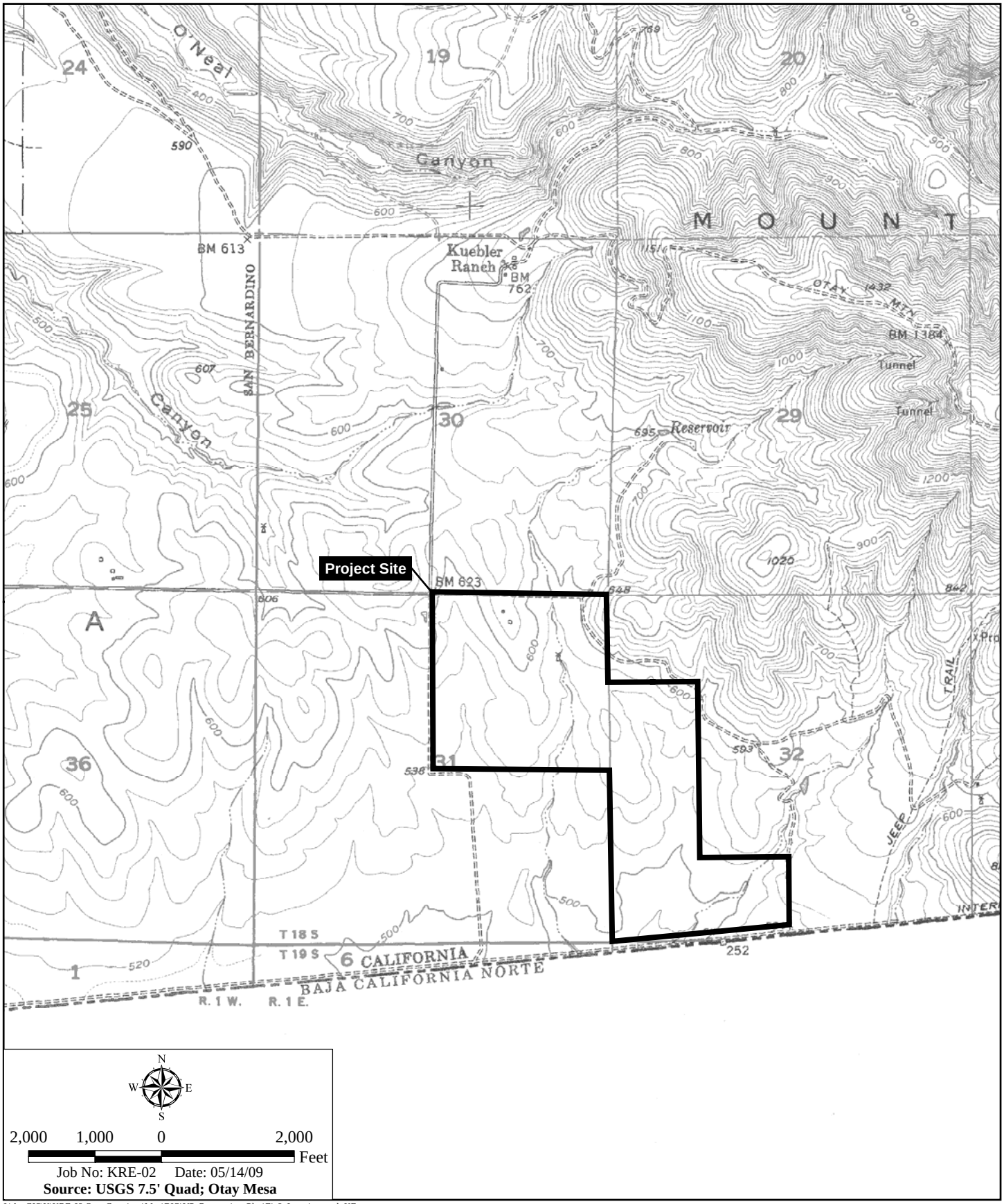
Regional Location Map

VERNAL POOL RESTORATION PLAN FOR OTAY CROSSINGS COMMERCE PARK

HELIX

Figure 1



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Project Location Map

VERNAL POOL RESTORATION PLAN FOR OTAY CROSSINGS COMMERCE PARK

HELIX

Figure 2

A complete description of the on site vegetation communities can be found the Biological Resources Report for the Otay Crossing Commerce Park project (HELIX 2010a). A total of 98 plant species were observed on the project site during various biological surveys (Appendix A).

2.3.2 Wildlife

A total of 55 animal species including 18 invertebrates, 1 amphibian, 4 reptiles, 29 birds, and 3 mammals were observed on the project site during various biological surveys (Appendix B).

2.3.3 Sensitive Species

Seven (7) sensitive plant species were observed on the project site during rare plant surveys: Otay tarplant (*Deinandra conjugens*), California adolphia (*Adolphia californica*), San Diego barrel cactus (*Ferocactus viridescens*), San Diego marsh-elder (*Iva hayesiana*), variegated dudleya (*Dudleya variegata*), San Diego County viguiera (*Viguiera laciniata*), and small-flowered morning glory (*Convolvulus simulans*).

Eleven (11) sensitive animal species were observed/detected on site during various field surveys: San Diego fairy shrimp (*Branchinecta sandiegonensis*), Riverside fairy shrimp (*Streptocephalus woottoni*), QCB, western spadefoot (*Spea hammondii*), coastal western whiptail (*Cnemidophorus tigris multiscutatus*), burrowing owl, California horned lark (*Eremophila alpestris actia*), loggerhead shrike (*Lanius ludovicianus*), northern harrier (*Circus cyaneus*), grasshopper sparrow (*Ammodramus savannarum*), and white-tailed kite (*Elanus leucurus*).

2.3.4 Sensitive Resources Affected

On- and off-site project development would cause direct impacts to approximately 293.6 acres of upland vegetation communities, comprising approximately 0.1 acre of native grassland, 2.0 acres of Diegan coastal sage scrub (including 0.3 acre of disturbed Diegan coastal sage scrub), 263.3 acres of non-native grassland, 1.0 acre of eucalyptus woodland, 0.7 acre of agriculture, 20.8 acres of disturbed habitat, and 5.7 acres of developed land.

Impacts to U.S. Army Corps of Engineers (Corps) jurisdictional areas would total 0.20 acre, including 0.19 acre of non-wetland Waters of the U.S. on site and 0.01 acre of non-wetland Waters of the U.S. off site. Impacts to California Department of Fish and Game (CDFG) jurisdictional areas would total 0.97 acre, including on-site impacts to 0.73 acre of tamarisk scrub and 0.23 acre of streambed, and off-site impacts to 0.01 acre of streambed.

All Otay tarplant, variegated dudleya, and California adolphia in the project site are outside the limits of development and would not be directly impacted; however, 72 of the 193 (37 percent) of San Diego barrel cacti and all 138 of San Diego marsh-elder, both of which are County Group B species, would be impacted. Four (4) of the 9 burrowing owl locations would be directly or indirectly impacted. Locations of 2 of the 3 QCB observed on site during 2001 focused surveys also occur within the impact footprint. Habitat occupied by Riverside fairy

shrimp, San Diego fairy shrimp, western spadefoot, coastal western whiptail, California horned lark, loggerhead shrike, grasshopper sparrow, and northern harrier would also be impacted.

2.3.5 Types, Functions, and Values of Habitat to be Restored

Vernal pool creation required for project impacts to road pools supporting San Diego and Riverside fairy shrimp habitat are addressed in this revegetation plan. Other direct project impacts requiring mitigation are addressed through habitat-based mitigation discussed in the biological technical report (HELIX 2010a).

The road pool is a basin that provides habitat for fairy shrimp and western spadefoot but is otherwise of low quality. The road pool lacks any vernal pool plant indicators. The restored vernal pools will provide habitat for San Diego and Riverside fairy shrimp and western spadefoot, as well as other invertebrate species typically found within vernal pools on Otay Mesa. Plant species limited to vernal pool habitats are also expected to occur within the created pools.

2.4 GOALS OF COMPENSATORY MITIGATION

The goal of this restoration plan is to replace functions and services associated with the road pools impacted as a result of implementation of the proposed project and to provide suitable habitat for the San Diego and Riverside fairy shrimp.

2.4.1 Responsibilities

2.4.1.1 Project Proponent

Kearny PCCP Otay 311, LLC will be responsible for financing the installation, maintenance, and monitoring of this mitigation effort.

2.4.1.2 County of San Diego/U.S. Fish and Wildlife Service

As part of the monitoring program, annual reports prepared by the restoration specialist will be submitted to the County and USFWS for review. It is the County's and USFWS' prerogative to review these reports for completeness and to participate in annual site inspections, as well as determining the success of the mitigation effort.

2.4.1.3 Compensatory Mitigation Project Designer

A licensed landscape architect will prepare necessary construction documents, including grading and planting plans, using this conceptual plan as a basis for the construction documents. If necessary, a registered civil engineer will prepare any requisite grading plans.

2.4.1.4 Installation Contractor

The installation contractor will have vernal pool restoration experience, be under the direction of the restoration specialist, and be responsible for completion of grading, pre-planting weed control, seeding, and maintenance of the mitigation area.

2.4.1.5 Restoration Specialist

Overall supervision of the installation, maintenance, and monitoring of the mitigation effort will be the responsibility of a habitat restoration specialist with vernal pool restoration experience. The habitat restoration specialist will educate all participants with regard to mitigation goals and requirements, and directly oversee grading, excavation, and placement of salvaged topsoil for vernal pool restoration. In addition, the restoration specialist will educate the contractor(s) on the installation of vernal pool plant species. If necessary, the habitat restoration specialist will provide the permittee and contractor with a brief report, including a written list of items in need of attention, following each monitoring visit. The habitat restoration specialist will notify the contractor and responsible party if any requested remediation is not addressed.

The habitat restoration specialist will be a fairy shrimp permitted biologist who will directly supervise all vernal pool restoration and maintenance. HELIX currently has a number of biologists permitted to conduct work on San Diego and Riverside fairy shrimp.

2.4.1.6 Revegetation Maintenance Contractor

After the installation contract is completed, the project proponent(s) will hire a maintenance contractor for the duration of the 5-year monitoring period. The maintenance contractor and the installation contractor may be the same entity. The project proponent may change contractors at its discretion. The maintenance contractor will be educated as to the maintenance of native plant habitat and the difference between native plants and weeds. The maintenance contractor will service the entire restoration area at least once per month. Service will include but not be limited to weed control, trash removal, fence repair, dead plant replacement, and re-seeding. All activities conducted will be seasonally appropriate and approved by the restoration specialist. The maintenance contractor will meet the restoration specialist at the site when requested and will perform all checklist items in a timely manner, as directed by the project proponent.

2.4.2 Types and Areas of Habitat to be Established

Mitigation for impacts to 0.002 acre of basin supporting fairy shrimp will consist of 0.006 acre of vernal pool creation.

2.4.3 Functions and Values

Vernal pool creation will provide habitat for listed fairy shrimp species, as well as other sensitive species such as western spadefoot. Services include supporting biological diversity by maintaining populations of rare species. Because vegetated vernal pools are proposed to be created rather than just unvegetated road pools as are being impacted by the project, there will be a net increase in overall functions and values for the created vernal pools.

2.4.4 Time Lapse

Vernal pool creation at Lonestar Ridge will occur concurrently with site grading of the project.

2.4.5 Cost

Installation and materials for the restoration, including grading and maintenance as well as 5 years of biological monitoring and reports, are anticipated to cost approximately $75,000.

2.5 DESCRIPTION OF THE PROPOSED COMPENSATORY MITIGATION SITE

2.5.1 Site Selection

The site chosen for vernal pool creation is within an area of the 62-acre Lonestar Ridge Biological Open Space that supports other vernal pools and will be protected from vehicular traffic by placement of fencing. Historical aerial photos indicate that vernal pools formerly existed in this receptor site.

2.5.2 Location and Size of Compensatory Mitigation Site

The 62-acre Lonestar Ridge Biological Open Space area is located east of State Route 125 and north of Lone Star Road. The Lonestar Ridge restoration site will occur within open space at approximately 32.580485 latitude, -116.959886 longitude, and Universal Transverse Mercator (UTM) 36 04 781 North/5 03 764 East (Figure 3). The mitigation will occur specifically in the southwest portion of the larger 62-acre parcel (Figure 4).

2.5.3 Functions and Values

The areas proposed for vernal pool creation are upland areas supporting non-native grassland. The biological functions and services of these areas are primarily associated with their use by wildlife. Percent cover by non-native species was visually estimated at over 90 percent during previous site visits. No wetland functions and services are associated with the area proposed for vernal pool creation.

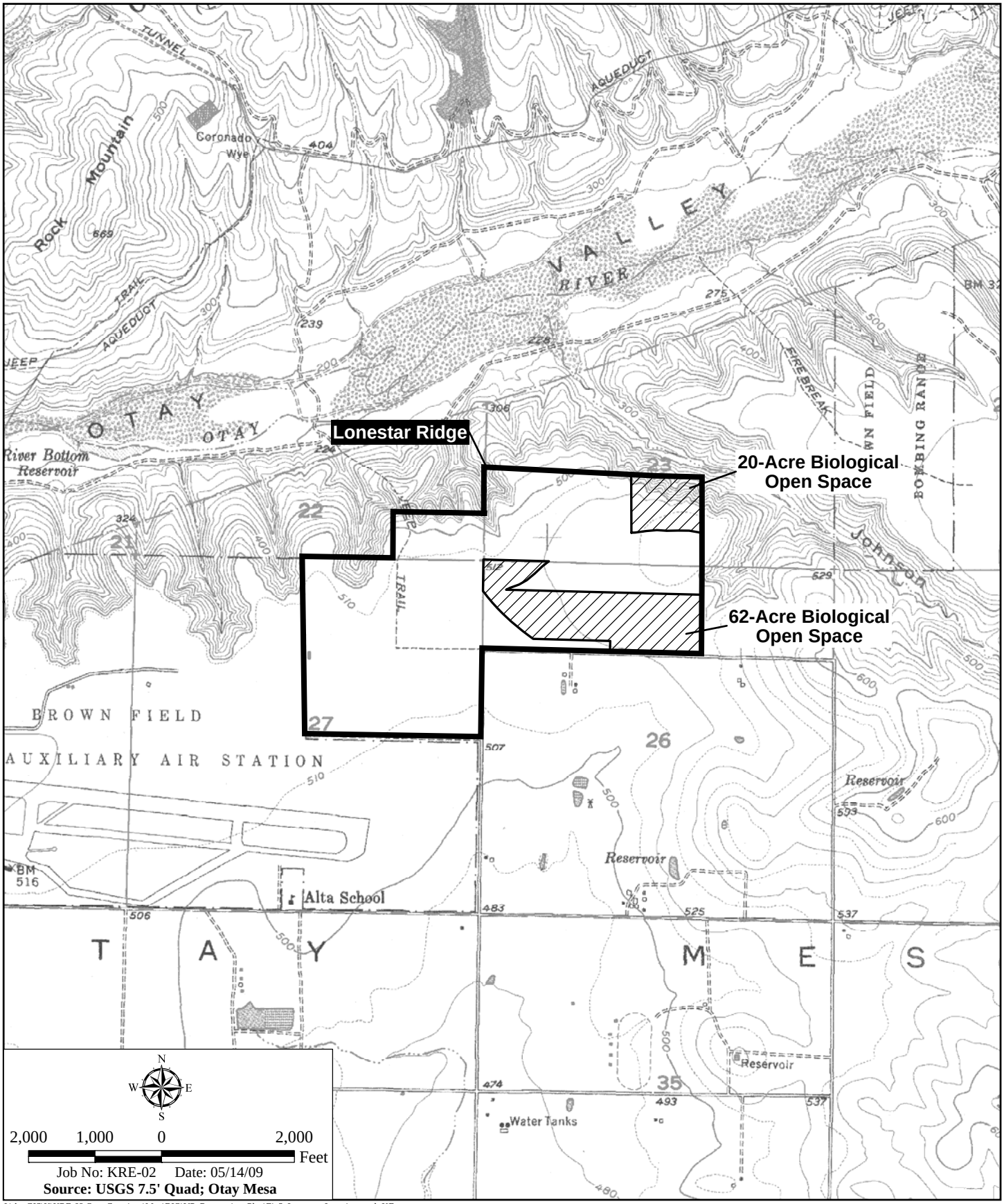
2.5.4 Present and Proposed Uses

The proposed vernal pool creation area and adjacent lands are currently vacant. The creation area will be used as mitigation for impacts to sensitive fairy shrimp. Lands adjacent to the creation area and the actual creation area will be part of the Lonestar Ridge Biological Open Space.

2.6 IMPLEMENTATION PLAN

The restoration specialist will monitor habitat restoration installation activities including grading and seeding. Installation monitoring will include attendance at one pre-construction meeting, full time monitoring during grading activities, and daily monitoring of the site during the remainder of the installation period. Specifically, the restoration specialist will:

- Document pre-construction site status by designating permanent photo locations;
- Ensure that installation personnel understand the project requirements and limitations;
- Inspect perimeter fencing (orange construction fencing) of the restoration site prior to the start of grading;



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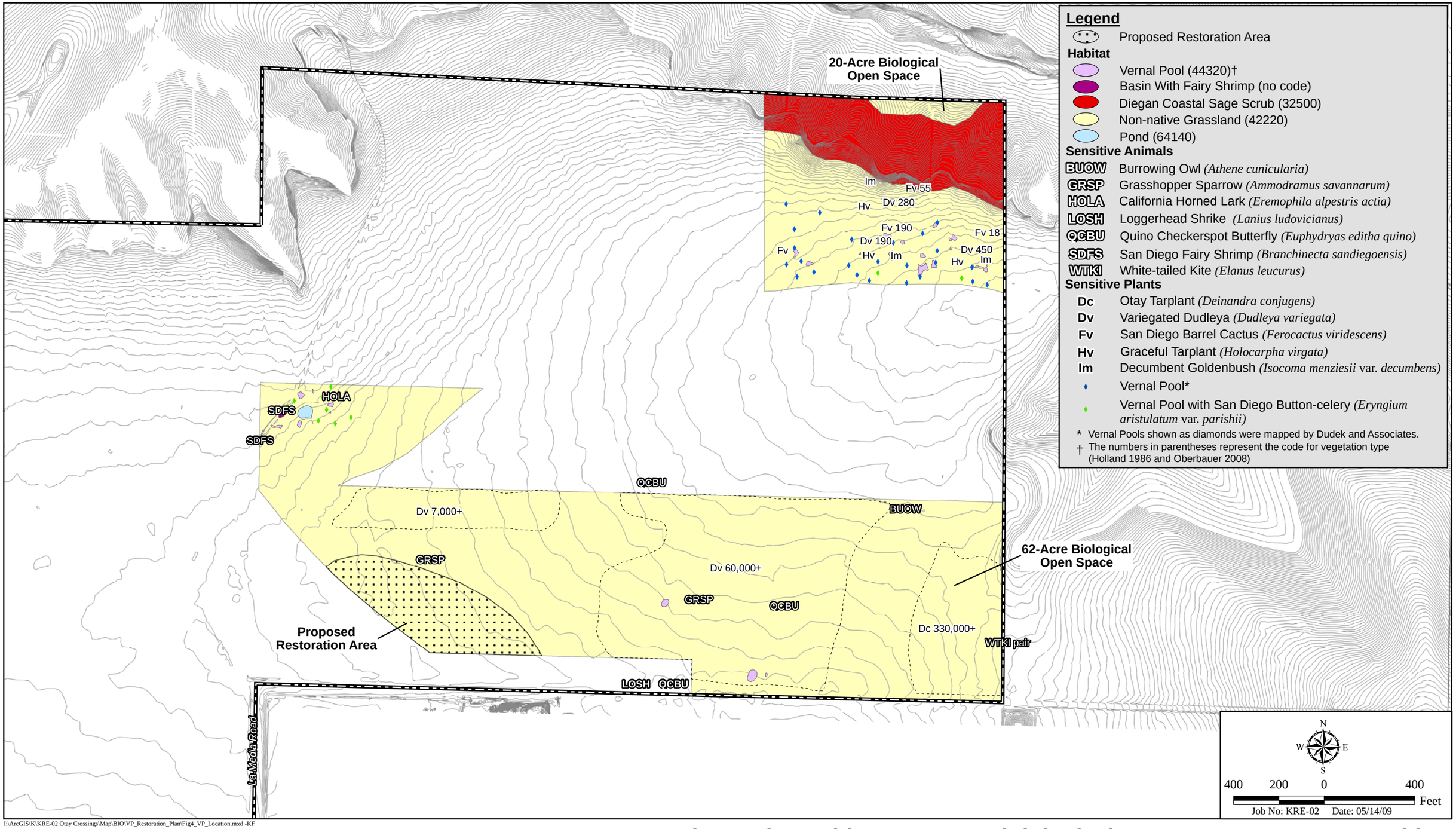
Lonestar Ridge Project Location Map

VERNAL POOL RESTORATION PLAN FOR OTAY CROSSINGS COMMERCE PARK

HELIX

Figure 3



Legend

Proposed Restoration Area

Habitat

- Vernal Pool (44320)†
- Basin With Fairy Shrimp (no code)
- Diegan Coastal Sage Scrub (32500)
- Non-native Grassland (42220)
- Pond (64140)

Sensitive Animals

- BUOW Burrowing Owl *(Athene cunicularia)*
- GRSP Grasshopper Sparrow *(Ammodramus savannarum)*
- HOLA California Horned Lark *(Eremophila alpestris actia)*
- LOSH Loggerhead Shrike *(Lanius ludovicianus)*
- QCBU Quino Checkerspot Butterfly *(Euphydryas editha quino)*
- SDFS San Diego Fairy Shrimp *(Branchinecta sandiegoensis)*
- WTKI White-tailed Kite *(Elanus leucurus)*

Sensitive Plants

- **Dc** Otay Tarplant *(Deinandra conjugens)*
- **Dv** Variegated Dudleya *(Dudleya variegata)*
- **Fv** San Diego Barrel Cactus *(Ferocactus viridescens)*
- **Hv** Graceful Tarplant *(Holocarpha virgata)*
- **Im** Decumbent Goldenbush *(Isocoma menziesii* var. *decumbens)*
- Vernal Pool*
- Vernal Pool with San Diego Button-celery *(Eryngium aristulatum* var. *parishii)*

* Vernal Pools shown as diamonds were mapped by Dudek and Associates.

† The numbers in parentheses represent the code for vegetation type (Holland 1986 and Oberbauer 2008)

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Vegetation and Sensitive Resources/Biological Open Space at Lonestar Ridge

VERNAL POOL RESTORATION PLAN FOR OTAY CROSSINGS COMMERCE PARK

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Figure 4

- Monitor all grading activities;
- Ensure that grading is appropriate to support the target habitat types;
- Inspect plant and seed material prior to installation;
- Monitor the manner in which the plant and seed material is installed; and
- Prepare and submittal a letter to the USFWS and County stating that the installation is complete.

The 5-year establishment period will begin after USFWS and County staff have field verified that restoration has been installed as specified in the construction documents, or 4 weeks following submittal of the letter stating the installation is complete, which ever occurs first.

2.6.1 Rationale for Expecting Implementation Success

The area selected for vernal pool creation will be located in a fenced biological open space area that will preclude vehicular access. This open space preserve will be maintained in perpetuity as further discussed in the Resource Management Plan for the Otay Crossings Commerce Park Biological Open Space at Lonestar Ridge (HELIX 2010c).

The mitigation site consists of Stockpen soils, which are known to support vernal pools in Otay Mesa. Vernal pools almost certainly covered the entire 62-acre mitigation parcel prior to use of the site for agricultural purposes. A watershed analysis of several mound and basin vernal pool complex maps from Kearny Mesa and Otay Mesa found watershed to pool surface area ratios as low as 4:1, and commonly 6:1 or 7:1 (RECON 1997). Studies have shown that direct precipitation plays a more important role in pool filling than watershed contributions in more porous soils (Hanes and Stromberg 1998) while subsurface flow may have an effect on the duration of ponding.

It is anticipated that the planned watershed to pool ratio will be sufficient to support the restored vernal pools. The planned watershed to pool ratio of the creation area is 7:1, which is similar to or larger than other vernal pool complexes in the Otay Mesa area. Additionally, the project team is comprised of a number of individuals who have been involved in the successful implementation of several vernal pool and fairy shrimp restoration efforts in San Diego and Riverside counties.

2.6.2 Financial Assurances

A revegetation agreement shall be signed and notarized by Kearny PCCP Otay 311, LLC and the owners of the Lonestar Ridge Open Space following approval of this revegetation plan and accompanied by the required security as agreed upon by the County.

2.6.3 Installation Schedule

Implementation of the vernal pool mitigation program is expected to begin in fall 2010, provided that weather and soil conditions are dry enough to conduct the restoration without causing irreparable damage to the surrounding habitat. No activities will be conducted within the basins supporting fairy shrimp on the project site unless approved by the USFWS and County. The following conditions must be met to obtain this approval:

1. Grading will occur only when the soil is dry to the touch both at the surface and 1 inch below, and a visual check for color differences (i.e., darker soil indicating moisture) in the soil between the surface and 1 inch below indicates that the soil is dry.

2. Grading will occur outside of the breeding season (February 15-August 31) to avoid impacts to breed bird species.

3. After a rain of greater than 0.2 inch, grading will occur only after the soil surface has dried sufficiently as described above and no sooner than 2 days (48 hours) after the rain event ends.

4. Grading will commence only when no rain is forecast during the anticipated grading period.

5. To prevent erosion and siltation from stormwater runoff due to unexpected rains, Best Management Practices (e.g., silt fences and fiber rolls) will be implemented as needed during grading.

6. If rain occurs during grading, work will stop and only resume after soils are dry, as described above.

2.6.4 Monitoring Schedule

Initial activities will include delineating all restoration areas, impacted pool inoculum salvage (discussed in Section 2.6.6), weed and trash removal, and vernal pool grading. Grading of the created vernal pools will start once the area has been cleared of all trash and debris. Seeding of upland/inter-pool areas will begin when vernal pool grading is complete. The entire creation effort is anticipated to be complete within 4 weeks of starting.

Monitoring of the restoration effort will begin immediately following installation, as stipulated in Section 2.6. The monitoring program will continue for a 5-year period, according to the schedule presented in Table 2. Monitoring memos noting any issues with plant establishment, sediment control, etc., will be provided as necessary to the installation/maintenance contractor(s) and project proponent(s). Five (5) annual reports will be prepared and distributed by September 30th. The results of the annual reports will be used to document the success of the restoration effort and to determine what, if any, remedial actions are necessary.

Table 2
MAINTENANCE MONITORING SCHEDULE

PHASE	SCHEDULE
Installation	
Site preparation and installation	Daily
Post Installation	
Year 1	Monthly
Year 2	
December to May	Monthly
June to November	Twice: July and September
Years 3 to 5	Quarterly: March, June, September, and December

2.6.5 Site Preparation

The created vernal pools (Figure 4) will be formed to replicate hydrologic conditions of existing vernal pool habitat in Otay Mesa. A grading plan will be prepared using 0.5 foot contours prior to initiating work. The restoration specialist will mark all areas to be graded. Existing sensitive habitats and plants also will be marked in a way to insure their persistence (e.g., stakes and flagging). An on-site meeting will be held with the restoration specialist and all installation personnel to identify sensitive areas and devise a strategy for avoidance prior to initiation of restoration activities. A staging area will be established outside of the vernal pool restoration area and other preserved habitat. Grading shall be implemented using small rubber-tired loaders and tracked dozers with ripping tines and slope boards. All vehicles and construction equipment will be restricted to the staging areas when not required for restoration activities.

Prior to and during construction, a temporary orange construction fence will identify equipment access routes and work areas for the vernal pool creation area.

2.6.6 Planting Plan

Restoration of vernal pool habitat requires the reintroduction of plants and animals in addition to the physical construction described above. Partly because vernal pools recur reliably in the same location year after year, many vernal pool species are adapted for a strategy of non-dispersal (Zedler 1990). As a result, the restoration of vernal pool habitat can be greatly accelerated by the active transport of propagules from donor sites into the restored pools (Scheidlinger et al. 1985). Prior to construction, road pool topsoil from the Otay Crossings project impact area will be collected and stored for use in the vernal pool restoration efforts on Lonestar Ridge. Because of the low quality of the on-site pools, other inoculum will be required to supplement the salvaged soils. Potential sources of inoculum include other vernal pool restoration projects being conduced by HELIX in Otay Mesa. The collected inoculum from each pool will be labeled and kept separate from inoculum collected from other pools. Hand tools (i.e., shovels and trowels) will be used to remove the first 2 inches of soil from the existing pools. Each of the restored pools will receive a share of the total collected pool material proportionate to its surface area. The collected soils will be spread out and raked into the bottoms of the restored pools. Any other salvaged material will be distributed evenly between the restored pools.

Floral and faunal species composition within the restored pools is expected to be similar to existing pools in the Otay Mesa area. Table 3 presents a list of plant and animal species anticipated to occur in the restored pools. The presence and abundance of these species is dependent on suitable seed/inoculum. Of the target species listed in Table 3, only San Diego and Riverside fairy shrimp are required to occupy the pools in order to meet success criteria; there are no success criteria associated with plant species or other animal species.

Table 3 TARGET VERNAL POOL SPECIES*	
SCIENTIFIC NAME	**COMMON SCIENTIFIC NAME**
Vernal Pool Indicators†	
Flora List	
Callitriche marginata	long-stalk water-starwort
Crassula aquatica	water pygmy-weed
Deschampsia danthonoides	annual hairgrass
Elatine brachysperma	waterwort
Eryngium aristulatum var. *parishii*	San Diego button-celery
Isoetes orcuttii	Orcutt's quillwort
Lilaea scilloides	flowering quillwort
Marsilea vsetita	hairy clover fern
Myosurus minimus	little mousetail
Navarretia fossalis	spreading navarretia
Orcuttia californica	California orcutt's grass
Pilularia americana	American pillwort
Plagiobothrys acanthocarpus	adobe popcorn flower
Plantago elongata	prairie plantain
Pogogyne nudiuscula	Otay mesa mint
Psilocarphus brevissimus	woolly marbles
Other Wetland Species	
Eleocharis macrostachya	pale spike-sedge
Juncus bufonius	toad-rush
Fauna List	
Acanthocyclops sp.	copepods
Branchinecta sandiegonensis	San Diego fairy shrimp
Daphnia sp.	water fleas
Ostracod species	seed shrimp
Streptocephalus woottoni	Riverside fairy shrimp

*Additional inoculum is required to achieve presence of all target species. Inoculum from the impacted road pools may or may not contain these species

†Based on Corps Vernal Pool Plant Indicator List (Corps 1997)

2.6.7 Irrigation Plan

No irrigation is proposed.

2.7 ESTABLISHMENT PERIOD MAINTENANCE

2.7.1 Maintenance Activities

A 5-year maintenance program is proposed to ensure the successful establishment and persistence of the restored vernal pool habitat. The maintenance program will involve removal of trash, weed control, and any remedial measures deemed necessary for the success of the restoration program (e.g., re-seeding and re-planting). Maintenance activities will be directed by the restoration specialist.

2.7.1.1 General Maintenance

Damage to pools and other facilities occurring as a result of unusual weather or vandalism will be repaired as directed by the restoration specialist. The cost of such repairs will be paid for as extra work. The contractor will be responsible for damage caused by the contractor's inadequate maintenance as determined by the restoration specialist.

It is the maintenance contractor's responsibility to keep all planted areas free of debris and to monitor plant material condition and health, weeding, and erosion control. The maintenance contractor also will be responsible for replacing any dead or terminally diseased plants (within the wetland creation area) at the direction of the restoration specialist. Fertilizer will only be applied in extraordinary circumstances and only at the written direction of the restoration specialist. No post-installation pruning is necessary unless otherwise directed by the restoration specialist.

Pests will be tolerated unless they pose a significant threat to project success. If deemed necessary, a licensed pest control adviser will make specific pest control recommendations. All applicable federal and state laws and regulations will be closely followed. The restoration specialist will be consulted on any pest control matters.

These maintenance guidelines are tailored to native plant establishment. Maintenance personnel will be informed of the habitat restoration goals so that they understand the maintenance requirements. A professional with experience and knowledge in native habitat restoration maintenance will supervise all maintenance.

2.7.1.2 Non-native Plant Control

Particular emphasis will be placed on pro-active weed control. There will be a very low tolerance for weed species within the restoration areas. Weed eradication will be conducted as necessary to minimize competition that could prevent the establishment of native species. As weeds become evident, they should be removed by hand or controlled with the proper herbicides. The restoration specialist will oversee weed control by the maintenance contractor. Maintenance personnel will be trained to distinguish weed species from desirable native vegetation.

2.7.1.3 Invasive Plant Control

In addition to the general weed control effort described above, certain highly invasive plant species have been targeted for complete eradication within the 62-acre Biological Open Space: fennel (*Foeniculum vulgare*), pampas grass (*Cortaderia* sp.), giant reed (*Arundo donax*), artichoke thistle (*Cynara cardunculus*), and tamarisk (*Tamarix* sp.). These species are rated as either High or Moderate in the California Invasive Plant Inventory prepared by the California Invasive Plant Council (Cal-IPC 2006), which includes highly invasive pest plants that have been documented as aggressive invaders that displace natives and disrupt natural habitats. There will be no tolerance for these species within the vernal pool creation area. Additional species may be added to this list if found to be a threat to the long-term success of the restoration effort.

2.7.1.4 Other Pests

Insects, vertebrate pests, and diseases will be monitored. Generally speaking, a high threshold of tolerance will be permitted before control measures are considered. Only a licensed pest control adviser as required by law will make specific recommendations. All applicable federal and state laws and regulations will be closely followed. The restoration specialist will be consulted on any pest control matters.

2.7.1.5 Fertilization

Fertilizer will not be applied except in extraordinary circumstances and only at the written direction of the restoration specialist.

2.7.1.6 Pruning

No post-installation pruning is necessary unless otherwise directed by the restoration specialist.

2.7.1.7 Sensitive Species Issues

Maintenance activities will not include use of heavy equipment or vehicles and as such are not anticipated to have adverse effects on sensitive species. Nonetheless, all maintenance activities will be carried out under the direction of the restoration specialist, as necessary, to avoid any impacts to sensitive species.

2.7.2 Schedule

The restoration specialist will monitor the activities of the maintenance contractor during the 5-year establishment period (Table 4). Regular maintenance, trash removal, and weed control will be conducted during the first 5 years following implementation of the mitigation program or until the mitigation program is deemed successful.

Table 4 POST INSTALLATION MAINTENANCE SCHEDULE	
Years	**Frequency**
1 and 2	Monthly
3 through 5	Quarterly: March, June, September, and December

Maintenance visits will be conducted monthly during Years 1 and 2. Quarterly visits (March, June, September, and December) will be conducted during Years 3 through 5. This maintenance schedule is the minimum; more frequent inspections may be necessary if there are problems with contractor performance or habitat development.

2.8 MONITORING PLAN

2.8.1 Performance Standards for Target Dates and Success Criteria

The following standards will be used to determine the successful completion of the 5-year mitigation and monitoring program. Attainment of these standards indicates the restored habitat is progressing toward the habitat functions and services specified for this plan. Methods used to measure these success criteria are described below. The USFWS and County may terminate monitoring earlier than 5 years if success criteria are met and it is recommended by the restoration specialist in an annual report.

By Year 3 the ultimate success or failure of the site should be apparent. If success cannot reasonably be expected, any measures that will improve the probability of success should be implemented. Implementation of such measures should be done in consultation with the USFWS and County. If no such measures are available, the USFWS and County should be consulted on an alternative course of action. Similarly, if the restored areas fail to meet the Year 5 success criteria at the end of the establishment period, a specific set of remedial measures (approved by the USFWS and County) will be implemented, and the monitoring and maintenance period will be extended until all Year 5 criteria are met or as otherwise provided in this document. Only areas failing to meet the success standards will require additional work (i.e., excluding restored areas that meet the final success criteria).

Species Richness

No success criteria for species richness is required, as mitigation is for unvegetated basins (road pools) supporting fairy shrimp.

Vegetative Cover of Vernal Pool Indicator Species

No success criteria for vegetative cover is required, as mitigation is for unvegetated basins (road pools) supporting fairy shrimp.

Non-native/Invasive Plant Cover

Non-native weed species anticipated to encroach upon the vernal pools include African brass buttons (*Cotula coronopifolia*), grass poly (*Lythrum hyssopifolium*), curly dock (*Rumex crispus)*, annual beard grass (*Polypogon monspeliensis*), filaree (*Erodium* sp.), and Italian ryegrass (*Lolium multiflorum*). Of these weed species, only Italian ryegrass is considered to be a significant competitor to native vernal pool indicator species. Elimination of this species will be the main focus of the vernal pool weed control effort. Relative cover of Italian ryegrass shall not exceed 1 percent during the 5-year monitoring period. Control of weed species categorized as High or Moderate in the Cal-IPC 2006 Invasive Plant Inventory shall be conducted such that at the end of the 5-year monitoring period, the relative cover of such weed species in each restored vernal pool is zero.

Fairy Shrimp

The created vernal pools are intended to support San Diego and Riverside fairy shrimp. All of the created vernal pools will be deep enough to support Riverside fairy shrimp. Fairy shrimp sampling will be conducted each season and the number of shrimp present in each pool will be estimated. The number of gravid females also will be estimated. Fairy shrimp data also will be collected in the off-site control pools to help gauge the success of the restoration effort. In general, the restored pool population numbers should either be stable or show an increasing trend over the 5-year monitoring period to be considered successful. If the restored vernal pool shrimp populations decline in any given year and the control pool populations also decline, then it will be assumed that there are other outside, climatological effects driving the change, as opposed to specific factors at the restoration site.

2.8.2 Target Functions and Services

Upon meeting success criteria, the vernal pool creation areas will provide a minimum of 0.006 acre of suitable habitat for listed fairy shrimp species, as well as other sensitive species such as western spadefoot. Services will include supporting biological diversity by maintaining populations of rare species.

2.8.3 Target Hydrological Regime

As previously stated, vernal pools created under this mitigation program are primarily designed to emulate the conditions found in existing vernal pools on Otay Mesa. The created vernal pools will be excavated and situated to capture rainfall and runoff from the open space preserve.

During the 5-year monitoring period, water depth in the created vernal pools will be measured. Measurements will be taken every 2 weeks during each rainy season throughout the monitoring period. The depth and extent of ponding (surface area) will be recorded during each site visit in each created vernal pool. Depth measurements will be taken following the onset of winter rains and will continue until May 15 or until all vernal pools are dry. This data will be used to create graphs showing depth and duration of ponding. At the end of the 5-year monitoring period, the

monitored pools will demonstrate hydrologic patterns suitable for supporting the target fairy shrimp species. The monitoring period may have to be extended if a drought period prevents the pools from demonstrating the desired hydrologic patterns.

Success for the hydrological criteria is that in each year that there is enough rainfall to produce ponding of sufficient length (45 days) to support Riverside fairy shrimp in the control pools, similar ponding also occurs in the constructed pools.

2.8.4 Target Acreages

The target acreage of vernal pool mitigation is 0.006 acre, consisting entirely of creation.

2.8.5 Monitoring Methods

Monitoring will be carried out under the direction of the restoration specialist to assess the progress of the restoration effort and determine any appropriate remedial measures. Quantitative success criteria presented above will be used to measure mitigation success. Final and yearly success criteria are included to measure interim and ultimate habitat development. If annual goals are not being met, corrective measures will be implemented. Corrective measures for fairy shrimp may include but are not limited to importing new soil inoculum from an off-site source, and recontouring of non-functioning pools. Prior to conducting any remedial measures outside of this plan, the USFWS and County will be notified.

As conditions warrant, additional site visits beyond what are specified in Table 4 may be required during the establishment period. Water quality (i.e., pH, temperature, total dissolved solids [or turbidity], and salinity [via electroconductivity]) within at least 2 pools will be documented, including at least 1 pool constructed for San Diego fairy shrimp and 1 pool constructed for Riverside fairy shrimp. Dry season fairy shrimp sampling will be conducted in the late summer of Year 5 to determine density of viable cysts in the soils.

The purpose of the wet and dry season fairy shrimp surveys is to determine presence/absence of San Diego and Riverside fairy shrimp in the created pools, in particular viable cysts, hatched fairy shrimp, and gravid female estimates. The presence of other faunal species occupying the pools, as well as any vernal pool plant indicator species, also will be noted during the surveys. The results of the fairy shrimp surveys will be included in the annual monitoring reports.

Photo documentation points shall be established for the creation area, and photographs will be taken of each pool during the annual monitoring event. Representative photos will be provided in the annual monitoring report.

2.8.6 Annual Monitoring Reports

Each annual monitoring report will include data collected throughout the year in addition to the annual monitoring visit. To detect the overall trend of the site, the annual monitoring report will contain comparisons of the monitoring data for the years that data are collected. The USFWS

and County shall be annually invited to view the mitigation site. Any significant issue or contingency that arises within the creation area (e.g. fire or flooding) shall be reported in writing to the County within 2 weeks from the date of the incident. Accompanying the report shall be a plan for remediation, with an implementation schedule and a monitoring schedule.

2.9 COMPLETION OF COMPENSATORY MITIGATION

Kearny PCCP Otay 311, LLC shall notify the USFWS and County of completion of the mitigation effort through submittal of a final (Year 5) monitoring report. After receipt of the final monitoring report, the USFWS and County may inspect the mitigation site to determine the success of the mitigation effort. After evaluating the final report, the agencies shall determine if the mitigation effort is acceptable.

2.10 CONTINGENCY MEASURES

2.10.1 Initiating Contingency Measures

If the USFWS and County determine upon receipt of any of the annual monitoring reports that the restoration effort is not meeting success standards for the project, the USFWS and County shall notify the project proponent in writing that the restoration effort may require augmentation for successful implementation. The project proponent shall then have 30 days to respond to the notification. During this period, the project proponent may discuss alternatives to the suggestions of the USFWS and County.

2.10.2 Alternative Locations for Contingency Compensatory Mitigation

Sufficient area for contingency vernal pool creation is present within the Lonestar Ridge Biological Open Space. If the success criteria are not being met, the USFWS and County will work together with the Kearny PCCP Otay 311, LLC to reach an alternative mutually acceptable solution.

2.10.3 Funding

Kearny PCCP Otay 311, LLC shall be responsible for all costs associated with any remedial measures.

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APPENDIX A

PLANT SPECIES OBSERVED

Appendix A
PLANT SPECIES OBSERVED – OTAY CROSSINGS COMMERCE PARK

FAMILY	SCIENTIFIC NAME	COMMON NAME	HABITAT‡
DICOTS			
Aizoaceae	*Mesembryanthemum nodiflorum**	slender-leaved iceplant	DCSS-D
Amaranthaceae	*Amaranthus* sp.*	tumbleweed	NNG
Anacardiaceae	*Malosma laurina*	laurel sumac	DCSS, DCSS-D
Apiaceae	*Foeniculum vulgare**	fennel	DH, DW
Asteraceae	*Ambrosia psilostachya*	western ragweed	DW
	Artemisia californica	California sagebrush	DCSS, DCSS-D
	Baccharis pilularis	coyote brush	DCSS, DCSS-D, DH
	Baccharis sarothroides	broom baccharis	DCSS, DCSS-D
	*Centaurea melitensis**	star thistle	DH, NNG
	*Conyza canadensis**	horseweed	DH
	*Cynara cardunculus**	cardoon	NNG
	Deinandra conjugens†	Otay tarplant	NNG
	Deinandra fasciculata	fascicled tarplant	DCSS, DCSS-D, NNG
	Filago californica	California filago	NNG
	*Gazania linearis**	gazania	DCSS-D, NNG
	Gnaphalium californicum	California everlasting	DCSS, DCSS-D, NNG
	Grindelia camporum var. *bracteosum*	gum plant	NNG
	*Hedypnois cretica**	Crete hedypnois	NNG
	Helianthus annuus	western sunflower	DCSS, DCSS-D, NNG
	*Hypochaeris glabra**	smooth cat's-ear	NNG
	Isocoma menziesii var. *menziesii*	San Diego goldenbush	DCSS, DCSS-D, NNG
	Iva hayesiana†	San Diego marsh-elder	NNG
	*Lactuca serriola**	wild lettuce	DW
	Lessingia filaginifolia var. *filaginifolia*	California-aster	DCSS-D, NNG
	Osmadenia tenella	osmadenia	NNG
	*Sonchus oleraceus**	common sow thistle	DH, NNG
	Stylocline gnaphaloides	everlasting nest straw	NNG
	Viguiera laciniata†	San Diego County viguiera	DCSS, DCSS-D, NNG
	*Xanthium strumarium**	cocklebur	DW
Boraginaceae	*Cryptantha* sp.	cryptantha	DCSS, DCSS-D
	Plagiobothrys sp.	popcorn flower	DCSS-D, NNG
Brassicaceae	*Brassica nigra**	black mustard	DH, NNG
	Lepidium sp.*	peppergrass	NNG
	Lepidium latifolium	peppergrass	NNG
Cactaceae	*Ferocactus viridescens*†	San Diego barrel cactus	DCSS, DCSS-D, NNG
	Opuntia littoralis	coastal prickly pear	DCSS, DCSS-D
Capparaceae	*Isomeris arborea*	bladderpod	DCSS, DCSS-D

Appendix A (cont.)
PLANT SPECIES OBSERVED – OTAY CROSSINGS COMMERCE PARK

FAMILY	SCIENTIFIC NAME	COMMON NAME	HABITAT‡
DICOTS (cont.)			
Caryophyllaceae	*Silene gallica**	common catchfly	DCSS-D, NNG
	*Spergularia bocconii**	sand-spurry	NNG
	Spergularia sp.*	sand-spurry	NNG
Chenopodiaceae	*Atriplex semibaccata**	Australian saltbush	NNG
	Chenopodium sp.*	pigweed	DH, DW, NNG
	Salicornia bigelovii	dwarf glasswort	DW
	*Salsola tragus**	Russian thistle	DH, NNG
Convolvulaceae	*Calystegia macrostegia* ssp. *arida*	finger-leaf morning-glory	DCSS, DCSS-D
	*Convolvulus arvensis**	bindweed	NNG
	Convolvulus simulans†	small-flowered morning glory	NNG
	Crassula connata	pygmy-weed	NNG
Crassulaceae	*Dudleya variegata*†	variegated dudleya	NNG
Euphorbiaceae	*Eremocarpus setigerus*	dove weed	DH, NNG
Fabaceae	*Lotus scoparius* var. *scoparius*	coastal deerweed	DCSS, DCSS-D
	Medicago polymorpha	bur-clover	NNG
	*Medicago sativa**	alfalfa	NNG
Gentianaceae	*Centaurium venustum*	canchalagua	DCSS, DCSS-D
Geraniaceae	*Erodium cicutarium**	red-stem filaree	DH, NNG
	*Erodium moschatum**	green-stem filaree	DH, NNG
Lamiaceae	*Trichostema lanceolatum*	vinegar weed	DCSS, DCSS-D
Malvaceae	*Malva parviflora**	cheeseweed	DH, NNG
Nyctaginaceae	*Mirabilis californica*	wishbone bush	DCSS-D, NNG
Oxalidaceae	*Oxalis pes-caprae**	Bermuda-buttercup	NNG
Plantaginaceae	*Plantago erecta*	dwarf plantain	DCSS-D, NNG
Polygonaceae	*Eriogonum fasciculatum* ssp. *fasciculatum*	California buckwheat	DCSS, DCSS-D, NNG
	Linanthus dianthiflorus	ground pink	DCSS, DCSS-D
	Polygonum sp.	knotweed	DH, NNG
	*Rumex crispus**	curly dock	DW, TS
Portulacaceae	*Calandrinia ciliata*	red maids	DCSS, DCSS-D, NNG
Primulaceae	*Anagallis arvensis**	scarlet pimpernel	NNG
	Dodecatheon clevelandii ssp. *clevelandii*	shooting star	DCSS-D, NNG
Rhamnaceae	*Adolphia californica*†	California adolphia	DCSS
Rubiaceae	*Galium* sp.	bedstraw	DCSS-D
Tamaricaceae	*Tamarix* sp.*	tamarisk	TS
Verbenaceae	*Verbena* sp.	verbena	NNG

Appendix A (cont.)
PLANT SPECIES OBSERVED – OTAY CROSSINGS COMMERCE PARK

FAMILY	SCIENTIFIC NAME	COMMON NAME	HABITAT‡
MONOCOTS			
Iridaceae	*Sisyrinchium bellum*	blue-eyed grass	NNG
Juncaceae	*Juncus bufonius*	toad rush	NNG
Liliaceae	*Bloomeria crocea* var. *crocea*	golden star	DCSS-D, NNG
	Brodiaea jolonensis	mesa brodiaea	DCSS-D, NNG
	Chlorogalum pomeridianum	soap plant	DCSS
	Dichelostemma capitatum	blue dicks	DCSS, DCSS-D, NNG
	Zigadenus fremontii	star-lily	NNG
Poaceae	*Avena barbata**	slender wild oat	DCSS, DCSS-D, DH, NNG
	*Avena fatua**	wild oat	DCSS-D, DH, NNG
	*Bromus diandrus**	common ripgut grass	DCSS, DCSS-D, NNG, DH
	*Bromus hordeaceus**	soft chess	NNG
	Bromus madritensis ssp. *rubens**	foxtail chess	DCSS, DCSS-D, NNG, DH
	*Gastridium ventricosum**	nit grass	NNG
	Hordeum marinum ssp. *gussoneanum**	Mediterranean barley	DH, NNG
	Hordeum sp.	barley	NNG
	*Lamarckia aurea**	goldentop	DH
	*Lolium multiflorum**	Italian ryegrass	NNG
	Lolium sp.*	ryegrass	NNG, DH
	Nassella pulchra	purple needlegrass	NNG
	Nassella sp.	needlegrass	NNG
	Phalaris sp.*	canary grass	DW
	*Polypogon monspeliensis**	annual beard grass	DW, DH, NNG
	*Schismus barbatus**	Mediterranean grass	DH, NNG
	*Vulpia myuros**	fescue	DCSS, DCSS-D, DH, NNG
Typhaceae	*Typha* sp.	cattail	DW, TS
PTERIDOPHYTES			
Selaginellaceae	*Selaginella cinerascens*	ashy spike-moss	DCSS

*Non-native species
†Sensitive species
‡Habitat acronyms: DCSS=Diegan coastal sage scrub, DCSS-D=disturbed Diegan coastal sage scrub, DH=disturbed habitat, DW=disturbed wetland, NNG=non-native grassland, TS=tamarisk shrub

APPENDIX B

ANIMAL SPECIES OBSERVED

Appendix B
ANIMAL SPECIES OBSERVED – OTAY CROSSINGS COMMERCE PARK

SCIENTIFIC NAME	COMMON NAME
INVERTEBRATES	
Anthocharis sara	Sara orangetip
Apodemia mormo virgulti	Behr's metalmark
Branchinecta sandiegonensis†	San Diego fairy shrimp
Brephidium exilis	western pygmy blue
Coenonympha californica	common California ringlet
Erynnis funeralis	funereal duskywing
Euphydryas editha quino†	Quino checkerspot butterfly
Glaucopsyche lygdamus australis	southern blue
Junonia coenia	buckeye
Papilio eurymedon	pale swallowtail
Papilio zelicaon	Anise swallowtail
Pieris rapae	cabbage butterfly
Plebejus acmon	Acmon blue
Pontia protodice	common white
Pyrgus albescens	common checkered skipper
Streptocephalus woottoni†	Riverside fairy shrimp
Vanessa annabella	west coast lady
Vanessa cardui	painted lady
VERTEBRATES	
Amphibian	
Spea hammondii†	western spadefoot
Reptiles	
Cnemidophorus hyperythrus beldingi	orange throated whiptail
Cnemidophorus tigris multiscutatus†	coastal western whiptail
Sceloporus occidentalis	western fence lizard
Thamnophis hammondii	two-striped garter snake
Birds	
Agelaius phoenceus	red-wing blackbird
Ammodramus savannarum†	grasshopper sparrow
Athene cunicularia†	burrowing owl
Buteo jamaicensis	red-tailed hawk
Carduelis psaltria	lesser goldfinch
Carduelis tristis	American goldfinch

Appendix B (cont.)
ANIMAL SPECIES OBSERVED – OTAY CROSSINGS COMMERCE PARK

SCIENTIFIC NAME	COMMON NAME
VERTEBRATES (cont.)	
Birds (cont.)	
Carpodacus mexicanus	house finch
Charadrius vociferus	killdeer
Chordeiles acutipennis	lesser nighthawk
Circus cyaneus†	northern harrier
Corvus brachyrhynchos	American crow
Corvus corax	common raven
Elanus leucurus†	white-tailed kite
Eremophila alpestris actia†	California horned lark
Falco sparverius	American kestrel
Hirundo pyrrhonota	cliff swallow
Icterus bullockii	Bullock's oriole
Lanius ludovicianus†	loggerhead shrike
Mimus polyglottos	northern mockingbird
Passer domesiticus	house sparrow
Passerina caerulea	blue grosbeak
Pipilo crissalis	California towhee
Sayornis nigricans	black phoebe
Sturnella neglecta	western meadowlark
Sturnus vulgaris	European starling
Tyrannus verticalis	western kingbird
Tyrannus vociferans	Cassin's kingbird
Zenaida macroura	mourning dove
Zonotrichia leucophyrys	white-crowned sparrow
Mammals	
Spermophilus beecheyi	California ground squirrel
Sylvilagus audubonii	desert cottontail
Thomomys bottae	Botta's pocket gopher

†Sensitive species