Appendix 4
Biological Technical Report

SOUTH MILLIKEN DISTRIBUTION CENTER

Project No. PLN17-20013

INITIAL STUDY

General Biological Resources Assessment for the South Milliken Distribution Center Project

December 2017

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General Biological Resources Assessment for the South Milliken Distribution Center Project

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1.0 INTRODUCTION

This report describes the existing biological resources for the proposed approximately 15.8-acre South Milliken Distribution Center Project (project) and evaluates the potential impacts to those resources that may occur as a result of project implementation. This report is intended to provide the City of Eastvale (City) in western Riverside County, California with information necessary to assess impacts to biological resources under the California Environmental Quality Act (CEQA).

2.0 PROJECT LOCATION AND DESCRIPTION

2.1 PROJECT LOCATION

The project site is located in the City, east of Milliken Avenue, north of State Route 60, and west of Interstate 15 (Figures 1 and 2). It is located in Section 6, Township 2S, Range 6W on the United States Geological Survey (USGS) Guasti, California quadrangle, 7.5-minute series topographic map. The project site is comprised of Assessor Parcels numbered 156-030-001 and 156-030-002.

The project site is within the boundaries of the Jurupa Area Plan of the Western Riverside County Multiple Species Habitat Conservation Plan (MSHCP). It is in Independent Criteria Cell 35 of Subunit 3 (Delhi Sands Area). The project site is also located in a Narrow Endemic Plant Species Survey Area (NEPSSA) and in the Burrowing Owl (*Athene cunicularia*) Survey Area.

2.2 PROJECT DESCRIPTION

This proposed project is an approximately 273,636 square foot (SF) industrial warehouse/logistics building. The building would include an 8,000 SF, two-story office, 29 dock doors positioned on the south side of the building, 67 truck trailer parking stalls, 165 passenger vehicle parking stalls, water detention basins, drive aisles, and associated landscaping. Ground disturbance during construction would occur on approximately 14.15 acres of disturbed land on the project site, and the impact would be permanent. The remaining 1.62 acres of the site would be avoided. The avoidance areas include the concrete-lined channel in the southern portion of the site (0.09 acre), a portion of an existing Edison utility easement (1.3 acres), and other area on the site (0.23 acre). There would be no temporary impacts associated with proposed project construction.

3.0 METHODS

This section provides a summary of the methods used to evaluate the existing conditions on the project site.

3.1 BACKGROUND RESEARCH

Prior to conducting biological fieldwork, background research was conducted to obtain information on the existing biological conditions within the project site vicinity. Background research included a review of current local, State, and federal regulations, historic and current aerial imagery, USGS topographic maps, U.S. Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) soil survey maps, and the MSHCP.

A query of the MSHCP Geographic Information System was made. Additionally, a query of the California Natural Diversity Data Base (CNDDB) was made to identify sensitive biological resources known from the Guasti quadrangle/vicinity (Appendix A). The CNDDB, which is administered by the California Department of Fish and Wildlife (CDFW), provides an inventory of vegetation communities, plant species, and wildlife species that are considered sensitive by State and federal resource agencies, academic institutions, and other conservation groups. Historic occurrences of sensitive species from the proposed project vicinity were used to determine species with potential to occur on and adjacent to the project site. Lastly, a report for the site was produced using Riverside County Integrated Project (RCIP) Conservation Summary Report Generator (Appendix B) to determine what types of habitat assessments or surveys would need to be conducted.

3.2 BIOLOGICAL SURVEYS

Fieldwork included a focused survey for the burrowing owl, NEPSSA species, and the Delhi Sands flower-loving fly (DSF; year one of a two-year survey). An assessment of Riparian/Riverine and Vernal Pool Resources was also performed as during the NEPSSA survey. The entire project site was surveyed on foot. The fieldwork conducted during the visits is described in the sections following Table 1. Representative photographs of the site taken during the fieldwork are included in Appendix C. Lists of plant and animal species observed/detected are in Appendices D and E, respectively

Figure 1

Regional Location

SOUTH MILLIKEN DISTRIBUTION CENTER

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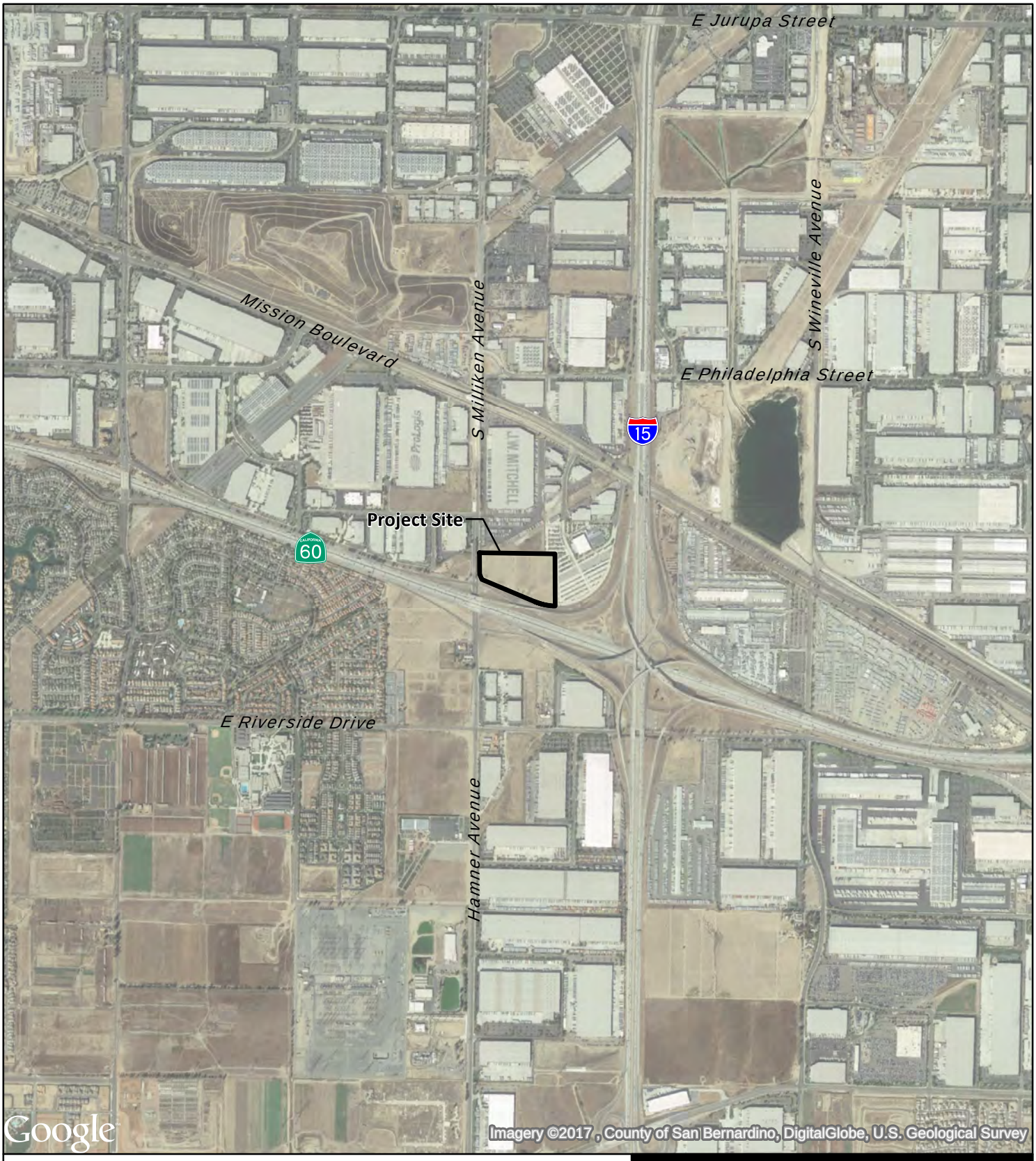

Figure 2

Project Location

SOUTH MILLIKEN DISTRIBUTION CENTER

N
W E
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0 1,000 2,000 Feet

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Table 1 SURVEY INFORMATION				
Survey Type	**Date**	**Biologist**	**Time** (start/stop)	**Weather Conditions** (start/stop)
BUOW Site Visit 1	3/20/17	Greg Stratton	0615/1015	58°F, wind 1-3 mph, 100% cloudy ; 67°F, wind 1-3 mph, 100% cloudy
BUOW Site Visit 2	3/24/17	Greg Stratton	0615/0945	48°F, wind 1-3 mph, clear; 62°F, wind 1-3 mph, clear
BUOW Site Visit 3	3/27/17	Greg Stratton	0615/1000	58°F, wind 1-3 mph, 80% cloudy; 62°F, wind 1-3 mph, 70% cloudy
BUOW Site Visit 4	3/29/17	Adam DeLuna	0615/0945	52°F, wind 1-3 mph, clear; 80°F, wind 1-3 mph, clear
Sensitive Plants Species & Riparian/Riverine	3/27/17	Sandy Leatherman Greg Stratton	NA	NA
Sensitive Plant Species	7/27/17	Sandy Leatherman, Brian Leatherman	NA	NA
DSF Survey Year one of a two-year survey	7/1/17 through 9/20/17 (Appendix F)	Ken Osborne Rick Rogers David Faulkner Jeremiah George Eric Renfro	See Appendix F	See Appendix F

3.2.1 Sensitive Plants

The project site is within the NEPSSA. According to the report generated using the RCIP Conservation Summary Report Generator, San Diego ambrosia (*Ambrosia pumila*; federal listed endangered, California Native Plant Society [CNPS] Rare Plant Rank 1B.1), Brand's phacelia (*Phacelia stellaris*; CNPS Rare Plant Rank 1B.1), and San Miguel savory (*Clinopodium* [*Satureja*] *chandleri*; CNPS Rare Plant Rank 1B.2) habitat may be present on site. As shown in Table 1, focused surveys for NEPSSA species were conducted on March 27 and July 27, 2017.

The plant surveys were conducted following the 2006 California Department of Fish and Game *Guidelines for Assessing the Effects of Proposed Project on Rare, Threatened, and Endangered Plants and Natural Communities* and the 2001 CNPS *Botanical Survey Guidelines.* The surveys were performed during spring and summer when most plant species would be detectable. A NEPSSA survey report is provided in Appendix G.

3.2.2 Burrowing Owl Survey

Since the entire site is within the MSHCP Burrowing Owl Survey Area, and California ground squirrel (*Otospermophilus beecheyi*) burrows and suitable habitat are present, the entire site was considered potential habitat and surveyed on foot for the burrowing owl (see Section 5.1.2 of this report, *Burrowing Owl Analysis*). A buffer zone around the site to the north where potential habitat occurs was also surveyed on foot (or by using binoculars where direct access was blocked by fencing and no trespassing signs). The areas immediately east, south, and west of the site are developed and were not surveyed. The survey was conducted according to the *Burrowing Owl Survey Instructions for the Western Riverside MSHCP* (Riverside County 2006)

Transects were walked at approximately 15-meter intervals across the entire project site and accessible buffer area to the north in both north-south and east-west directions. The entire survey area was scanned with binoculars extensively before each site visit and periodically throughout the transects. The site and buffer were surveyed for potential burrows, artificial refugia, or perches that could be used by the owl, and also for the burrowing owl. Special attention was paid to areas, where squirrel activity or burrows was observed. Determination of owl presence is made by direct owl observation or by owl sign such as, but not necessarily limited to, excavated soil, whitewash (excrement), castings (pellets), and/or feathers (CDFW 2012).

3.2.3 Delhi Sands Flower-loving Fly Surveys

The site is located within Independent Criteria Cell 35 of Subunit 3 (Delhi Sands Area) of the Jurupa Area Plan of the MSHCP, and Delhi Sands are present on site. In accordance with the objectives in Table 9-2 of the MSHCP, Ken Osborne (USFWS permit #TE837760-10) conducted a habitat assessment for the DSF on site on June 6, 2017 and concluded that the site has potential to support a population of DSF (Appendix H). Therefore, a survey for the DSF was conducted by Mr. Osborne et al. in accordance with the *Interim General Survey Guidelines for the Delhi Sands flower-loving Fly* (USFWS 1996) per the MSHCP (Appendix F).

3.2.4 Riparian/Riverine and Vernal Pool Resources

During the first NEPSSA survey (Table 1), the project site was inspected for Riparian/Riverine and Vernal Pool Resources, as well as any features that have potential to be considered Waters of the U.S. (WUS) or Waters of the State (WS) under the jurisdiction of the U.S. Army Corps of Engineers (Corps) and/or CDFW, respectively. WUS and WS encompass wetlands but also may include ephemeral and intermittent streams that may or may not be vegetated. The entire site was surveyed on foot for these resources.

Aerial photographs (current and historic), topographic maps, and soils maps were also reviewed for any sign of potential for flowing or ponded water, topographic depressions, and drainage features. The National Wetlands Inventory database also was queried for the site to determine if wetland/streambed features had been mapped on site in the past. The on-site evaluation consisted of a directed search for field characteristics indicative of riparian/riverine or vernal pool habitats. Field indicators may include wetland/riparian plant species, drainage courses, drainage patterns, ponded water, changes in soil character, changes in vegetation character, or water-borne debris deposits.

3.3 SURVEY LIMITATIONS

Few survey limitations exist for the project site. Since the site visits were conducted during daylight hours, the presence of nocturnal animals and most rodents could be determined only by indirect sign (e.g., tracks, scat, or burrows). A complete list of these species would require night surveys and trapping, but these surveys and trapping are not warranted because the potential to occur and the sensitivity of animals that might be detected are both low.

3.4 NOMENCLATURE

Nomenclature used in this report generally follows Baldwin et al. (2012) for scientific names of plants, while common names generally follow the California Native Plant Society (CNPS 2017) or the Jepson Flora Project (2017). Other conventions used in this report generally follow Holland (1986) for vegetation communities, Collins and Taggart (2009) for reptiles, American Ornithologists' Union (2016) for birds, and Baker et al. (2003) for mammals. Plant species status is taken from CNPS (2017). Animal species status is from CDFW (2017).

4.0 RESULTS

This section describes the existing conditions on the project site including a physical description of the site, vegetation, plant species, and animal species.

4.1 PHYSICAL DESCRIPTION AND LAND USE

There is no native habitat on or adjacent to the project site. The western portion of the site supports an abandoned grape vineyard; the eastern portion of the site supports other abandoned agriculture. The site shows evidence of periodic plowing. Based on a review of historic aerials, the project site and surrounding area have been in agricultural production back to as early as 1938, with urban development beginning to occur in the area between 1967 and 1994 (Nationwide Environmental Title Research, LLC [NETR] 2017). The project site is currently bordered by State Route 60 to the south, Milliken Avenue and industrial buildings to the north and west, and a large commercial parking lot to the east. Undeveloped lots similar to the site occur to the south on the other side of State Route 60 (Figure 2).

The site is nearly flat with elevations on site that range from approximately 805 to 815 feet above mean sea level. A portion of one electrical utility easement crosses the extreme northwest corner of the site, and a second, 100-foot wide electrical utility easement crosses the southeastern portion of the site. A transmission line tower is present on site in this second corridor. There are also two elevated billboards on site. One is near the transmission line tower; the other is in the southwest corner of the site.

There are no natural drainage features on site, but the site does contain a concrete-lined channel along the southern side of the property. Soils on the site are mapped (Figure 3) as Delhi fine sand, Delhi find sand (two to 15 percent slopes, wind eroded), and Gorgonio loamy sand (deep, two to eight percent slopes; USDA NRCS 2015). Ken Osborne notes, however, that his field observations determined that Delhi sand soils extend over the entire site, and soil differences are not apparent across the site (Appendix H).

4.2 VEGETATION COMMUNITIES/LAND COVER TYPES

The site does not support any native or sensitive vegetation communities. Rather, the entire site supports disturbed land that is the result of previous agricultural operations that have been abandoned (Figure 4).

4.3 PLANT SPECIES OBSERVED

Twenty-seven plant species were observed on site (11 native and 16 non-native; Appendix D). The site has a long history of agricultural use, and the entire site shows signs of this previous disturbance and evidence of plowing. There are no undisturbed soils or native habitats on site that are likely to support sensitive plants. No NEPSSA or other sensitive plant species were observed or are anticipated to occur on the site due to a lack of potential habitat or the site's disturbed condition.

4.4 ANIMAL SPECIES OBSERVED OR DETECTED

Thirty animal species (two insects, one reptile, 25 birds [one of which is sensitive], and two mammals) were observed or detected on site during all surveys except the year-one DSF survey. A list of all these animal species observed or detected is included in Appendix E. During the year-one DSF survey, 101 additional insect species were observed (Appendix F).

The sensitive species observed is the California horned lark (*Eremophila alpestris actia*), which is a CDFW Watch List species and an MSHCP Covered Species. California horned lark occurs within the MSHCP Plan Area as a breeding and wintering resident, and the MSHCP Conservation Area will provide adequate habitat for foraging and nest sites. The burrowing owl was not observed or detected on site. See section 5.1.2 of this report, *Burrowing Owl Analysis*, for more information. As of the conclusion of the first DSF survey in September 2017, no DSF have been observed. USFWS protocol requires that a second consecutive season of survey with negative results is necessary to conclude that a site does not support the DSF. A second survey is planned for summer 2018.

4.5 JURISDICTIONAL AREAS

The site is flat and does not support any natural drainages, swales, creeks, ponds, streambeds, or other riparian or wetland habitat features. The concrete-lined channel that does occur on site is man-made in a historically upland area (based on a review of historic aerial photography and USGS maps) and supports no riparian or wetland plant species. The channel would not be impacted by the proposed project. Off-site, water in the channel flows into an underground storm drain pipe at the southeastern portion of the Project site. From this point, the storm drain line passes under the SR-60 freeway through a CALTRANS box structure and parallels the west side of I-15 as County Flood Control Storm Drain Line E2. Line E2 runs south to a large Retarding RCFC Basin, which outlets overland for a short distance through an area where a connection to the existing RCFC County Line Channel (along Bellegrave Avenue) will be completed. The RCFC County Line Channel ties in to the Cucamonga Creek Channel (SB Flood Control). From this location the water flows south downstream, eventually discharging into Mill Creek, a tributary to the Santa Ana River. Because the Santa Ana River is a Riparian/Riverine resource

Figure 3

Soils

SOUTH MILLIKEN DISTRIBUTION CENTER

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Figure 4

Vegetation and Impacts

SOUTH MILLIKEN DISTRIBUTION CENTER

N
W E
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0 100 200 Feet

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and water from the on-site channel eventually reaches the river, the connectivity qualifies the on-site channel as a Riverine resource, and potentially subject to jurisdiction by the Corps and/or CDFW even though no Riparian habitat is present in the on-site channel. The proposed project would avoid impacts to this channel. No impacts to Riparian or Riverine resources or jurisdictional features would occur. Therefore, the project would not require Corps or CDFW permits. See Section 5.4 of this report, *Riparian/Riverine and Vernal Pool Requirements*, for more information.

5.0 MSHCP COMPLIANCE

5.1 MSHCP HABITAT ASSESSMENT/SURVEY REQUIREMENTS

The project site is located within the boundaries of the Jurupa Area Plan and is within Independent Criteria Cell 35 (Figure 5). Required habitat assessments/species surveys for the project site were identified by conducting generating a report for the site using the RCIP Conservation Summary Report Generator (Appendix B and Figure 5).

5.1.1 Sensitive Plant Species

The site is located within the NEPSSA. According to the report generated using the RCIP Conservation Summary Report Generator, San Diego ambrosia, Brand's phacelia, and San Miguel savory habitat may be present on site. As presented in Table 2, there is no habitat on site for Brand's phacelia or San Miguel savory on site, and San Diego ambrosia has limited potential to occur. No other sensitive species were observed on site, and none is expected given the disturbed nature of the site.

5.1.2 Burrowing Owl Analysis

The site is within the MSHCP Burrowing Owl Survey Area, and since the site supports potential habitat, a focused, breeding season burrowing owl survey was conducted (Table 1; Appendix I). While eleven active California ground squirrel burrows were observed, along with a pile of discarded tires and a fallen billboard that could act as artificial refugia for the burrowing owl (Appendix I), no burrowing owls or burrowing owl sign were observed. Other locations in the survey area that appeared to have digging activity were either too small for the burrowing owl, were dug up by coyotes (*Canis latrans*) or dogs (*Canis familiaris*), or had collapsed due to the sandy soil. While the burrowing owl and owl sign was not found, a pre-construction survey would be required to ensure that no owls are present at the time of site development.

Table 2 SENSITIVE PLANT SPECIES POTENTIAL TO OCCUR				
Species	**Sensitivity***	**Habitat(s)**	**Bloom Period**	**Potential to Occur**
San Diego ambrosia	FE CNPS RPR 1B.1	Open floodplain terraces or margins of vernal pools dominated by sparse, non-native grasslands or ruderal habitat with gravelly, fine, sandy loams or alkali playas.	April to October	The site supports ruderal habitat with sandy soils, but due to the history of site disturbance, the species has limited potential to occur. There has been no record of this species reported to the CNDDB on site or in the vicinity.
Brand's phacelia	CNPS RPR 1B.1	Sandy washes and or benches in alluvial flood plains with periodic flooding.	March to June	Not expected, species' habitats are not present; the species is known currently from only approximately 10 occurrences per CNPS as of October 2016; and the species has not been reported to the CNDDB on site. It was reported to the CNDDB in Rancho Cucamonga, San Bernardino County, in 2003 in a location that is now developed, and it may be extirpated.
San Miguel savory	CNPS RPR 1B.2	Coastal sage scrub, chaparral, cismontane woodland, grasslands with gabbroic and metavolcanic substrates.	March to July	Not expected because the species' habitat (soils and vegetation) does not occur on site.

*FE = federal listed endangered
CNPS RPR = California Native Plant Society Rare Plant Rank
1B = rare throughout its range with the majority of them endemic to California
0.1 = Seriously threatened in California (over 80% of occurrences threatened / high degree and immediacy of threat)
0.2 = Moderately threatened in California (20-80% occurrences threatened / moderate degree and immediacy of threat)

5.1.3 Delhi Sands Flower-loving Fly Analysis

Ken Osborne (USFWS permit #TE837760-10) conducted a habitat assessment for the DSF on site on June 6, 2017 and concluded that the site has potential to support a population of DSF (Appendix H). Therefore, a survey for the DSF was conducted by Mr. Osborne et al. per the USFWS 1996 *Interim General Survey Guidelines for the DSF* (Appendix F).

5.2 URBAN/WILDLANDS INTERFACE GUIDELINES

According to the Section 6.1.4 of the MSHCP, the Urban/Wildlands Interface Guidelines are intended to address indirect effects associated with locating development in proximity to MSHCP Conservation Areas (County of Riverside 2003). Indirect effects can occur from drainage, toxics, lighting, noise, and invasives.

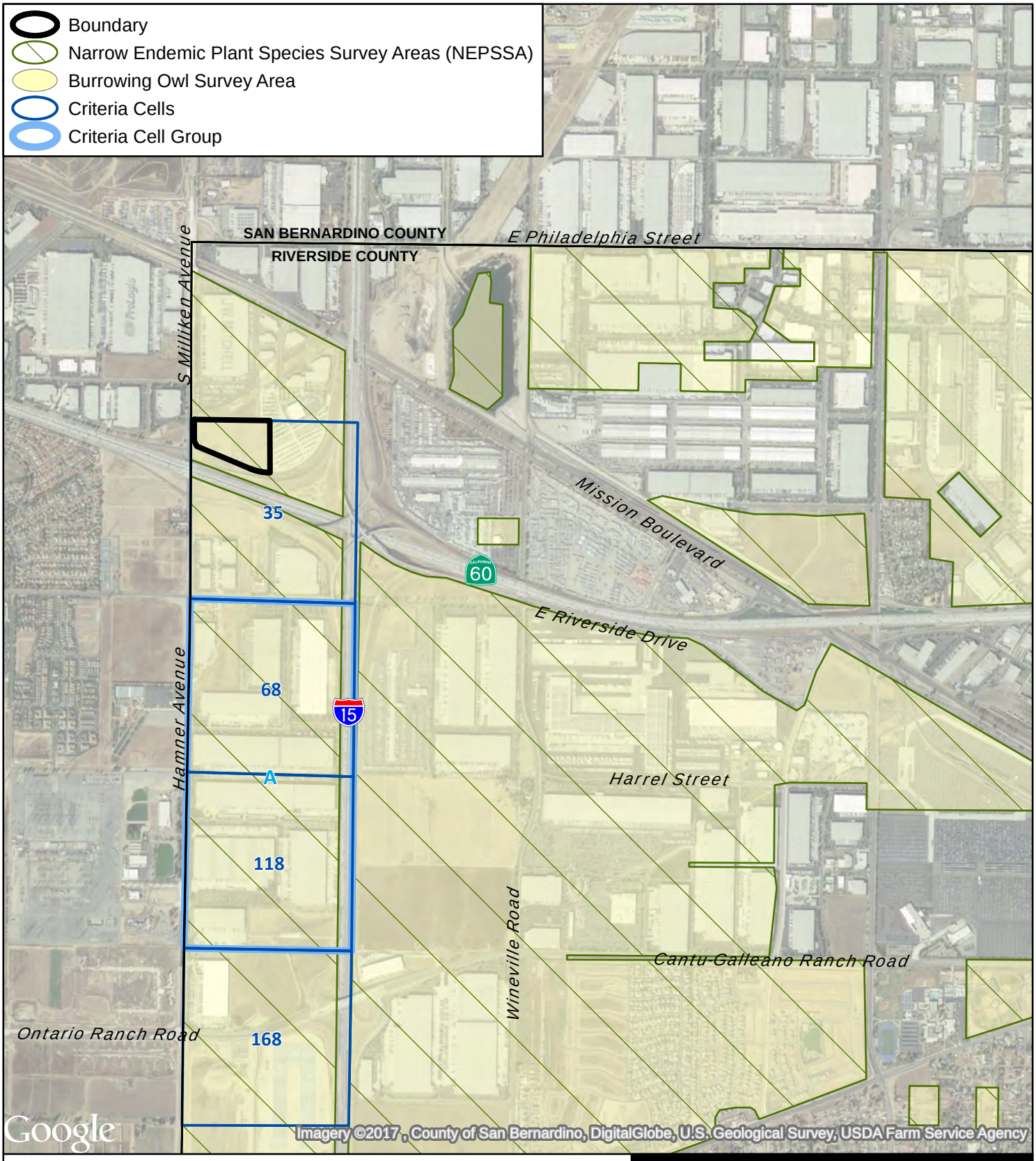

Figure 5

MSHCP Survey Areas and Cell Map

SOUTH MILLIKEN DISTRIBUTION CENTER

N
W E
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0 1,000 2,000 Feet

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The project site is located within Proposed Non-contiguous Habitat Block 1 (NCH-1) of the MSHCP Conservation Area. NCH-1 consists of two habitat blocks containing soils suitable for supporting the DSF. This habitat block is constrained by existing adjacent agricultural activities. Maintenance of Delhi sands soil series is an objective for NCH-1.

NCH-1 is not contiguous with other MSHCP Conservation Areas, and NCH-1 consists of patches of undeveloped land among developed parcels, roadways, and freeways. Milliken Avenue borders the project site to the west. State Route 60 runs along the project site's southern border. A large parking lot borders the site to the east and northeast, and beyond a small area of disturbed, undeveloped land to the north, lies a commercial distribution center. The undeveloped land to the north of the project site is the only area within NCH-1 where potential indirect edge effects to NCH-1 could occur from the project.

Treatment and management of edge conditions will be necessary to maintain intact habitat blocks of Delhi sands. Therefore, the project must address the guidelines pertaining to the Urban/Wildlands Interface, which include edge effects such as toxics and lighting as outlined below. Also, because water that flows in the on-site concrete-lined drainage channel, which will not be impacted by the proposed project, flows downstream and eventually connects to the Santa Ana River, the channel is considered a Riverine resource and subject to applicable Urban/Wildlands Interface Guidelines.

Drainage and Toxics

The project would implement measures, including those required through the National Pollutant Discharge Elimination System requirements, to ensure that the quantity and quality of runoff discharged from the site is not altered in an adverse way when compared with existing conditions.

Lighting

If lighting is included along the northern border of the site, it will be selectively placed, shielded and directed onto the project site to avoid shining into the undeveloped land to the north.

Noise

The site is largely surrounded by existing development that includes Milliken Avenue and State Route 60, which are existing noisy facilities, and a short distance to the north and adjacent to the undeveloped land north of the site, is an existing distribution facility. The incremental increase in noise from construction and operation of the project would not have a substantial effect on the undeveloped land immediately north of the site.

Invasives

No plants included on the California Invasive Plant Council's list of invasive species (or in Table 6-2 of the MSHCP) will be used in the landscaping on site.

5.3 MSHCP AND RESERVE ASSEMBLY CRITERIA

The project site is within Independent Criteria Cell 35 within Subunit 3 (Delhi Sands Area) of the Jurupa Area Plan (Appendix B). The following biological issues and conditions for the DSF and the Los Angeles pocket mouse (*Perognathus longimembris brevinasus*) are prescribed for Independent Criteria Cell 35 in Subunit 3 in Section 3.3.6, Jurupa Area Plan, of the MSHCP.

- Conserve Delhi Sands soil series occurring within agricultural lands along the western and northeastern boundary of the Jurupa Area Plan to support known locations of the DSF.

  The project site is a known locality of the DSF in a Core Area (i.e., "the northwestern corner of the Plan Area near Hamner Avenue and SR-60") per the MSHCP. The MSHCP states that conservation for the DSF will occur according to the process described in Table 9-2 of the MSHCP.

  The biologists that conducted the first-year survey in summer 2017 (out of two required years of survey) did not observe the DSF on site. The second-year survey is planned for summer 2018. The determination of the presence or absence of the DSF requires the results of both of these surveys. If the DSF is observed during the second-year survey, the DSF would be considered present on site, and conservation would be required under the MSHCP (see below). If the DSF is not observed during the second-year survey, the DSF would be considered absent from the site, and conservation would not be required.

  If the DSF is determined to be present on site, the project proponent would work with the City and USFWS to: 1) determine the appropriate conservation per the process described in Table 9-2 of the MSHCP for the DSF or 2) develop other acceptable options for conservation. Table 9-2 includes three options (objectives) for conservation for the DSF. Generally, Objective 1A conserves known localities of DSF within Core Areas; Objective 1B conserves locations where presence of DSF is determined by surveys; and Objective 1C allows for take of DSF along with on-site conservation.

- Determine presence of potential localities for Los Angeles pocket mouse in sandy washes and dune areas.

  The Los Angeles pocket mouse appears to be limited to sparsely vegetated habitat areas in patches of fine sandy soils associated with washes or of windblown origin, such as dunes (County of Riverside 2003). While appropriate soils are present on the project site (Figure 3), the site has been disturbed by agricultural practices going back to at least 1938; there are no washes (or dune areas) on site; and there is no native habitat present. Habitat types associated with MSHCP database records for the species include non-native grassland, Riversidean sage scrub, Riversidean alluvial fan sage scrub, chaparral, and redshank chaparral. None of these habitats is present on site. Therefore, the project site is not a potential locality for the Los Angeles pocket mouse.

- Maintain Core and Linkage Habitat for the DSF.

  According to the Conservation Summary Report Generator (Appendix B), the project site is not in a special linkage area.

The project site is not a potential locality for the Los Angeles pocket mouse, and the project site is not in a special linkage area. If the DSF is determined to be present on site, the project proponent would work with the City and USFWS to determine appropriate conservation for the DSF, and the conservation would be done through the Property Owner-initiated Habitat Evaluation and Acquisition Negotiation Strategy (HANS) Process. Therefore, the proposed project will not conflict with MSHCP conservation objectives of the Jurupa Area Plan.

5.4 RIPARIAN/RIVERINE AND VERNAL POOL REQUIREMENTS

Section 6.1.2 of the MSHCP describes the process to protect species associated with Riparian/Riverine and Vernal Pool Resources. As defined in the MSHCP, riparian/riverine areas are lands that contain habitat dominated by trees, shrubs, persistent emergents, or emergent mosses and lichens that occur close to or depend on a nearby freshwater source or areas that contain a freshwater flow during all or a portion of the year. As defined in the MSHCP, vernal pools are seasonal wetlands that occur in depression areas that have wetlands indicators of all three parameters (soils, vegetation and hydrology) during the wetter portion of the growing season but normally lack wetlands indicators of hydrology and/or vegetation during the drier portion of the growing season. Riparian/Riverine and Vernal Pool Resources may support one or more of the species listed in Section 6.1.2 of the MSHCP.

While the project site does have a concrete-lined channel within which water flows, it does not support water-dependent vegetation (see photos in Appendix C). The proposed project would avoid impacts to this channel. The water appears to originate from runoff from adjacent developed land to the east where it flows underground in a pipe across the southeastern portion of the site. The pipe becomes an above-ground concrete-lined channel for approximately 360 feet near the southern boundary of the site and then turns to the southwest off site where water in the channel flows into an underground storm drain pipe at the southeastern portion of the Project site. From this point, the storm drain line passes under the SR-60 freeway through a CALTRANS box structure and parallels the west side of I-15 as County Flood Control Storm Drain Line E2. Line E2 runs south to a large Retarding RCFC Basin, which outlets overland for a short distance through an area where a connection to the existing RCFC County Line Channel (along Bellegrave Avenue) will be completed. The RCFC County Line Channel ties in to the Cucamonga Creek Channel (SB Flood Control). From this location the water flows south downstream, eventually discharging into Mill Creek, a tributary to the Santa Ana River.

Because the Santa Ana River is a Riparian/Riverine resource and water from the on-site channel eventually reaches the river, the connectivity qualifies the on-site channel as a Riverine resource, and potentially subject to jurisdiction by the Corps and CDFW, even though no Riparian habitat is present in the on-site channel. The proposed project would avoid impacts to this channel. No impacts to Riparian or Riverine resources or jurisdictional features would occur. No riparian/riverine habitat occurs along the on-site channel, and none is observable using Google Earth in an immediate upstream or downstream direction. The MSHCP requires focused surveys

for sensitive riparian bird species when suitable riparian habitat would be affected. Given that there are no riparian/riverine features on or adjacent to the site, sensitive riparian bird surveys are not required.

There are three known sensitive fairy shrimp species that occur in western Riverside County: Riverside (*Strephtocephalus woottoni*), Santa Rosa Plateau (*Linderiella santarosae*), and vernal pool (*Branchinecta lynchi*) fairy shrimp. These species of fairy shrimp typically occur in vernal pools over Willows, Travers, or Domino soils, with Riverside fairy shrimp also being known to occur on Murrieta stony clay loams, Las Posas series, and Wyman clay loam. The Santa Rosa Plateau fairy shrimp is only known to occur on seasonal southern basalt flow vernal pools. The vernal pool fairy shrimp is narrowly distributed with suitable habitat being known from three key locations: Santa Rosa Plateau Ecological Reserve, Skunk Hollow, and Salt Creek in west Hemet. The project site was searched for vernal pools or ephemeral ponds that could support fairy shrimp habitat. The sandy soils on site, however, are not conducive to ponding. Still, the habitat search included such indicators as basins, ruts, cracked mud, algal mats, and drift lines; none of which was observed. No vernal pools or ephemeral ponding capable of supporting fairy shrimp species is present; therefore, no surveys for fairy shrimp species are required.

The MSHCP requires analysis of project impacts to Riparian/Riverine and Vernal Pool Resources through the preparation of a Determination of Biological Superior or Equivalent Preservation (DBESP). However, as there are no impacts to these resources, a DBESP is not required.

6.0 MITIGATION MEASURES

6.1 MITIGATION MEASURES

Compliance with the requirements of Section 6.0 of the MSHCP is intended to provide full mitigation under CEQA, the National Environmental Policy Act (NEPA), the California Endangered Species Act (CESA), and the federal Endangered Species Act (FESA) for impacts to species and habitats covered by the MSHCP, pursuant to agreements with the USFWS and the CDFW, as set forth in the implementing agreement for the MSHCP.

The following standard mitigation conditions would reduce project-related impacts to MSHCP covered species and other biological resources to less than significant:

1. The project applicant will pay the development mitigation fee associated with the MSHCP, which will be based on the number of acres affected. The fee will be paid during the processing of the proposed project.

2. 30 days prior to grading, a qualified biologist shall conduct a survey of suitable habitat on site and make a determination regarding the presence or absence of the burrowing owl. The determination shall be documented in a report and shall be submitted, reviewed, and accepted by the City of Eastvale prior to the issuance of a grading permit and subject to the following provisions listed below. If burrowing owls have colonized the project site prior to the initiation of construction, the project proponent should immediately inform the RCA and Wildlife Agencies, and would need to coordinate further with RCA and the Wildlife Agencies, including the possibility of preparing a Burrowing Owl Protection and Relocation Plan, prior to initiating ground disturbance.

    a. In the event that the pre-construction survey identifies no burrowing owls on the property, a grading permit may be issued without restriction.
    b. In the event that the pre-construction survey identifies the presence of burrowing owl, then prior to the issuance of a grading permit and prior to the commencement of ground-disturbing activities on the property, the qualified biologist shall implement mitigation in accordance with the MSHCP requirements and as directed by the RCA and Wildlife Agencies.

3. Vegetation clearing and ground disturbance shall be prohibited during the migratory bird nesting season (February 1 through September 15), unless a migratory bird nesting survey is completed in accordance with the following requirements:

    a. A migratory nesting bird survey of the Project's impact footprint, including suitable habitat within a 500-foot radius, shall be conducted by a qualified biologist within three (3) days prior to initiating vegetation clearing or ground disturbance.
    b. A copy of the migratory nesting bird survey results report shall be provided to the City of Eastvale. If the survey identifies the presence of active nests, then the qualified biologist shall provide the County with a copy of maps showing the location of all nests and an appropriate buffer zone around each nest sufficient to protect the nest from direct and indirect impact. The size and location of all buffer zones, if required, shall be subject to review and approval by the County and shall be no less than a 300-foot radius around the nest for non-raptors and a 500-foot radius around the nest for raptors. The nests and buffer zones shall be field checked weekly by a qualified biological monitor. The approved buffer zone shall be marked in the field with construction fencing, within which no vegetation clearing or ground disturbance shall commence until the qualified biologist verifies that the nests are no longer occupied and the juvenile birds can survive independently from the nests.

4. Prior to any disturbance on the proposed project site, a second year of focused surveys for Delhi Sands flower-loving fly shall be conducted from July to September 2018 by a USFWS-permitted biologist. Survey results shall be submitted to the City of Eastvale and the Western Riverside County Regional Conservation Authority (RCA) referencing JPR 17-06-08-01 (PLN17-20013/South Milliken Distribution Center).

a. If the results of the second year of focused surveys are negative, no further surveys or mitigation shall be required.
b. If the survey results are positive, the applicant shall consult with the RCA, CDFW, and USFWS (the latter two herein referred to as the "Wildlife Agencies") for final determination of conservation viability on-site.

    i. If the RCA and the Wildlife Agencies conclude the site is viable for conservation, the applicant shall conserve 75 percent of the mapped Delhi Soils (or 75 percent of the extent of occupied habitat if not consistent with mapped soils) on the project site.

    ii. If the RCA and the Wildlife Agencies conclude that conservation on the project site is not feasible or would not provide long-term conservation value for Delhi Sands flower-loving fly, then the applicant shall mitigate the loss of mapped Delhi Soils (or occupied habitat) at a 3:1 ratio through the purchase of credits from the Colton Dunes Conservation Bank or other Wildlife Agency-approved conservation bank.

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Appendix A
CNDDB SUMMARY TABLE

SOUTH MILLIKEN DISTRIBUTION CENTER PROJECT SITE

Appendix A
CNDDB SUMMARY TABLE

SNAME	CNAME	KQUADNAME	KEYCOUNTY	SITEDATE
Agelaius tricolor	tricolored blackbird	Guasti	SBD	20140426
Anniella pulchra pulchra	silvery legless lizard	Guasti	SBD	19930325
Athene cunicularia	burrowing owl	Guasti	RIV	20000916
Athene cunicularia	burrowing owl	Corona North	RIV	20000917
Athene cunicularia	burrowing owl	Guasti	SBD	20060504
Athene cunicularia	burrowing owl	Guasti	SBD	20040510
Athene cunicularia	burrowing owl	Guasti	SBD	20110724
Athene cunicularia	burrowing owl	Guasti	SBD	20160209
Athene cunicularia	burrowing owl	Guasti	SBD	201305XX
Athene cunicularia	burrowing owl	Guasti	SBD	20110706
Athene cunicularia	burrowing owl	Guasti	SBD	20110321
Athene cunicularia	burrowing owl	Guasti	SBD	2003XXXX
Athene cunicularia	burrowing owl	Guasti	SBD	20031002
Athene cunicularia	burrowing owl	Guasti	SBD	20070714
Athene cunicularia	burrowing owl	Guasti	RIV	20100826
Athene cunicularia	burrowing owl	Guasti	SBD	20110815
Athene cunicularia	burrowing owl	Guasti	SBD	20110308
Athene cunicularia	burrowing owl	Guasti	SBD	20040707
Calochortus plummerae	Plummer's mariposa-lily	Fontana	RIV	19980624
Chaetodipus fallax fallax	northwestern San Diego pocket mouse	Mt. Baldy	SBD	20020413
Chorizanthe parryi var. parryi	Parry's spineflower	Guasti	SBD	19980702
Cladium californicum	California saw-grass	Guasti	SBD	19180704
Dipodomys merriami parvus	San Bernardino kangaroo rat	Guasti	SBD	19350107
Dipodomys stephensi	Stephens' kangaroo rat	Guasti	RIV	20130411
Eumops perotis californicus	western mastiff bat	Guasti	SBD	19920831
Horkelia cuneata var. puberula	mesa horkelia	Cucamonga Peak	SBD	19250304
Lasiurus xanthinus	western yellow bat	Guasti	SBD	19840912
Muhlenbergia californica	California muhly	Guasti	SBD	191610XX
Navarretia prostrata	prostrate vernal pool navarretia	Guasti	SBD	19180425
Neotoma lepida intermedia	San Diego desert woodrat	Mt. Baldy	SBD	20020413

SNAME	CNAME	KQUADNAME	KEYCOUNTY	SITEDATE
Neotoma lepida intermedia	San Diego desert woodrat	Guasti	SBD	20021129
Perognathus longimembris brevinasus	Los Angeles pocket mouse	Guasti	SBD	19990806
Perognathus longimembris brevinasus	Los Angeles pocket mouse	Guasti	SBD	20010907
Perognathus longimembris brevinasus	Los Angeles pocket mouse	Guasti	SBD	20030207
Perognathus longimembris brevinasus	Los Angeles pocket mouse	Guasti	SBD	19991002
Phacelia stellaris	Brand's star phacelia	Guasti	SBD	20030131
Phrynosoma blainvillii	coast horned lizard	Guasti	SBD	19910630
Phrynosoma blainvillii	coast horned lizard	Guasti	SBD	19990811
Phrynosoma blainvillii	coast horned lizard	Guasti	SBD	19980907
Polioptila californica californica	coastal California gnatcatcher	Guasti	SBD	19990916
Pseudognaphalium leucocephalum	white rabbit-tobacco	Guasti	SBD	18910528
Rhaphiomidas terminatus abdominalis	Delhi Sands flower-loving fly	Fontana	RIV	20060828
Rhaphiomidas terminatus abdominalis	Delhi Sands flower-loving fly	Fontana	RIV	200607XX
Rhaphiomidas terminatus abdominalis	Delhi Sands flower-loving fly	Guasti	RIV	19950815
Rhaphiomidas terminatus abdominalis	Delhi Sands flower-loving fly	Guasti	SBD	20010916
Rhaphiomidas terminatus abdominalis	Delhi Sands flower-loving fly	Guasti	SBD	20010909
Rhaphiomidas terminatus abdominalis	Delhi Sands flower-loving fly	Guasti	SBD	19980823
Rhaphiomidas terminatus abdominalis	Delhi Sands flower-loving fly	Guasti	RIV	20000824
Rhaphiomidas terminatus abdominalis	Delhi Sands flower-loving fly	Guasti	RIV	198XXXXX
Rhaphiomidas terminatus abdominalis	Delhi Sands flower-loving fly	Fontana	SBD	20020917
Rhaphiomidas terminatus abdominalis	Delhi Sands flower-loving fly	Fontana	RIV	19960909
Rhaphiomidas terminatus abdominalis	Delhi Sands flower-loving fly	Fontana	RIV	20130829
Rhaphiomidas terminatus abdominalis	Delhi Sands flower-loving fly	Fontana	RIV	201008XX
Rhaphiomidas terminatus abdominalis	Delhi Sands flower-loving fly	Fontana	RIV	20050830
Rhaphiomidas terminatus abdominalis	Delhi Sands flower-loving fly	Fontana	SBD	20040319
Rhaphiomidas terminatus abdominalis	Delhi Sands flower-loving fly	Fontana	SBD	19980920
Rhaphiomidas terminatus abdominalis	Delhi Sands flower-loving fly	Fontana	SBD	19980XXX
Rhaphiomidas terminatus abdominalis	Delhi Sands flower-loving fly	Fontana	SBD	20040920
Rhaphiomidas terminatus abdominalis	Delhi Sands flower-loving fly	Fontana	SBD	201009XX
Symphyotrichum defoliatum	San Bernardino aster	Guasti	SBD	19161103

Appendix B
RIVERSIDE COUNTY INTEGRATED PROJECT (RCIP)
CONSERVATION SUMMARY REPORT

SOUTH MILLIKEN DISTRIBUTION CENTER PROJECT SITE

Riverside County Transporation and Land Management Agency - TLMA

Western Riverside County Multiple Species Habitat Conservation Plan (MSHCP)

APN	Cell	Cell Group	Acres	Area Plan	Sub Unit
156030001	Not A Part	Independent	0.01	Jurupa	Not a Part
156030001	35	Independent	12.46	Jurupa	SU3 - Delhi Sands Area
156030002	35	Independent	3.08	Jurupa	SU3 - Delhi Sands Area

HABITAT ASSESSMENTS

Habitat assessment shall be required and should address at a minimum potential habitat for the following species:

APN	Amphibia Species	Burrowing Owl	Criteria Area Species	Mammalian Species	Narrow Endemic Plant Species	Special Linkage Area
156030001	NO	**YES**	NO	NO	**YES**	NO
156030002	NO	**YES**	NO	NO	**YES**	NO

Burrowing Owl

Burrowing owl.

Narrow Endemic Plant Species

7) San Diego ambrosia, Brand's Phacelia, San Miguel savory

If potential habitat for these species is determined to be located on the property, focused surveys may be required during the appropriate season.

Background

The final MSHCP was approved by the County Board of Supervisors on June 17, 2003. The federal and state permits were issued on June 22, 2004 and implementation of the MSHCP began on June 23, 2004.

For more information concerning the MSHCP, contact your local city or the County of Riverside for the unincorporated areas. Additionally, the Western Riverside County Regional Conservation Authority (RCA), which oversees all the cities and County implementation of the MSHCP, can be reached at:

Western Riverside County Regional Conservation Authority
3403 10th Street, Suite 320
Riverside, CA 92501

Phone: 951-955-9700
Fax: 951-955-8873

www.wrc-rca.org

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Appendix C
SITE PHOTOGRAPHS
SOUTH MILLIKEN DISTRIBUTION CENTER PROJECT SITE

Appendix D

Plant Species Observed or Detected

Appendix D
PLANT SPECIES OBSERVED ON THE
SOUTH MILLIKEN DISTRIBUTION CENTER PROJECT SITE

FAMILY	SCIENTIFIC NAME	COMMON NAME
Amaranthaceae	*Amaranthus albus**	tumbleweed
Asteraceae	*Ambrosia acanthicarpa*	annual bur-sage
	Baccharis salicifolia ssp. *salicifolia*	mule fat
	Erigeron canadensis [*Conyza canadensis*]	common horseweed
	Heterotheca grandiflora	telegraph weed
	*Lactuca serriola**	prickly lettuce
	*Oncosiphon piluliferum**	stinknet
	*Sonchus oleraceus**	common sow thistle
	Verbesina encelioides var. *exauriculata**	golden crown beard
Boraginaceae	*Amsinckia menziesii*	rigid fiddleneck
	Pectocarya linearis ssp. *ferocula*	slender pectocarya
	Plagiobothrys sp.	popcorn flower
Brassicaceae	*Hirschfeldia incana**	shortpod mustard
	*Sisymbrium irio**	London rocket
	*Sisymbrium orientale**	hare's ear cabbage
Chenopodiaceae	*Chenopodium album**	lamb's quarters
	*Salsola tragus**	Russian thistle
Crassulaceae	*Crassula connata*	pygmy-weed
Euphorbaceae	*Croton californicus*	California croton
Fabaceae	*Acmispon americanus*	Spanish lotus
Onagraceae	*Camissonia bistorta*	suncup
Poaceae	*Bromus diandrus**	ripgut grass
	Bromus madritensis ssp. *rubens**	red brome
	Hordeum murinum var. *leporinum**	hare barley
	*Hordeum vulgare**	common barley
	*Schismus barbatus**	Mediterranean schismus
Polygonaceae	*Rumex hymenosepalus**	wild-rhubarb
Simaroubaceae	*Ailanthus altissima**	tree of heaven
Solanaceae	*Datura wrightii*	Jimson weed
Urticaceae	*Urtica urens**	dwarf nettle
Vitaceae	*Vitis vinifera**	grape
Zygophyllaceae	*Tribulus terrestris**	puncture vine

*Non-native species

Appendix E

Animal Species Observed or Detected

Appendix E
ANIMAL SPECIES OBSERVED OR DETECTED ON THE SOUTH MILLIKEN DISTRIBUTION CENTER PROJECT SITE

SCIENTIFIC NAME	COMMON NAME
VERTEBRATES	
Invertebrates	
Asilidae	
Stenopogon lomae	robber fly
Crabronidae	
Bembix sp.	sand digging wasps
Reptiles	
Phrynosomatidae	
Sceloporus occidentalis	western fence lizard
Birds	
Columbidae	
Columba livia	rock dove
Zenaida macroura	mourning dove
Corvidae	
Corvus brachyrhynchos	American crow
Corvus corax	common raven
Alaudidae	
*Eremophila alpestris actia**	California horned lark
Hirundinidae	
Stelgidopteryx serripennis	northern rough-winged swallow
Mimidae	
Mimus polyglottis	northern mockingbird
Passeridae	
Passer domesticus	house sparrow
Tyrannidae	
Sayornis nigricans	black phoebe
Sayornis saya	Say's phoebe
Tyrannus vociferans	Cassin's kingbird
Tyrannus verticalis	western kingbird
Sturnidae	
Sturnus vulgaris	European starling
Motacillidae	
Anthus rubescens	American pipit
Parulidae	
Setophaga coronata	yellow-rumped warbler
Emberizidae	
Zonotrichia leucophrys	white-crowned sparrow
Icteridae	
Euphagus cyanocephalus	Brewer's blackbird
Molothrus ater	brown-headed cowbird

Appendix E (cont.)
ANIMAL SPECIES OBSERVED OR DETECTED ON THE SOUTH MILLIKEN DISTRIBUTION CENTER PROJECT SITE

SCIENTIFIC NAME	COMMON NAME
VERTEBRATES	
Birds	
Icterus bullockii	Bullock's oriole
Fringillidae	
Haemorhous mexicanus	house finch
Spinus psaltria	lesser goldfinch
Charadriidae	
Charadrius vociferus	killdeer
Falconidae	
Falco sparverius	American kestrel
Accipitridae	
Buteo jamaicensis	red-tailed hawk
Apodidae	
Aeronautes saxatalis	white-throated swift
Mammals	
Sciuridae	
Otospermophilus beecheyi	California ground squirrel
Geomyidae	
Thomomys bottae	Botta's pocket gopher (burrows)

Appendix F

First Year Focused Survey for Delhi Sands Flower-loving Fly

FIRST YEAR FOCUSED SURVEY FOR DELHI SANDS FLOWER-LOVING FLY (*Rhaphiomidas terminatus abdominalis*) ON A 15.5-acre SOUTH MILLIKEN DISTRIBUTION CENTER SITE IN EASTVALE RIVERSIDE COUNTY, CALIFORNIA

Prepared for:

Alden Environmental, Inc
3245 University Ave., #1188
San Diego, CA 92104

Prepared by:

Kendall H. Osborne
Osborne Biological Consulting
6675 Avenue Juan Diaz
Riverside, CA 92509

October 18, 2017

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FIRST YEAR FOCUSED SURVEY FOR DELHI SANDS FLOWER-LOVING FLY (*Rhaphiomidas terminatus abdominalis*) ON A 15.5-acre SOUTH MILLIKEN DISTRIBUTION CENTER SITE IN EASTVALE RIVERSIDE COUNTY, CALIFORNIA

Prepared for

Alden Environmental, Inc
3245 University Ave., #1188
San Diego, CA 92104

Prepared by

Kendall H. Osborne
Osborne Biological Consulting
6675 Avenue Juan Diaz
Riverside, CA 92509

The undersigned certify this report to be a complete and accurate account of the findings and conclusions of a first year, 2017 focused survey for Delhi Sands Flower-loving Fly (*Rhaphiomidas terminatus abdominalis*) on the 15.5-acre South Milliken Distribution Center site, Eastvale, Riverside County, California.

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October 18, 2017

SUMMARY

Alden Environmental, Inc. has requested a first year focused survey to assess the presence or absence of Delhi Sands Flower-Loving Fly (DSF, *Rhaphiomidas terminatus abdominalis*) on a 15.5-acre site in Eastvale, Riverside, California. To determine presence or absence of DSF on the site, a series of 24 field visits, totaling 30 hours, were conducted on the site from July 1 to September 20, 2017.

Delhi Sands Flower-Loving Fly was not observed on the site during the course of this first year 2017 field season. No special status plant or animal species (species of concern) were encountered in the course of this survey.

1.0 INTRODUCTION

This report presents the methods and results of a Delhi Sands Flower-Loving Fly (DSF, *Rhaphiomidas terminatus abdominalis***)** focused survey for a 15.5-acre site, APN 156-030-001, and -002, located on the northeastern intersection of S. Milliken Avenue and Hwy 60, in Eastvale, Riverside County. The DSF was listed as an endangered species by the U.S. Fish and Wildlife Service on September 23, 1993 (USFWS 1993). The survey site is located on the Guaste, California USGS 7.5-minute quadrangle map, Township 2 South, Range 6 West, in the southwestern portion of Section 6 (Figures 1 and 2).

2.0 NATURAL HISTORY OF THE DELHI SANDS FLOWER-LOVING FLY

Delhi Sands Flower-loving fly belongs to a genus of flies (*Rhaphiomidas*) commonly known as flower loving flies. There are more than 30 species of these flies, distributed across the southwestern United States and northern Mexico. These flies are huge by the standards set by most flies – with size among the species ranging from approximately 1.5 centimeters up to 3, and even 4 centimeters, usually gray, tan, rust or yellow in color. All species of *Rhaphiomidas* are associated with rather arid, sandy habitats, with most species living on dune systems of inland desert valleys, rivers, deltas, and beach strands. A few species are found in sandy washes, alluvial benches and remnant glacial moraines. Many species of these flies often hover before flowers in the manner of hummingbirds, using a long, thin, tubular proboscis (mouth-part), with which the flies probe for nectar – hence a traditional name “giant flower-loving flies”. Smaller flies of the family Apioceridae, once considered very closely related to *Rhaphiomidas* were formerly called “flower-loving flies”.

The DSF is only known to occur in association with Delhi sand deposits, presumably occupied the once extensive dune system of the upper Santa Ana River Valley, including portions of what is now the City of Colton, west through portions of the City of Ontario, and south to the Santa Ana River. Today, DSF exists on only a few disjunct sites (USFWS 1997) within a radius of about eight miles in southwestern San Bernardino and northwestern Riverside Counties (Colton, Rialto, Fontana, and Ontario). More than 95 percent of known DSF habitat was considered eliminated by development, agriculture and other land management practices by 1993 (Smith 1993, USFWS 1996 *in* Kingsley 1996), however, this proportion is now nearer 98 to 99% due to these ongoing

processes. Many of the last remaining fragments of DSF habitat are currently under pressure by land management efforts such as heavy disking, irrigation, manure dumping, and gravel dumping. There is presently an estimated 1,200 acres of habitat that can support this species (USFWS 1997), but this estimate likely includes lands needing extensive habitat restoration.

Adult DSF flight period is typically August and September, when individual adults emerge, reproduce and die. The adult life span of an individual DSF lasts for a few days and adults do not live beyond the flight period (Kiyani 1995). Adult DSF are highly mobile, agile fliers. Male DSF are frequently seen flying low through habitat, using apparently random, circuitous paths around and between shrubs in search of females. Such "cruising" behavior often covers areas on the scale of 1000 square meters in the time span of a minute. Alternatively, male DSF are often seen flying about an open patch of ground (ca 100 square meters) such as along a dirt path or dune blow-out area. Here, males may repetitively land and rest on one or another object (such as small dried plants) in the area, and such rests are interrupted by periods of patrolling flight (apparently territorial) about the spot. When alarmed, these insects tend to fly rapidly in more or less a straight line – often covering distances of 100 meters in less than 6 seconds. Adult DSF are known to nectar at flowers of California buckwheat and California croton.

DSF, like other *Rhaphiomidas* species, appears to have an annual life cycle (because of the annual flight). However, it has been widely believed that the underground larval/pupal stage may persist for additional years, depending upon various environmental factors such as annual rainfall, food availability and weather conditions during the flight season (many desert *Rhaphiomidas* species do not appear after a drought year and often, substantial flights occur only sporadically over the years). The biology of *Rhaphiomidas trochilus* is likely informative of *Rhaphiomidas* species in general and DSF in particular. Based on observations of captive *R. trochilus* larvae (Osborne and Ballmer 2014) it is reasonable to conclude that they are mobile opportunistic predators of soft-bodied, sand-inhabiting insects. Larvae from Sand Ridge, Kern County, CA were maintained in captivity for several months, during which they burrowed actively through sand maintained with slight moisture content (similar to the damp sand where they were found). They fed on larvae of a scarab beetle (Scarabaeidae) and an unidentified beefly (Diptera: Bombyliidae), which were also recovered from Sand Ridge, and larvae of paper wasps (*Polistes* sp.) which were removed from their nests and buried in the sand. Captive larvae grew and molted after feeding; but, when not fed for extended periods of time, they molted again – losing weight and size in the process. Some larvae were observed to repeat the growth and "shrinkage" cycle multiple times. One larva survived about 17 months in captivity; because it was captured nine months after the most recent flight season, it was at least two years old at time of death. This larva molted four times while undergoing five cycles of growth and shrinkage driven by variable food availability. Its final dry weight was slightly smaller than the typical dry weight of an adult male *R. trochilus*. The ability of *R. trochilus* larvae to molt down during times of scarce food resources could allow an extended and indeterminate larval growth period, but with maturation and appearance of adults always during summer months. This may also explain the common observations that populations of various *Rhaphiomidas* species apparently exhibit little or no adult emergence in some years (especially years of below normal precipitation).

The brief adult life span and active mate-locating behavior of DSF males (typical of all *Rhaphiomidas* species) suggests that relatively high population density and/or nearly synchronous adult emergence may be crucial to survival of populations. Protracted *Rhaphiomidas* larval biology and staggered (across years) adult emergence must enhance population momentum and cross generational gene flow, and the requirement of abundant and diverse insect prey on which larvae develop – all explain why DSF populations appear as long-term entities (persisting for decades) associated with ecologically intact dune habitats.

3.0 METHODOLOGY

3.1 DSF Survey Guidelines

Interim General Survey Guidelines for the DSF have been suggested by the USFWS (1996). By following these guidelines, DSF presence or absence survey results may be deemed acceptable to the USFWS (rejection of survey results may result where the guidelines are not followed). The guidelines indicate that focused DSF surveys should be conducted wherever Delhi sands are present within the presumed range of DSF, twice weekly (two days per week) during the single annual flight period (usually from July 1 to September 20). Recent early season DSF discoveries lead the USFWS to recommend a survey season from July 15 to September 20 for 2003 and a survey season from July 1 to September 20 from the year 2004. Weather conditions must be suitable for DSF activity at the times survey work is pursued. The DSF is generally active when daytime temperatures exceed 80 degrees Fahrenheit (°F), but may fly with slightly cooler temperatures in bright sunlight.

3.2 Habitat Assessment Methods

On June 6, 2017, Osborne visited the study site in order to investigate habitat suitability for the DSF. Osborne reviewed soil maps and aerial imagery covering the subject site, prepared by the California Department of Agriculture (Knecht 1971, Woodruff 1980), this data additionally presented through the U. C. Davis Soil Resource website (http://casoilresource.lawr.ucdavis.edu/gmap/). Satellite imagery covering the site, dating from 1994 to 2016 (Google Earth), and additional historic aerial images covering the site back to 1935, were reviewed in order to gain further understanding (beyond my own casual observations over the last two decades) of land use regimens in recent years. Photographs were taken of the site along with field notes on vegetation and soil conditions. The subject site was examined to rate its potential to support DSF, the rating (Osborne 2003, Osborne et al 2003) based on the following scale of 1 to 5, with 5 being the best quality and most suitable habitat based on the following scheme:

1. Developed areas, non-Delhi sands soils with high clay, silt, and/or gravel content. Delhi sands extensively and deeply covered by dumping of exotic soils, rubble, trash, manure, or organic debris. *Unsuitable.*

2. Delhi sands are present but the soil characteristics include a predominance of exotic soils such as alluvial materials, or predominance of other foreign contamination as gravels, manure, or organic debris. Severe and frequent disturbance (such as a maintenance yard

or high use roadbed). *Very Low Quality.*

3. Moderately contaminated Delhi sands. Delhi sands with moderate to high disturbance (such as annual disking). Sufficient Delhi Sands are present to prevent soil compaction (related to contamination by foreign soils). Some sandy soils exposed on the surface due to fossorial animal activity. *Low Quality.*

4. Abundant clean Delhi Sands with little or no foreign soils (such as alluvial material) present. Moderate abundance of exposed sands on the soil surface. Low vegetative cover. Evidence of moderate degree of fossorial animal activity by vertebrates and invertebrates. May represent high quality habitat with mild or superficial disturbance. *Moderate Quality*

5. Sand dune habitat with clean Delhi Sands. High abundance of exposed sands on the soil surface. Low vegetative cover. Evidence (soil surface often gives under foot) of high degree of fossorial animal activity by vertebrates and invertebrates. Sand associated plant and arthropod species may be abundant. *High Quality*

It should be noted that habitat qualities often vary spatially within a site so that conditions on a site fall within a range of qualities. Further, overall habitat quality is affected by the overall habitat area on a site, such that very small areas diminish the overall habitat value of a site. Use of this habitat rating system is somewhat subjective and best undertaken by a biologist who has extensive experience with *Rhaphiomidas* species. While investigating the subject site, Osborne subjected the site to an analysis of this kind so as to give a general estimate of overall habitat conditions relevant to DSF potential. This rating scheme was originally develop so as to contribute an objective means of determining mitigation rates for sites found to support the DSF, however, these ratings are helpful toward informing generally habitat conditions.

3.3 Focused Survey Methods

The subject site was surveyed on 24 dates, totaling at least 30 field hours, with site visits made from July 1, to September 20, 2017. Focused DSF surveys were conducted by Kendall H. Osborne, Permit # TE-837760-10, Dr. Jeremiah George (under Osborne's permit), Rick Rogers # TE-844465-1, David K. Faulkner # TE-838743-6, and Eric S. Renfro # TE-142436-2, a team which incidentally boasts a combined 243 years of entomological experience. Following the USFWS Interim General Survey Guidelines, we surveyed all portions of the subject site at least twice a week, between the hours of 1000 and 1400 (Table 1). The survey protocol, as set forth in the Interim General Guidelines for the Delhi Sands flower-loving fly survey, is designed to maximize the validity of a presence/absence determination.

Osborne photographed the property from several perspectives to document existing conditions. Notes were taken on vegetative cover and plant species composition, abundance and diversity and species composition of insects and other animals, soil types, degree and nature of disturbance, surface cover, organic content, compaction, current land management practices, existing development, and conditions of surrounding vicinity and proximity of other DSF populations.

Table 1. Dates, personnel, times and conditions for focused DSF survey work (2017).

Date	Biologist	Hours	Weather Conditions
7/1/2017	D. Faulkner	1015-1130	0-50% patchy clouds, 0-4 mph, 72-74° *F*.
7/5/2017	R. Rogers	1115-1230	0-5% clouds, clear, 1-5 mph, 86-93° *F*.
7/10/2017	R. Rogers	1110-1225	clear, winds 1-4 mph, 99-101° *F*.
7/12/2017	E. Renfro	1106-1221	clear, winds 2 mph, 85-88° *F*.
7/18/2017	E. Renfro	1122-1237	clear, winds 2-5 mph, 86-91° *F*.
7/21/2017	D. Faulkner	1040-1155	haze/clear, winds 0-1 mph, 86-89° *F*.
7/23/2017	E. Renfro	1135-1250	clear, winds 2-3 mph, 90-91° *F*.
7/25/2017	K. Osborne	1148-1303	30-50% patchy clouds, winds 0-5 mph, 85-90° *F*.
7/30/2017	R. Rogers	1036-1151	clear, winds 1-7 mph, 93-94° *F*.
8/2/2017	D. Faulkner	1040-1155	95-100% overcast, winds 0-1 mph, 86-91° *F*.
8/5/2017	E. Renfro	1141-1251	clear, winds 1-2 mph, 87-91° *F*.
8/8/2017	R. Rogers	1110-1225	clear, winds 0-3 mph, 90-97° *F*.
8/12/2017	D. Faulkner	1040-1155	haze, clear, winds 2-3 mph, 80-82° *F*.
8/16/2017	K. Osborne	1014-1129	10% clouds, clear, winds 0-2 mph, 75-83° *F*.
8/20/2017	D. Faulkner	1040-1155	haze, clear, 0-1 mph, 78-81° *F*.
8/25/2017	J. George	1125-1240	5-10% clouds, winds 8-10 mph, 83-85° *F*.
8/30/2017	K. Osborne	1020-1135	clear, winds 0-2 mph, 101-103° *F*.
9/1/2017	D. Faulkner	1040-1155	clear, winds 0-7 mph, 100-107° *F*.
9/4/2017	R. Rogers	1046-1201	10% patchy clouds, winds 1-8 mph, 92-94° *F*.
9/8/2017	D. Faulkner	1040-1155	clear, winds 0-1 mph, 81-82° *F*.
9/10/2017	K. Osborne	1039-1154	clear, winds 0-3 mph, 90-94° *F*.
9/13/2017	R. Rogers	1120-1235	clear, winds 2-5 mph, 80-89° *F*.
9/16/2017	K. Osborne	1042-1157	99- 30% overcast to patchy clouds winds 0-7 mph, 75-83° *F*.
9/20/2017	R. Rogers	1120-1235	overcast, calm, 76° *F*.

4.0 RESULTS

4.1 Habitat Assessment Results

Department of Agriculture, Soil Conservation Service maps (Knecht 1971, Woodruff 1980) indicate Delhi sands soils on the majority of the site, with a small inclusion of Gorgonio loamy sand on a southern central portion of the site. However, field observations determined that Delhi sand soils extend over the entire site and soil differences are not apparent across the site. The western portion of the site remains in viticulture (Figure 3). Plant species normally associated with Delhi sands ecosystems, including *Ambrosia acanthicarpa*, *Heterotheca grandiflora*, and *Camissonia bistorta* (Figure 6) occur on the site. A history of disking has likely mixed Delhi sands with loamy sands so that sands are more generally distributed than might have otherwise been the case under undisturbed conditions. The site was disked shortly prior to Osborne's site evaluation of June 6. Disking of the site condensed again on July 21, and although such disking may be standard land management in viticulture, we advised the client of the impropriety of disking a site during biological studies and the disking was immediately halted. Sand associated

insects including especially sand digging wasps (*Bembix*) and the robber fly, *Stenopogon lomae* were observed widely over the site. Another important indicator of DSF habitat quality, the Apiocerid fly *Apiocera converges* was found in abundance during the summer survey season. The DSF has been documented on lands within one kilometer (and beyond), with examples being approximately 0.6 km WNW to 0.27 km NNW of the subject site, and one observation 3.6 km ENE of the subject site. All of these DSF observations are over a decade old. Given habitat quality, the site rates as High Quality habitat potential for the DSF and focused surveys were deemed warranted.

4.2 Survey Results

Delhi Sands Flower-Loving Fly (DSF, *Rhaphiomidas terminatus abdominalis*) was not observed on the subject site during the course of this survey. Lists of plants and insects observed during the course of the survey are given in the appendix.

4.3 Existing Environment and Community

4.3.1 Adjacent lands

The survey area generally surrounded by South Milliken Avenue and commercial/industrial development to the west, Hwy 60 to the south, a developed church and parking lot to the east, and open lands of a Southern California Edison easement on the northwestern corner (with warehouse development beyond) and to the west across S. Milliken Ave. Extensive lands with Delhi sands remain south of Hwy 60, and approximately 13 acres of undeveloped land formerly supporting the DSF exist 200 meters to the north northwest of the site on the west side of S. Milliken Ave.

4.3.2 Topography

The site is generally flat, with the exception of a dune blow-out on the northeastern quarter of the site. Elevation on the site ranges approximately through 810 to 817 feet.

4.3.3 Soils

(Knecht 1971) indicated Delhi sands soils on the majority of the site, with a small inclusion of Gorgonio loamy sand on a southern central portion of the site, though a history of disking has distributed the aeolian sands throughout the site.

4.3.4 Vegetation

The survey area is generally characterized as disturbed open sands on flat to gently rolling landscape with the western half of the site in active viticulture (*Vitis vinifera*). Throughout the site, golden crownbeard (*Verbesina encelioides*), shortpod mustard (*Hirshfeldia incana*), and tumbleweed (*Salsola tragus*) are summer dominants.

Figures 3-6 present representative views of the survey site and habitats. Figure 7 provides a key as to where on the site these photographs were taken. Table 1 (Appendix A) provides a list of plant species encountered on the survey site. No special status plant species (species of concern) were encountered in the course of this survey.

4.3.5 Insect Community

During site visits at least 103 insect species (counting primarily large and conspicuous insects) were observed. A list of most insect species observed is presented in the appendix (Table 2, Appendix A). No special status animal species (species of concern) were encountered in the course of this survey.

5.0 CONCLUSIONS

Our single season of surveys for DSF can not provide definitive conclusions as to DSF presence on this site. Conditions on the site are suitable for the DSF. Although DSF was not found in the course of this season, USFWS protocol requires a second consecutive season with negative results before a site is deemed not to support a population of DSF. In going forward with project development, it is important to understand that after two years with negative survey results for DSF, if the site is not developed during the interim months before the next subsequent DSF flight season, the DSF status as absent lapses and the USFWS then recommends continued DSF surveys in order to maintain current assessments as to presence or absence.

6.0 REFERENCES

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7.0 FIGURES

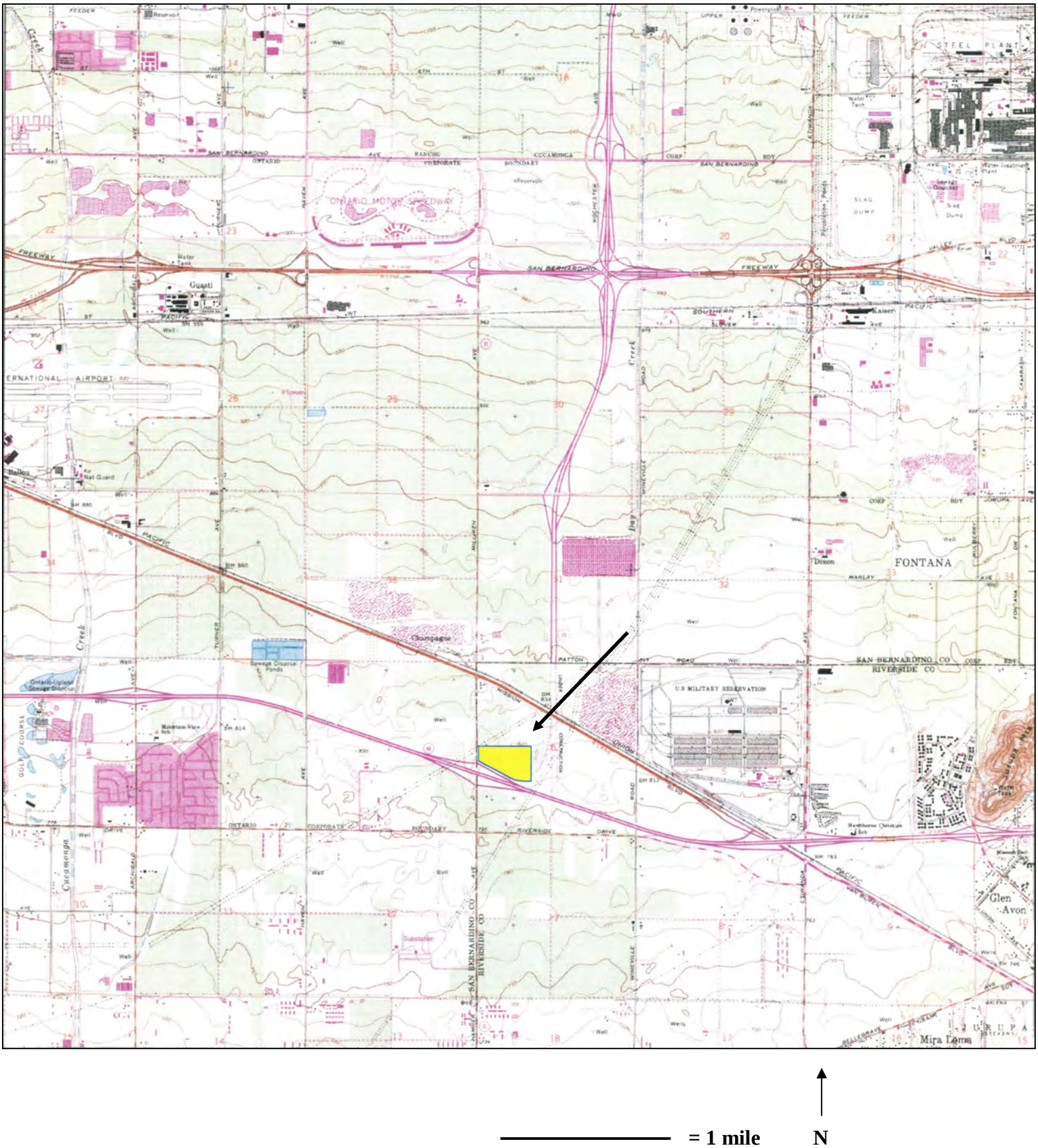


Figure 1. General vicinity of survey site, Guaste, California USGS 7.5" quadrangle at 50%. 15.5-acre site is outlined in blue and highlighted in yellow (arrow).

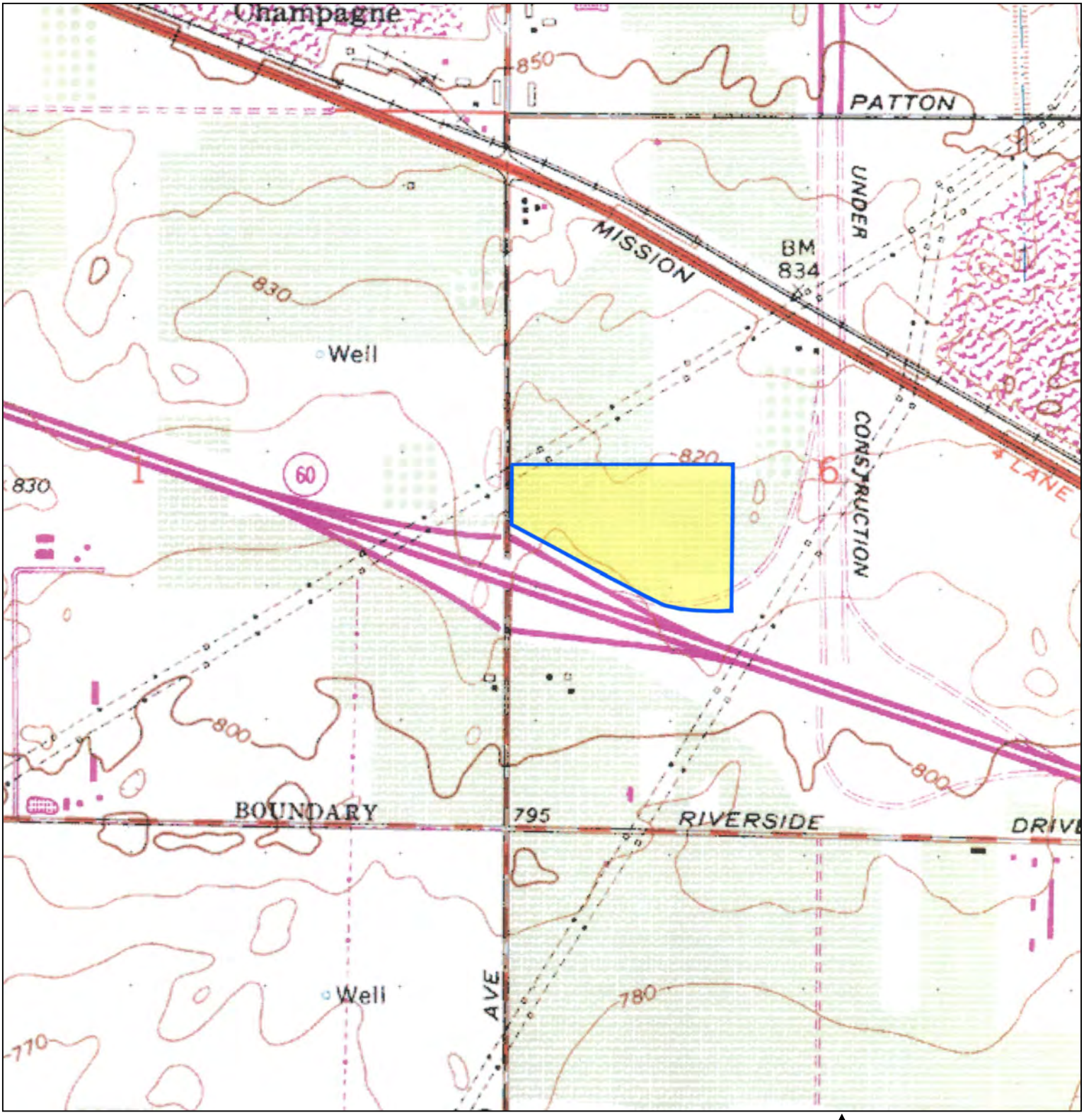


Figure 2. General vicinity of survey site, Guaste, California USGS 7.5" quadrangle at 200%. 15.5-acre site is outlined in blue and highlighted in yellow.

Figure 3. Photograph of the western survey site, looking to the southeast from the northwestern portion of the site. This view shows viticultural conditions that predominate over the western half of the site.

Figure 4. Photograph of the view across the southern portion of the site. This view looks to the southeast from a western portion of the site. At left center, grape vines are intermixed with *Hirschfeldia* and *Verbesinia.*

Figure 5. Photograph of the view across the eastern portion of the site without viticulture. This view looks to the west northwest. Disked open sands are interspersed with *Hirschfeldia* , *Verbesinia,* and *Ambrosia.*

Figure 6 Photograph of a northeastern portion of the site as seen from near the northeastern corner of the site (wall at right is the north boundary of the site). Here, open sands support *Hirschfeldia* , *Verbesinia,* and *Ambrosia*.on open disked sands.

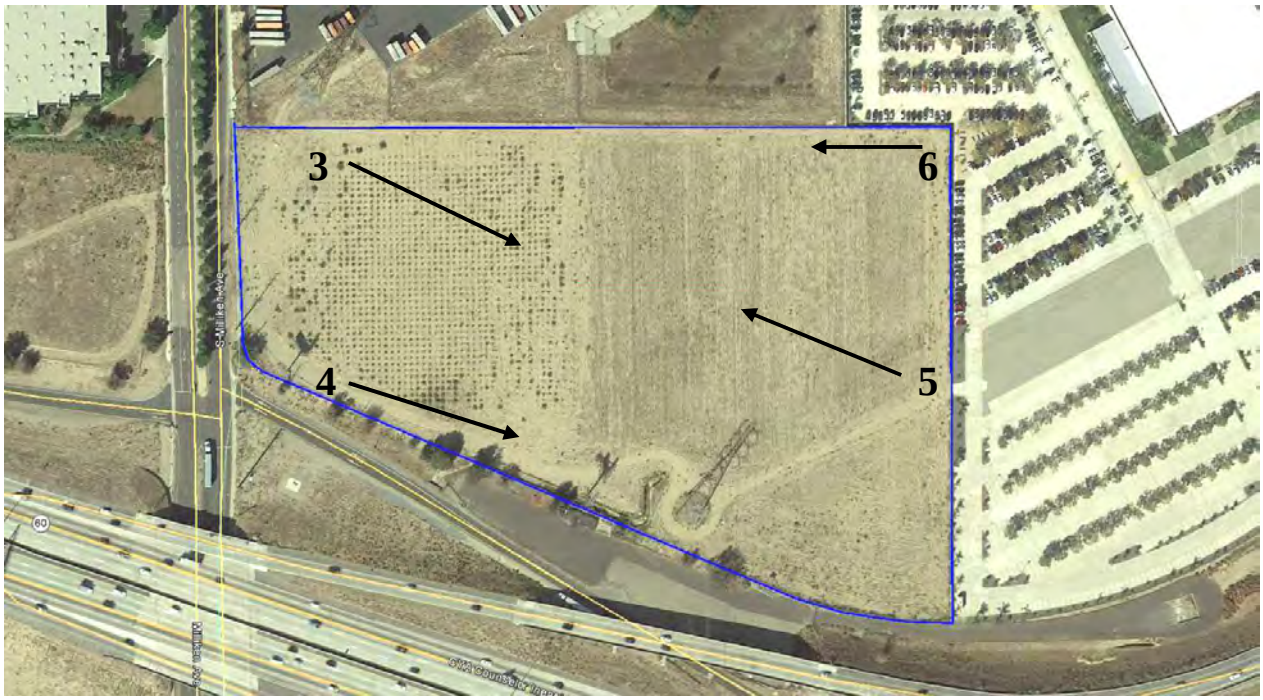


Figure 7. Approximate locations around survey site from which photographs were taken (base of arrows). Arrow indicates the direction a photograph was taken. Numbers next to the arrows indicate figure numbers (Figures 3-6).

8.0 APPENDIX

Appendix A

Table A1. Plant species encountered on the survey site,

FAMILY and COMMON NAME	Species
AMARANTHACEAE	
tumbleweed	*Amaranthus albus*
ASTERACEAE	
Western ragweed	*Ambrosia acanthicarpa*
horseweed	*Conyza canadensis*
telegraphweed	*Heterotheca grandiflora*
golden crownbeard	*Verbesina encelioides*
BORAGINACEAE	
ranchers fiddleneck	*Amsinkia intermedia*
BRASSICACEAE	
shortpod mustard	*Hirschfeldia incana*
London rocket	*Sisymbrium irio*
CHENOPODIACEAE	
Russian thistle	*Salsola tragus*
EUPHORBIACEAE	
California croton	*Croton californicus*
FABACEAE	
Spanish clover	*Lotus purshianus*
ONAGRACEAE	
California suncup	*Camissonia bistorta*
SOLANACEAE	
Jimson weed	*Datura wrightii*
VITACEAE	
Grape	*Vitis vinifera*
ZYGOPHYLLACEAE	
Puncture vine	*Tribulus terrestris*
POACEAE	
ripgut brome	*Bromus diandrus*
Common barley	*Hordium vulgare*
Shismus	*Schismus barbatus*

Table A2. Insects encountered on the survey site.

Order	Family	*Genus, species*
Diptera	Mydidae	*Nemomydas pantherinus*
	Apioceridae	*Apiocera convergens*
Diptera	Asilidae	*Efferia albibarbis*
		Mallophora fautrix
Diptera	Asilidae	*Saropogon luteus*
		Stenopogon brevisculus
Diptera	Asilidae	*Stenopogon lomae*
	Bombyliidae	*Hemipenthes*
Diptera	Bombyliidae	*Heterostylum robustum*
		Ligyra gazophylax
Diptera	Bombyliidae	*Neodiplocampta mira*
		Poecilognathus
Diptera	Bombyliidae	*Rynchanthrax caprea*
		Thyridanthrax atratus
Diptera	Bombyliidae	*Villa lateralis*
		Villa moliter
Diptera	Syrphidae	*Copostylum mexicana*
		Eristalis tenax
Diptera	Syrphidae	*Eristilis arbostrum*
		Eristilis latifrons
Diptera	Syrphidae	*Eristilis stipator*
		Eristlis aenea
Diptera	Calliphoridae	*Chrysomya*
		Phaenicia sericata
Diptera	Muscidae	*Musca domestica*
	Sarcophagidae	*Sarcophaga sp*
Diptera	Tachinidae	*Cylindromyia*
		Nemorilla pyste
Diptera	Ottidae	*undetermined*
Hymenoptera	Apidae	*Anthophora urbana*
Hymenoptera	Apidae	*Apis mellifera*
		Bombus vosnenskii
Hymenoptera	Apidae	*Nomada*
	Halictidae	*Agapostemon texana*
Hymenoptera	Halictidae	*Lasioglossum*
		Megachile
Hymenoptera	Formicidae	*Pogonomyrmex californicus*

	Crabronidae	*Bembix comata*
Hymenoptera	Crabronidae	*Bicyrtes ventralis*
		Cerceris femurrubrum
Hymenoptera	Crabronidae	*Hapalomellinus albitomentosus*
		Oxybelus uniglumis
Hymenoptera	Crabronidae	*Philanthus multimaculatus*
	Sphecidae	*Ammophila azteca*
Hymenoptera	Sphecidae	*Chalybion californicum*
	Vespidae	*Euodynerus annulatum*
Hymenoptera	Vespidae	*Polistes apachus*
		Polistes dorsalis
Hymenoptera	Vespidae	*Polistes exclamens*
		Vespula
Hymenoptera	Scoliidae	*Campsomeris tolteca*
	Mutilidae	*Dasymutilla clydenetra*
Hymenoptera	Pompilidae	*Episyron*
	Pompilidae	*Pepsis mildei*
Coleoptera	Chrysomelidae	*Apleurus albitonotosus*
		Lema trilineata
Coleoptera	Coccinellidae	*Coccinella septempunctata*
		Hippodamia convergens
Coleoptera	Scarabaeidae	*Cotinus mutabilis*
Neuroptera	Mymerliontidae	*Brachynemurus*
Lepidoptera	Arctiidae	*Estigmene acrea*
	Noctuidae	*Schinia sexplagiata*
Lepidoptera	Gelechiidae	*undetermined*
	Danaidae	*Danaus plexippus*
Lepidoptera	Hesperiidae	*Hylephila phyleus*
		Pyrgus albescens
Lepidoptera	Lycaenidae	*Brephidium exilis*
		Leptotes marina
Lepidoptera	Lycaenidae	*Plebejus acmon*
		Strymon melinus
Lepidoptera	Nymphalidae	*Agraulis vanillae*
		Junonia coenia
Lepidoptera	Nymphalidae	*Vanessa cardui*
	Papilionidae	*Papilio rumiko*
Lepidoptera	Pieridae	*Colias eurytheme*
		Phoebis senna
Lepidoptera	Pieridae	*Pieris rapae*

		Pontia protodice
Hemiptera (Heteroptera)	Pentatomidae	*Bagrada hilaris*
		Chlorochroa sayi
Hemiptera (Heteroptera)	Scutelleridae	*Euptychodera corrugata*
	Reduviidae	*Sinea diadema*
Hemiptera (Heteroptera)	Reduviidae	*Zelus renardii*
	Reduviidae	*Zelus tetricanthus*
Hemiptera (Heteroptera)	Largidae	*Largus*
Hemiptera (Auchenorrhyncha)	Cicadellidae	*Homalodisca lacerta*
Hemiptera (Auchenorrhyncha)	Cicadellidae	*undetermined*
Orthoptera	Acrididae	*Derotmema saussuraenum*
Orthoptera	Acrididae	*Melanoplus*
		Schistocerca nitens
Orthoptera	Acrididae	*Trimerotropis californica*
		Trimerotropis pallidipennis
Mantodea	Mantidae	*Iris oratoria*
Odonoata	Coenagrionidae	*Argia vivida*
Odonoata	Aeshnidae	*Aeshna multicolor*
	Aeshnidae	*Anax junius*
Odonoata	Libellulidae	*Pantala flavescens*
		Pantala hymenaea
Odonoata	Libellulidae	*Perithemis intensa*
		Sympetrum corruptum
Odonoata	Libellulidae	*Tramea lacerata*
		Tramea onusta

Appendix B

Correspondence with USFWS
Field Notes

Ken H. Osborne (permit #TE837760-10)
Osborne Biological Consulting
6675 Avenue Juan Diaz
Riverside, CA 92509
(951) 360-6461
Euproserpinus@msn.com

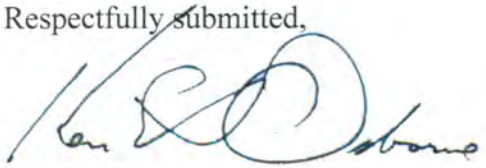
June 21, 2017

Attn: Ms. Stacey Love,
USFWS Carlsbad Field Office
2177 Salk Avenue, Suite 250
Carlsbad, CA 92008

RE: Notification of protocol survey for Delhi Sands Flower-loving Fly on 15.5 acres, APN 156-030-001, and -002, on the northeastern intersection of S. Milliken Avenue and Hwy 60, Riverside County, CA.

On behalf of Alden Environmental, Inc., I write to notify you of intent to conduct a first year protocol survey for Delhi Sands Giant Flower-loving fly (DSF, *Rhaphiomidas terminatus abdminalis*) on a 15.5-acre site, APN 156-030-001, and -002, located on the northeastern intersection of S. Milliken Avenue and Hwy 60, Riverside County, CA. Here I provide satellite maps of the site. I will be preparing maps on USGS Topographic quadrangles in the near future and will provide that as furtherance to this notification.

Respectfully submitted,



Ken H. Osborne

Cc: Mr. Greg Mason (Alden Environmental, Inc.)

Satellite image (Google Earth) with vicinity of the subject site (outlined in blue).

Survey site and immediate proximity.

Date 6/6/2017 Time 1128 to 1240 Job Alden Blvd.
Miles 6012 Location NE intersection S. Millikan/Hwy 60
Biologists KHO
Survey for: —
Habitat Assessment for: DSF

Weather: Temp ~ Wind 0 Cloud cover 0 Rain 0

Biological elements:

Vegetative communities:
West half in Viticulture. E half - fallow

Soil type Delhi sand.

Plant species:
Ambrosia, Heliotropium, Camissonia, Datura, Chenopodium

Vertebrates

Arthropods Bembix, Stenopogon larvae, Pogonomyrmex

Oak Woodlands____ Riparian Veg______ type______
Vernal Pools________

Comments:
High quality DSF habitat on clean sands.

Delhi sands flower-loving fly – General Field Form

Date 1 July 2017 Overall Time 75min Job ALDEN

Surveyor DAVID K. FAULKNER Survey Partner(s) —

Mileage 191926

Weather:

Time (24 hr)	% Cloud	Sky	Winds (mph)	Temp (F)
Start 1015	50%	clear (patchy) overcast drizzle shower	0-1	72°
		clear patchy overcast drizzle shower		
		clear patchy overcast drizzle shower		
Stop 1130	clear/haze	(clear) patchy overcast drizzle shower	3-4	74°

Biological elements:

Rhaphiomidas terminatus ? _____ time _____ sex _____ numbers ____.

Other arthropods (general) Bombyliids ✓ Asilids ✓

Mydids _____ Apiocerids _____ Sphecids _____

Pompillids _____ Scoliids _____ Chrysidids _____

Other insects of note S. melinus, P. pratorica, A. mellifera, Syrphidae, Tachinidae, Pogonomyrmex, Sharpshooter.

Plants: *Croton* _____ Telegraph weed ✓ *Eriogonum fasciculatum* ___

Eriogonum thurberi _____ other *Eriogonum* _____ *Oenothera* ____

Camissonia _____ *Eriastrum* _____

Others: Composites

Vertebrates: Ground squirrels, Mockingbird, Morning dove, Lizards.

Comments:

Delhi sands flower-loving fly – General Field Form

Date July 5, 2017 Overall Time 1 hr. 15 min. Job Alden

Surveyor Rick Rogers Survey Partner(s) 0

Mileage 29795

Weather:

Time (24 hr)	% Cloud	Sky	Winds (mph)	Temp (F)
Start 11:15	5	clear (patchy) overcast drizzle shower	1-4	86
12:00	5	clear (patchy) overcast drizzle shower	1-3	88
12:15	0	(clear) patchy overcast drizzle shower	2-5	90
Stop 12:30	0	(clear) patchy overcast drizzle shower	1-2	93

Biological elements:

Rhaphiomidas terminatus ? ____ time ____ sex ____ numbers ____.

Other arthropods (general) Bombyliids ✓ Asilids ✓

Mydids ____ Apiocerids ____ Sphecids ✓

Pompillids ____ Scoliids ____ Chrysidids ____

Other insects of note Pieris protodice, Homolodisa lacerta, Efferia albibarbis, Trimerotropis californicus, Hoplomelinus albitomentosa, Brachymeyrmeleo sp. (lg.), Lasioglossum sp., Plebejus acmon, Philanthus multimaculata, Mallophora fautrix, Neodiplocampta mira, Strymon melinus, Apleurus sp.

Vertebrates:

Comments:

Delhi sands flower-loving fly – General Field Form

Date July 10, 2017 Overall Time 1 hr. 15 min. Job Alden

Surveyor Rick Rogers Survey Partner(s) 0

Mileage 44328

Weather:

Time (24 hr)	% Cloud	Sky	Winds (mph)	Temp (F)
Start 11:10	0	(clear) patchy overcast drizzle shower	1–4	101
11:45	0	(clear) patchy overcast drizzle shower	1–3	99
12:00	0	(clear) patchy overcast drizzle shower	1–2	100
Stop 12:25	0	(clear) patchy overcast drizzle shower	1–3	101

Biological elements:

Rhaphiomidas terminatus ? ____ time ____ sex ____ numbers ____.

Other arthropods (general) Bombyliids ✓ Asilids ✓

Mydids ✓ Apiocerids ____ Sphecids ✓

Pompillids ____ Scoliids ____ Chrysidids ____

Other insects of note Pieris protodice, Nomada sp. Homoplodisca zelus sp., Brachymyrmelon sp. (lg.) B. exilis, Plebejus acmon, Strymon melinus, Efferia albibarbis, Trimerotropis palidipennis, Sarcophaga sp. (lg.) Cercopidae (x. small-striped "face") Chlorochlora sayi, Sinea sp., Melitta californica, Philanthus multimacula, Colias eurytheme, Ammophila aztéca, Neodiplocampta mira, Nemomydas pantherinus,

Vertebrates:

Comments:

Delhi sands flower-loving fly – General Field Form

Date 7/12/2017 Overall Time ~~_____~~ Job Alden

Surveyor Eric Renfro Survey Partner(s) N/A

Mileage _____

Weather:

Time (24 hr)	% Cloud	Sky	Winds (mph)	Temp (F)
11:05 ~~Start 10:15~~	0	clear patchy overcast drizzle shower	~~1~~ 1	~~83~~ 85
		clear patchy overcast drizzle shower		
		~~clear~~ patchy overcast drizzle shower		
12:20 ~~Stop 11:30~~	0	clear patchy overcast drizzle shower	2	88

Biological elements:

Rhaphiomidas terminatus ? N/A time N/A sex _____ numbers _____.

Other arthropods (general) Bombyliids _____ Asilids ✓

Mydids ✓ Apiocerids _____ Sphecids ✓

Pompillids ✓ Scoliids _____ Chrysidids _____

Other insects of note Nemomidas, Ammophila, Chalybion californicus

Plants: *Croton* _____ Telegraph weed _____ *Eriogonum fasciculatum* _____

Eriogonum thurberi _____ other *Eriogonum* _____ *Oenothera* _____

Camissonia _____ *Eriastrum* _____

Others: _____

Vertebrates: _____

Comments: Dunes / Grapes

Delhi sands flower-loving fly – General Field Form

Date 7/18/2017 Overall Time 11:22 - 12:37 Job Alden

Surveyor Eric Rentso Survey Partner(s) N/A

Mileage _____

Weather:

Time (24 hr)	% Cloud	Sky	Winds (mph)	Temp (F)
Start 11:22	0	(clear) patchy overcast drizzle shower	2-3	86
		clear patchy overcast drizzle shower		
		clear patchy overcast drizzle shower		
Stop 12:37	0	(clear) patchy overcast drizzle shower	2-3 → 3-4	91

Biological elements:

Rhaphiomidas terminatus ? ____ time ____ sex N/A numbers ____.

Other arthropods (general) Bombyliids ____ Asilids ✓

Mydids ____ Apiocerids ____ Sphecids ✓

Pompillids ____ Scoliids ____ Chrysidids ____

Other insects of note Mallophora sp. Eristalis tenax Bombyx comata

Plants: *Croton* ____ Telegraph weed ____ *Eriogonum fasciculatum* ____

Eriogonum thurberi ____ other *Eriogonum* ____ *Oenothera* ____

Camissonia ____ *Eriastrum* ____

Others: ____

Vertebrates: ____

Comments:

Delhi sands flower-loving fly – General Field Form

Date 21 July 2017 Overall Time 1 hr. 15 min Job ALDEN

Surveyor DAVID K. FAULKNER Survey Partner(s) ∅

Mileage (194239)

Weather:

Time (24 hr)	% Cloud	Sky	Winds (mph)	Temp (F)
Start 1040	∅ HAZE	(clear) patchy overcast drizzle shower	0-1	86°
		clear patchy overcast drizzle shower		
		clear patchy overcast drizzle shower		
Stop 1155	∅ HAZE	(clear) patchy overcast drizzle shower	0-1	89°

Biological elements:

Rhaphiomidas terminatus ? _____ time _____ sex _____ numbers ____.

Other arthropods (general) Bombyliids ✓ Asilids ✓
Mydids _____ Apiocerids _____ Sphecids ✓
Pompillids ✓ Scoliids _____ Chrysidids _____
Other insects of note ~~Ammophila, Asilids, Pogonomyrmex, Banking~~

Plants: *Croton* ✓ Telegraph weed ✓ (Limited) *Eriogonum fasciculatum* ____
Eriogonum thurberi _____ other *Eriogonum* _____ *Oenothera* _____
Camissonia _____ *Eriastrum* _____
Others: _____

Vertebrates: Lizards, Birds.

Comments:

Disking (?) Mowing going on Today. Called about whether or not this is allowed. Left Messages for Mario & Ken. Continued Surveys.

Delhi sands flower-loving fly – General Field Form

Date 7/23/2017 Overall Time 11:35-12:50 Job Alden

Surveyor Eric Renfro Survey Partner(s) N/A

Mileage ______

Weather:

Time (24 hr)	% Cloud	Sky	Winds (mph)	Temp (F)
Start 11:35	0	(clear) patchy overcast drizzle shower	2-3	90
		clear patchy overcast drizzle shower		
		clear patchy overcast drizzle shower		
Stop 12:50	0	(clear) patchy overcast drizzle shower	2-3	91

Biological elements:

Rhaphiomidas terminatus ? ___ time N/A sex ___ numbers ___.

Other arthropods (general) Bombyliids ___ Asilids ✓

Mydids ___ Apiocerids ___ Sphecids ✓

Pompillids ___ Scoliids ✓ Chrysidids ___

Other insects of note Myrmeleontidae sp., Bembix comata, Cerceris sp., Hemipenthes sp. Eristalis arbustorum, Ericeria albibarbis, Cotinus texana, Sharpshooter (Cicadellidae) Apidae sp., Bombus californicus

Plants: *Croton* ___ Telegraph weed ___ *Eriogonum fasciculatum* ___

Eriogonum thurberi ___ other *Eriogonum* ___ *Oenothera* ___

Camissonia ___ *Eriastrum* ___

Others: ______

Vertebrates: ______

Comments:

Delhi sands flower-loving fly – General Field Form

Date 7/25/17 Overall Time 1148- 103 Job A lden

Surveyor KHOsborne Survey Partner(s) ø

Mileage 9844

Weather:

Time (24 hr)	% Cloud	Sky	Winds (mph)	Temp (F)
Start 1148	50	clear (patchy) overcast drizzle shower	0 - 2	85 Humid
		clear patchy overcast drizzle shower		
		clear patchy overcast drizzle shower		
Stop 103	30	clear (patchy) overcast drizzle shower	0 - 5	90

Biological elements:
Rhaphiomidas terminatus ? ____ time ____ sex ____ numbers ____.

Other arthropods (general) Bombyliids ____ Asilids ✓
Mydids ✓ Apiocerids ____ Sphecids ✓
Pompillids ____ Scoliids ✓ Chrysidids ____
Other insects of note S. lomae, Bristelis, sp. Pontia Nemomydas latifrons, Cotinus, P. apachus.

Vertebrates: RBHA Grnd squirrel uta Cottontail NOMO CAKI HUOR

Comments:

Delhi sands flower-loving fly – General Field Form

Date July 30, 2017 Overall Time 1 hr. 15 min. Job Alden

Surveyor Rick Rogers Survey Partner(s) 0

Mileage 11481

Weather:

Time (24 hr)	% Cloud	Sky	Winds (mph)	Temp (F)
Start 10:35	0	(clear) patchy overcast drizzle shower	1–4	93
10:50	0	(clear) patchy overcast drizzle shower	2–7	94
11:30	0	(clear) patchy overcast drizzle shower	1–5	94
Stop 11:51	0	(clear) patchy overcast drizzle shower	1–4	94

Biological elements:

Rhaphiomidas terminatus ? ____ time ____ sex ____ numbers ____.

Other arthropods (general) Bombyliids ✓ Asilids ✓

Mydids ____ Apiocerids ____ Sphecids ✓

Pompillids ____ Scoliids ____ Chrysidids ____

Other insects of note

Cotinus, Liris sp. Therevid (white furry) Pieris protodice, Megachile sp. (sm.), Plebejus acmon, Ammophila azteca, Philanthus multimaculata, Strymon melinus, Efferia albibarbis, Trimerotropis californicus, Eristalis sp. "latifrons", Agapostemon texana, Pantala flavescens, Heterostylum robustum – New for fly survey? – large Myrmyleontid, Bembix comata, Exodyneurus sp., Oxybelus uniglumis, H. phylaeus, Haplomelitus albitomentosa, Chlorochroa sp.,

Vertebrates:

Comments:

Delhi sands flower-loving fly – General Field Form

Date 2 Aug 2017 Overall Time _____ Job ALDEN

Surveyor DAVID K. FAULKNER Survey Partner(s) Ø

Mileage _____ (195544)

Weather:

Time (24 hr)	% Cloud	Sky	Winds (mph)	Temp (F)
Start 1040	95%	clear patchy (overcast) drizzle shower	0-1	86°
		clear patchy overcast drizzle shower		
		clear patchy overcast drizzle shower		
Stop 1155	100%	clear patchy (overcast) drizzle shower	0-1	91°

Biological elements:

Rhaphiomidas terminatus ? _____ time _____ sex _____ numbers _____.

Other arthropods (general) Bombyliids ✓ Asilids _____

Mydids _____ Apiocerids _____ Sphecids ✓

Pompillids _____ Scoliids _____ Chrysidids _____

Other insects of note Monarch, S. melinus, Acmon, P. protodice, microlep (collected)
Cotinis, vespids, Ammophila, Acrid.ds, Chrysomelids, Halictids, Bombyliids (dark)
Microbombyliids, Dasyproctid (?, white)

Plants: *Croton* _____ Telegraph weed ✓ *Eriogonum fasciculatum* _____

Eriogonum thurberi _____ other *Eriogonum* _____ *Oenothera* _____

Camissonia _____ *Eriastrum* _____

Others: _____

Vertebrates: cottontails, Mockingbirds

Comments:

Delhi sands flower-loving fly – General Field Form

Date 8/5/2017 Overall Time 11:41-12:51 Job Alden

Surveyor Eric Renteria Survey Partner(s) N/A

Mileage

Weather:

Time (24 hr)	% Cloud	Sky	Winds (mph)	Temp (F)
Start 11:41	0	(clear) patchy overcast drizzle shower	1-2	87
	0	(clear) patchy overcast drizzle shower	1-2	90
		clear patchy overcast drizzle shower		
Stop ~~12:41~~ 12:51		(clear) patchy overcast drizzle shower	1-2	91

Biological elements:

Rhaphiomidas terminatus ? time N/A sex ___ numbers ___.

Other arthropods (general) Bombyliids ✓ Asilids ___
Mydids ___ Apiocerids ___ Sphecids ✓
Pompillids ___ Scoliids ___ Chrysidids ___
Other insects of note Hemipenthes sp., Villa melitor, Tramea lacerata, Polistes apathus, Vanessa cardui

Plants: *Croton* ___ Telegraph weed ___ *Eriogonum fasciculatum* ___
Eriogonum thurberi ___ other *Eriogonum* ___ *Oenothera* ___
Camissonia ___ *Eriastrum* ___
Others:

Vertebrates: flycatcher sp. (Yellow body, black wings)

Comments:

Delhi sands flower-loving fly – General Field Form

Date Aug 8, 2017 Overall Time 1 hr. 15 min. Job Alden

Surveyor Rick Rogers Survey Partner(s) 0

Mileage 44 of 90

Weather:

Time (24 hr)	% Cloud	Sky	Winds (mph)	Temp (F)
Start 11:10	0	(clear) patchy overcast drizzle shower	2–3	90
11:30	0	(clear) patchy overcast drizzle shower	1–2	95
12:00	0	(clear) patchy overcast drizzle shower	0–2	95
Stop 12:25	0	(clear) patchy overcast drizzle shower	1–3	97

Biological elements:

Rhaphiomidas terminatus ? _____ time _____ sex _____ numbers ____.

Other arthropods (general) Bombyliids _____ Asilids ✓

Mydids _____ Apiocerids _____ Sphecids ✓

Pompillids _____ Scoliids _____ Chrysidids _____

Other insects of note Philanthus multimaculata, Homoladisca, Strymon melinus, Brachymyrmelon sp., Plebejus acmon, Bombix comata, Parnassius clodius, B. exilis, Polistes apachus, H. phylaeus, Cotinus, Myrmyleon sp. (sand) Otitid (large head!) Liris sp., Colias eurytheme, Chlorochroa sp. Mallophora fructrix, Trimerotropis californicus,

Vertebrates: _____

Comments:

Delhi sands flower-loving fly – General Field Form

Date 12 Aug 2017 Overall Time ____________ Job ALDEN

Surveyor DAVID K FAULKNER Survey Partner(s) Ø

Mileage (196885)

Weather:

Time (24 hr)	% Cloud	Sky	Winds (mph)	Temp (F)
Start 1040	Ø HAZE	(clear) patchy overcast drizzle shower	2-3	80°
		clear patchy overcast drizzle shower		
		clear patchy overcast drizzle shower		
Stop 1155	Ø HAZE	(clear) patchy overcast drizzle shower	2-3	82°

Biological elements:

Rhaphiomidas terminatus ? _____time ______ sex _____ numbers ____.

Other arthropods (general) Bombyliids ✓ Asilids ✓

Mydids ______ Apiocerids __________ Sphecids ✓

Pompillids ✓ Scoliids ______________ Chrysidids __________

Other insects of note Pepsis, Vespids, Various bees, Asilid (brown), Bombyliids Dasymutilla (white ♀) Ammophila, Syrphids, small white microleps (collected) Bembix. S. melinus, Acmon, Papilio zelicaon(?) mallophora

Plants: *Croton* _____ Telegraph weed ✓ *Eriogonum fasciculatum* ___

Eriogonum thurberi ______ other *Eriogonum* ________ *Oenothera* _____

Camissonia __________ *Eriastrum* __________

Others: ______________________________

Vertebrates: Ground Squirrels

Comments:

Delhi sands flower-loving fly – General Field Form

Date 8/16/17 Overall Time 10[04] – 11[29] Job Alder

Surveyor K H Osborne Survey Partner(s) Ø

Mileage 1670.

Weather:

Time (24 hr)	% Cloud	Sky	Winds (mph)	Temp (F)
Start 10[14]	10	(clear) patchy overcast drizzle shower	0 - 2	75
		clear patchy overcast drizzle shower		
		clear patchy overcast drizzle shower		
Stop 11[29]	0	(clear) patchy overcast drizzle shower	0	83

Biological elements:

Rhaphiomidas terminatus ? _____ time ______ sex _____ numbers ____.

Other arthropods (general) Bombyliids ✓ Asilids ✓
Mydids ______ Apiocerids ✓ Sphecids ______
Pompillids ______ Scoliids ______ Chrysidids ______
Other insects of note Cotinus, V. malitae, A. convergens, Stenopogon. Nomada, Strymon, Brephidium, Pontia, Hylephila, B. acmon Pantala f.

Vertebrates: Uta

Comments:

Apiocera are abundant! (most are in undisked areas.

Delhi sands flower-loving fly – General Field Form

Date 20 Aug 2017 Overall Time _____ Job ALOEN

Surveyor DAVID K. FAULKNER Survey Partner(s) Ø

Mileage _____ (198094)

Weather:

Time (24 hr)	% Cloud	Sky	Winds (mph)	Temp (F)
Start 1040	9 HAZE	(clear) patchy overcast drizzle shower	01	78°
		clear patchy overcast drizzle shower		
		clear patchy overcast drizzle shower		
Stop 1155	Ø HAZE	(clear) patchy overcast drizzle shower	Ø	81°

Biological elements:

Rhaphiomidas terminatus ? _____ time _____ sex _____ numbers _____.

Other arthropods (general) Bombyliids ✓ Asilids ✓
Mydids _____ Apiocerids ✓ Sphecids ✓
Pompillids _____ Scoliids _____ Chrysidids _____
Other insects of note ARCTIID (LARVAE, Apiocera (pupae)
NUMEROUS P. ACMON, ASILIDS (2 SP.)
BRACHYNEMURUS (2 SP)

Plants: *Croton* ✓ Telegraph weed ✓ *Eriogonum fasciculatum* _____
Eriogonum thurberi _____ other *Eriogonum* _____ *Oenothera* _____
Camissonia _____ *Eriastrum* _____
Others: ~~ARCTI~~

Vertebrates: _____

Comments:

ARCTIIDS FEEDING ON PUNCTUROSUM.

Delhi sands flower-loving fly – General Field Form

Date 8/25/2017 Overall Time ____________ Job Alden

Surveyor Jeremiah N. George Survey Partner(s) ____________

Mileage ____________

Weather:

Time (24 hr)	% Cloud	Sky	Winds (mph)	Temp (F)
Start 1125	5-10%	clear patchy (overcast) drizzle shower	8mph	83°
1240	hazy NO Real Clouds	clear patchy overcast drizzle shower	10mph SSW	85°F
		clear patchy overcast drizzle shower		
Stop		clear patchy overcast drizzle shower		

Biological elements:

Rhaphiomidas terminatus ? NO time ______ sex _____ numbers ____.

Other arthropods (general) Bombyliids ✓ Asilids ✓
Mydids ✓ Apiocerids ✓ Sphecids ✓
Pompillids ______ Scoliids ______ Chrysidids ______
Other insects of note Mallophora, ♂ Apiocera
Artiidae larva on Vitis grape, Villa, Thyllidanthrax, Efferia
Acmon, Pesdita, Gellichid on Ambrosia, VESPULA + POLISTES
on grapes, Nemomydas 1♀, glassywing sharpshooter!
Nemomydas ♂ x1, Ligyra, Pogo Calif, Bombex, Micro bembex on North fence line.

Plants: *Croton* ✓ Telegraph weed ✓ *Eriogonum fasciculatum* ___
Eriogonum thurberi ______ other *Eriogonum* ______ *Oenothera* ______
Camissonia ✓ *Eriastrum* ______
Others: Clyptantha small, Eulobus calif., Ambrosia, Amsinkia
NOT MANY CROTON, Acmispon Glaber,

Vertebrates: UTA Ground SQ, western cottontail, COYOTE Adult
PLUS multiple Dens-

Comments:

HISTORIC VINYARD
Recently Heavily Disked
But possible LAPM Burrows!

Delhi sands flower-loving fly – General Field Form

Date 8/30/2017 Overall Time 1020 - 1135 Job Alder

Surveyor K H Osborne Survey Partner(s) ∅

Mileage 3285

Weather:

Time (24 hr)	% Cloud	Sky	Winds (mph)	Temp (F)
Start 1020	0	(clear) patchy overcast drizzle shower	0	101 Humid
		clear patchy overcast drizzle shower		
		clear patchy overcast drizzle shower		
Stop 1135	2	(clear) patchy overcast drizzle shower	0-2	103

Biological elements:

Rhaphiomidas terminatus ? ____time _____ sex ____ numbers ____.

Other arthropods (general) Bombyliids ______ Asilids ✓

Mydids _____ Apiocerids ✓ Sphecids ✓

Pompillids__________ Scoliids____________ Chrysidids _________

Other insects of note

P.c., Pontia, Cotinus, P. acmon, V. cardui, Colias,
Stenopogon, Bembix, Ammophila, Apiocera convergens,
[illegible] Hoplophila, Largid, Z. tetracanthus

Vertebrates:

Comments:

Delhi sands flower-loving fly – General Field Form

Date 1 Sept 2017 Overall Time _____ Job ALDEN

Surveyor DAVID K. FAULKNER Survey Partner(s) ∅

Mileage _____ (200050)

Weather:

Time (24 hr)	% Cloud	Sky	Winds (mph)	Temp (F)
Start 1040	∅ LIGHT HAZE	(clear) patchy overcast drizzle shower	0-1	100°F
		clear patchy overcast drizzle shower		
		clear patchy overcast drizzle shower		
Stop 1155	∅	(clear) patchy overcast drizzle shower	5-7 mph	107°

Biological elements:

Rhaphiomidas terminatus ? ____ time _____ sex _____ numbers ____.

Other arthropods (general) Bombyliids ✓ Asilids _____

Mydids ∅ Apiocerids ∅ Sphecids ✓

Pompillids _____ Scoliids _____ Chrysidids _____

Other insects of note Mostly Leps/Grasshoppers. Bombyliids (2 sp.), Bombyl ADULT/LARVAL Arctiids - caterpillars on Grapeleaves. Brachynemurus, Assassin bugs

Plants: *Croton* ✓ Telegraph weed ✓ *Eriogonum fasciculatum* ___

Eriogonum thurberi _____ other *Eriogonum* _____ *Oenothera* _____

Camissonia _____ *Eriastrum* _____

Others: Croton - one plant probably off-site.

Vertebrates: Mockingbirds, Lizards.

Comments:

LIMITED INSECT ACTIVITY

Delhi sands flower-loving fly – General Field Form

Date Sept. 4, 2017 Overall Time 1 hr. 15 min. Job Alden

Surveyor Rick Rogers Survey Partner(s) 0

Mileage 49945

Weather:

Time (24 hr)	% Cloud	Sky	Winds (mph)	Temp (F)
Start 10:46	10	clear (patchy) overcast drizzle shower	1 – 5	94
11:00	10	clear (patchy) overcast drizzle shower	1 – 4	92
11:35	10	clear (patchy) overcast drizzle shower	1 – 8	94
Stop 12:01	10	clear (patchy) overcast drizzle shower	1 – 7	94

Biological elements:

Rhaphiomidas terminatus ? ____ time ____ sex ____ numbers ____.

Other arthropods (general) Bombyliids ✓ Asilids ✓

Mydids ____ Apiocerids ✓ Sphecids ✓

Pompillids ✓ Scoliids ____ Chrysidids ____

Other insects of note Strymon melinus, Homoladisca sp., Agapostemon texana, B. exilis, Poecilognathus sp., Eristalis sp., Otitid (big head), Anax Junius, Bembix comata, H. phyladus, Sinea sp., Apiocera convergens or Episyron sp. (blk.), Trimerotropis californicus, Chlorochroa sp., Cynthia cardui, Pieris protodice, Eristalinus aeneus, Rhynchanthrax caprea, Philanthus multimaculatus, Myrmyleo sp. (sm.), Colias eurytheme, Schistocerca nitens, Nebejus acmon.

Vertebrates: ____

Comments:

Delhi sands flower-loving fly – General Field Form

Date 8 Sept 2017 Overall Time ________ Job ALDEN

Surveyor David K Faulkner Survey Partner(s) ∅

Mileage ________ (200358)

Weather:

Time (24 hr)	% Cloud	Sky	Winds (mph)	Temp (F)
Start 1040	∅ HAZE	(clear) patchy overcast drizzle shower	0-1	81°
		clear patchy overcast drizzle shower		
		clear patchy overcast drizzle shower		
Stop 1155	∅ HAZE	(clear) patchy overcast drizzle shower	0-1	82°

Biological elements:

Rhaphiomidas terminatus ? ____ time ____ sex ____ numbers ____.

Other arthropods (general) Bombyliids ✓ Asilids ____
Mydids ____ Apiocerids ____ Sphecids ✓
Pompillids ____ Scoliids ____ Chrysidids ____
Other insects of note Potter wasps, Polistes, Brachynemurus (2 species)
Larvae/adult Arctiids, V. cardui, S. melinus, fiery skipper, P. protodice, C. eurytheme

Plants: *Croton* ____ Telegraph weed ✓ *Eriogonum fasciculatum* ____
Eriogonum thurberi ____ other *Eriogonum* ____ *Oenothera* ____
Camissonia ____ *Eriastrum* ____
Others: Puncture vine

Vertebrates: ground squirrels, mocking birds

Comments:

Delhi sands flower-loving fly – General Field Form

Date 9/10/2017 Overall Time 1039 – 1154 Job Alden

Surveyor K H Osborne Survey Partner(s) ∅

Mileage 4034

Weather:

Time (24 hr)	% Cloud	Sky	Winds (mph)	Temp (F)
Start 1039	1	(clear) patchy overcast drizzle shower	0	90
		clear patchy overcast drizzle shower		
		clear patchy overcast drizzle shower		
Stop 1154	0	(clear) patchy overcast drizzle shower	0 – 3	94

Biological elements:
Rhaphiomidas terminatus ? ____ time ____ sex ____ numbers ____.

Other arthropods (general) Bombyliids ____ Asilids ____
Mydids ____ Apiocerids ____ Sphecids ✓
Pompillids ✓ Scoliids ____ Chrysidids ____
Other insects of note Bombix, Sympetrum, Colias, Pontia, P. acmon 12 stigmone, Zelus r., Scutellerid, Myrmeleontid, Hyles(?) Cotinus, Schinis sexplagiata.

Vertebrates:

Comments:

Delhi sands flower-loving fly – General Field Form

Date Sept. 13, 2017 Overall Time 1 hr. 15 min. Job Alden

Surveyor Rick Rogers Survey Partner(s) 0

Mileage 51206

Weather:

Time (24 hr)	% Cloud	Sky	Winds (mph)	Temp (F)
Start 11:20	0	(clear) patchy overcast drizzle shower	2-4	88
11:45	0	(clear) patchy overcast drizzle shower	1-4	87
12:00	0	(clear) patchy overcast drizzle shower	1-5	88
Stop 12:35	0	(clear) patchy overcast drizzle shower	2-4	89

Biological elements:

Rhaphiomidas terminatus ? _____ time _____ sex _____ numbers ____.

Other arthropods (general) Bombyliids ✓ Asilids _____
Mydids _____ Apiocerids _____ Sphecids ✓
Pompillids _____ Scoliids _____ Chrysidids _____
Other insects of note Agoshrea multicolor, Bembix comata, Eucerceris femurrubrum, Cynthia cardui, Colias eurytheme, Plebejus acmon, Pantala flavescens, Rhyncanthrax cagrea, Muscophus sp. Trimerotropis californica, Chlorochroa sp., Philanthus multimaculatus, Eristalinus aeneus, Zelus sp., Amberwing Dragonfly, Strymon melinus, Pantala hymaenea, Myrmyleb sp.

Vertebrates: _____

Comments:

Delhi sands flower-loving fly – General Field Form

Date 9/16/2017 Overall Time 1042-1157 Job Alder [illegible]

Surveyor KH Osborn Survey Partner(s) 0

Mileage 4284

Weather:

Time (24 hr)	% Cloud	Sky	Winds (mph)	Temp (F)
Start 1042	99	clear patchy **overcast** drizzle shower	3-5	75
1120	50	clear **patchy** overcast drizzle shower	0-5	80
1134	50	clear **patchy** overcast drizzle shower	0-3	85
Stop 1157	30	clear **patchy** overcast drizzle shower	4-7	80

Biological elements:

Rhaphiomidas terminatus ? ____time ______ sex _____ numbers ____.

Other arthropods (general) Bombyliids ✓ Asilids ______
Mydids ______ Apiocerids __________ Sphecids •
Pompillids ✓ Scoliids ______________ Chrysidids __________
Other insects of note Vc, Pacnau, Hylephila, V. molitar, Estigmine Ammophila Pontia, Aeshna, Colias, Junonia Eristalis brown, Eristalis b/w, Musca, Hem S, Cydnid, Scutelarid Hym 19 Mymorlovtid, Sympetrum, Pantella f.

Plants: *Croton* _____ Telegraph weed _________ *Eriogonum fasciculatum* ___
Eriogonum thurberi ______ other *Eriogonum* ________ *Oenothera* _____
Camissonia __________ *Eriastrum* __________
Others:

Vertebrates:

Comments:

Delhi sands flower-loving fly – General Field Form

Date Sept. 20, 2017 Overall Time 1 hr. 15 min. Job Alden

Surveyor Rick Reagors Survey Partner(s) 0

Mileage 52334

Weather:

Time (24 hr)	% Cloud	Sky	Winds (mph)	Temp (F)
Start 11:20	100	clear patchy (overcast) drizzle shower	Calm	76
12:00	100	clear patchy (overcast) drizzle shower	Calm	76
12:20	100	clear patchy (overcast) drizzle shower	Calm	76
Stop 12:35	100	clear patchy (overcast) drizzle shower	Calm	76

Biological elements:

Rhaphiomidas terminatus ? _____ time _____ sex _____ numbers ____.

Other arthropods (general) Bombyliids ✓ Asilids ✓

Mydids _____ Apiocerids _____ Sphecids ✓

Pompillids ✓ Scoliids ✓ Chrysidids _____

Other insects of note Rhynchanthrax caprea, Copestylum mexicana, Cynthia cardui, Chrysomyia sp. (cuffate mesohotum), Nemorilla sp. (Tachinidae), H. phyldeis, Campsomeris tolteca ♀, Chlorochroa sp., "Bird-Dropping" moth, Leschenaultia sp. (Tach.), Eristulinus taenops, Eristalis stipator, Sembix comata, Symptrum corruptum, Palpada mexicana, pompilid sp. (red-blk.), Sinea sp., Zelus sp., Elcercleris femurrubrum, Ammophila azteca, A. aberti, Bicrytes ventralis, Evodyneurus sp., Pieris protodice, Megachile sp. (sm.), Myrmyleo sp. (sm.), Agapostemon texana

Vertebrates: _____

Comments:

Appendix G

NEPSSA Survey Report

ALDEN ENVIRONMENTAL, INC
3245 University Ave, #1188 | San Diego, CA 92104 | **Phone/Fax:** 619.284.3815

July 28, 2017

Mr. Jackson Smith
Newcastle Partners, Inc.
4740 Green River Road, Ste. 118
Corona, CA 92880

Re: Narrow Endemic Plant Species Survey Report for the South Milliken Distribution Center Project

Dear Mr. Smith:

This letter presents the results of the 2017 spring and summer surveys for Narrow Endemic plant species conducted by Alden Environmental, Inc. on the South Milliken Distribution Center Project (project) site in the City of Eastvale, California (City).

LOCATION AND SITE DESCRIPTION

The project site is located in the City, east of Milliken Avenue, north of State Route 60, and west of Interstate 15 (Figures 1 and 2). It is located in Section 6, Township 2S, Range 6W on the United States Geological Survey (USGS) Guasti, California quadrangle, 7.5-minute series topographic map. The project site is comprised of Assessor Parcels numbered 156-030-001 and 156-030-002.

The project site is within the boundaries of the Jurupa Area Plan of the Western Riverside County Multiple Species Habitat Conservation Plan. It is in Independent Criteria Cell 35 of Subunit 3 (Delhi Sands Area). The project site is also located in a Narrow Endemic Plant Species Survey Area (NEPSSA).

METHODS

According to the report generated using the Riverside County Integrated Project (RCIP) Conservation Summary Report Generator, San Diego ambrosia (*Ambrosia pumila*; federal listed endangered, California Native Plant Society [CNPS] Rare Plant Rank 1B.1), Brand's phacelia (*Phacelia stellaris*; CNPS Rare Plant Rank 1B.1), and San Miguel savory (*Clinopodium* [*Satureja*] *chandleri*; CNPS Rare Plant Rank 1B.2) habitat may be present on site. Therefore, focused surveys for these NEPSSA species were conducted on March 27 and July 27, 2017 by Sandra Leatherman, Brian Leatherman, and Gregory Stratton. Ms. Leatherman, a Principal Biologist with more than 20 years of experience, has conducted numerous surveys for all three of these species. Gregory Stratton and Brian Leatherman, both of whom are familiar with these species, assisted Ms. Leatherman during the surveys.

Prior to conducting the surveys, a search of the California Natural Diversity Database (CNDDB) was conducted for the Guasti and Corona North USGS 7.5-minute series quadrangle maps, and the CNPS Inventory of Rare and Endangered Plants was queried for potential occurrence of any sensitive species in the project vicinity. Brand's phacelia was the only species that came up on the CNDDB and CNPS database searches.

The surveys were conducted following the 2006 California Department of Fish and Game *Guidelines for Assessing the Effects of Proposed Project on Rare, Threatened, and Endangered Plants and Natural Communities* and the 2001 CNPS *Botanical Survey Guidelines*. The two surveys were performed during the spring and summer when most plant species would be detectable.

The March 27, 2017 survey was scheduled during the appropriate blooming period for Brand's phacelia. Prior to conducting the survey, a reference population of Brand's phacelia at Rancho Jurupa Park was visited to document the phenology of the plants at the time of the survey. This is the only known location for this species in Riverside County, and no plants were during the visit. However this species was known to be blooming during this time period in San Diego County.

The July 27, 2017 survey was scheduled during the blooming period for San Diego ambrosia. Immediately prior to the site visit on July 27, 2017, a reference population of San Diego ambrosia was visited in Lake Elsinore, and it was in full bloom. Both of the survey dates overlap the blooming period for San Miguel savory.

SURVEY RESULTS

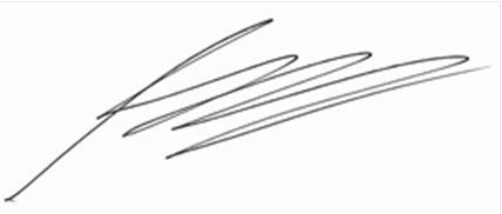
The majority of the project site is periodically plowed. The entire site shows signs of some previous disturbance. Some portions of the site are highly disturbed. The soils on site are very loose and sandy. No undisturbed soils, native habitats, or other features occur on site that are likely to support sensitive plant species, and none of three Narrow Endemic plant species on the RCIP Conservation Summary Report was observed.

San Diego ambrosia is the only one of the three NEPSSA species with potential to occur, and that potential is limited. Suitable habitat for San Diego ambrosia includes open floodplain terraces or margins of vernal pools dominated by sparse, non-native grasslands or ruderal habitat with gravelly, fine, sandy loams or alkali playas. The project site supports ruderal habitat with sandy soils.

There is no suitable habitat for Brand's phacelia (sandy washes and or benches in alluvial flood plains with periodic flooding) or San Miguel Savory (coastal sage scrub, chaparral, cismontane woodland, grasslands with gabbroic and metavolcanic substrates) present on site.

Please contact me if you have any questions.

Sincerely,



Greg Mason
Senior Biologist

Enclosures:

Figure 1	Regional Location Map
Figure 2	Project Location Map

Appendix H

Habitat Conditions for the Delhi Sands Flower-loving Fly

Ken H. Osborne
Osborne Biological Consulting
6675 Avenue Juan Diaz
Riverside, CA 92509

June 8, 2017

Attn: Mr. Greg Mason
Alden Environmental, Inc
3245 University Ave., #1188
San Diego, CA 92104

RE: Habitat conditions for Delhi Sands Flower-loving Fly on 15.5 acres, APN 156-030-001, and -002, on the northeastern intersection of S. Milliken Avenue and Hwy 60, Riverside County, CA.

To Whom It May Concern:

Alden Environmental, Inc. has requested my evaluation of habitat suitability for the federally endangered Delhi Sands Flower-loving Fly (DSF, *Rhaphiomidas terminatus abdominalis*), for a 15.5-acre lot, APN 156-030-001, and -002, located on the northeastern intersection of S. Milliken Avenue and Hwy 60, Riverside County, CA. (Figure 1). For the purpose of this habitat assessment, I have evaluated site conditions for DSF suitability in terms of site characteristics on the basis of a detailed grading system I have developed in recent years.

Summary Conclusions: A field evaluation found Delhi sands distributed throughout the subject site. The site is an undeveloped lot, with the western half of the area in viticulture. I rate the site as representing High Quality habitat for DSF and conclude the subject site has potential to support a population of DSF. Pursuant to the Interim General Survey Guidelines for the DSF, suggested by the USFWS (1996) surveys for this species prior to development of the site, are recommended.

Methods: On June 6, 2017, I visited the study site in order to investigate habitat suitability for the DSF. I have reviewed soil maps and aerial imagery covering the subject site, prepared by the California Department of Agriculture (Knecht 1971, Woodruff 1980), this data additionally presented through http://casoilresource.lawr.ucdavis.edu/gmap/). Satellite imagery covering the site, dating from 1994 to 2016 (Google Earth), and additional historic aerial images covering the site back to 1935, were reviewed in order to gain further understanding (beyond my own casual observations over the last two decades) of land use regimens in recent years. Photographs were taken of the site along with field notes on vegetation and soil conditions. I examined the subject site to rate its potential to support DSF, the rating (Osborne 2003, Osborne et al 2003) based on the following scale of 1 to 5, with 5 being the best quality and most suitable habitat in my judgment:

1. Developed areas, non-Delhi sands soils with high clay, silt, and/or gravel content. Delhi sands extensively and deeply covered by dumping of exotic soils, rubble, trash, manure, or organic debris. *Unsuitable.*

2. Delhi sands are present but the soil characteristics include a predominance of exotic soils such as alluvial materials, or predominance of other foreign contamination as gravels, manure, or organic debris. Severe and frequent disturbance (such as a maintenance yard or high use roadbed). *Very Low Quality.*

3. Moderately contaminated Delhi sands. Delhi sands with moderate to high disturbance (such as annual disking). Sufficient Delhi Sands are present to prevent soil compaction (related to contamination by foreign soils). Some sandy soils exposed on the surface due to fossorial animal activity. *Low Quality.*

4. Abundant clean Delhi Sands with little or no foreign soils (such as alluvial material) present. Moderate abundance of exposed sands on the soil surface. Low vegetative cover. Evidence of moderate degree of fossorial animal activity by vertebrates and invertebrates. May represent high quality habitat with mild or superficial disturbance. *Moderate Quality*

5. Sand dune habitat with clean Delhi Sands. High abundance of exposed sands on the soil surface. Low vegetative cover. Evidence (soil surface often gives under foot) of high degree of fossorial animal activity by vertebrates and invertebrates. Sand associated plant and arthropod species may be abundant and vegetation species composition is often indicative of low disturbance. *High Quality*

It should be noted that habitat qualities often vary spatially within a site so that conditions on a site fall within a range of qualities. Further, overall habitat quality is affected by the overall habitat area on a site, such that very small areas diminish the overall habitat value of a site. Habitat conditions rated from *Very Low Quality* up to *High Quality*, are formally considered as representing *Suitable* conditions for the DSF. Use of this habitat rating system is somewhat subjective and best undertaken by a biologist who has extensive experience with *Rhaphiomidas* species and understanding of their biology and ecology. It must be noted that these ratings do not infer or imply actual occupancy by DSF, only relative potential to harbor the species, and relative conservation value of the land should DSF be found.

Results: Department of Agriculture, Soil Conservation Service map (Knecht 1971) indicate Delhi sands soils on the majority of the site, with a small inclusion of Gorgonio loamy sand on a southern central portion of the site. However, field observations determined that Delhi sand soils extend over the entire site and soil differences are not apparent across the site. The western portion of the site remains in viticulture (Figure 3). Plant species normally associated with Delhi sands ecosystems, including *Ambrosia acanthicarpa, Heterotheca grandiflora,* and *Camissonia bistorta* (Figure 6) occur on the site. A history of extremely disking has likely mixed Delhi sands with loamy sands so that sands are more generally distributed than might have otherwise been the case under undisturbed conditions. Sand associated insects including especially sand digging wasps (*Bembix*) and the robber fly, *Stenopogon lomae* were observed widely over the site.

Just twenty years ago, the site is set in the larger context of similar adjacent undeveloped lands, with large areas in viticulture. Today, the site represents one of the few remnants of undeveloped land amidst a mosaic of properties developed to commercial use. To a much greater extent than before, intervening roads and developed parcels separate the site from other areas with suitable habitat for DSF. However, the DSF has been documented on lands within one kilometer (and beyond), with examples being approximately 0.6 km WNW to 0.27 km NNW of the subject site,

and one observation 3.6 km ENE of the subject site (Figure 1). All of these DSF observations are over a decade old.

Discussion: Though partially mapped with Delhi sands (Knecht 1971), aeolian sands were found to be extensive with distribution throughout the site. Disking commonly mixes and blurs the transition from Delhi sands to non Delhi sand soils, and these boundaries are often graded anyway. The disking to which this site has been subjected in weed control efforts over the years would have thoroughly blurred any natural bounds between soil types.

Results of recent research efforts (Osborne and Ballmer 2014) have lead to emerging revelations that *Rhaphiomidas* biology (highly mobile larvae are predatory on soil dwelling arthropods, may take years to develop) is dependent on functional, sand associated ecosystems with vegetation and associated trophic structure comprised of a diverse arthropod assemblage. In this context, it is interesting that the robber fly (*Stenopogon lomae*) was found in abundance, as in my experience this fly ordinarily occurs on relatively undisturbed sites generally associated with high insect species diversity.

As a federally endangered species with more than 97% of its habitat already lost, and its populations reduced to few and far between, the odds of finding the DSF on any random site (such as the subject site for this evaluation) within its former range, is very low, and so by this virtue alone, it is unlikely that a survey of the subject site will produce observations of DSF. The same can be said for all endangered species, wherein a random search of any species-appropriate-habitat usually results with negative findings.

As for the subject site, since the time of listing, DSF has been found in multiple observations ranging from approximately 600 meters WNW to 275 meters NNW of the subject site, and this constellation of observations in the immediate vicinity of the subject site represents the highest density of DSF anywhere within the Ontario (see USFWS 1997) Recovery Unit. It is noteworthy, however, that recent surveys of this area have failed to produce DSF (Osborne 2016). Although the probability is low that DSF may be found in a survey of the subject site, this subject site, together with similar sites immediately south of this (south of the 60 freeway, both east and west of Milliken Avenue) represent, to my view, the area with the highest probability for DSF within the Ontario area.

The DSF have often been found on abandoned vineyards, but what about the subject site, where active weed control (and associated disturbance) has been in effect? Actually, recent revelations concerning the ecology of *Rhaphiomidas* flies (Osborne and Ballmer 2014), and the impacts of exotic weeds adversely altering the suitability of habitats (Osborne 2016, Osborne 2016a) for these flies (and DSF in particular) have led to precisely such disturbance being deliberately effected on DSF conservations sites – by use of All Terrain Vehicles and other mechanical means of scraping the soil surface to eliminate dense weed cover. These "disturbance" efforts have produced dramatic results toward improvement of DSF habitat quality at the MSHCP Teledyne site (south of Fontana), Managed by the Riverside County Parks Department and MSHCP Biological Monitoring Group (Jonathan Reining, pers. com. May 2017). Emergence of adult DSF at the soil surface (and hence development below surface) is occurring precisely where these weed abatement activities have been undertaken!

The weed control, and associated soil surface disturbance on the subject site then, have likely enhanced conditions for potential DSF on the site.

Conclusions and Recommendations: I rate the site as *High Quality* for DSF. On the basis of my experience, conditions on the subject site are suitable for DSF. Interim General Survey Guidelines for the DSF, suggested by the USFWS (1996) recommend protocol surveys for DSF where undeveloped Delhi sands occur.

References:

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Osborne, K. H. 2003. *Delhi Sands Flower-loving fly Habitat Assessment for the Hermosa Cemetery, Colton.* Prepared for Inland Memorial Cremations and Burial. Submitted to the U.S. Fish and Wildlife Service, CA.

Osborne, K. H. 2016. Second year focused survey for Delhi Sands Flower-loving Fly (*Rhaphiomidas terminatus abdominalis*) on the 10-acre Bloch site, Ontario, San Bernardino County, California.

Osborne, K. H. 2016a. Focused survey for Delhi Sands Flower-loving Fly (*Rhaphiomidas terminatus abdominalis*) on a 5acre site in Colton, San Bernardino County, California.

Osborne, K. H., G. R. Ballmer, and T. McGill. 2003. *DSF Habitat Assessment for the Proposed Mary Vagle Conservation Area.* Prepared for the City of Fontana. Submitted to the U.S. Fish and Wildlife Service, CA.

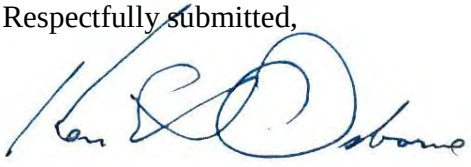
Osborne, K. H. and Gregory R. Ballmer. 2014. A Petition to the United States Department of the Interior, Fish and Wildlife Service, for emergency action to list an endangered species pursuant to the conditions and regulations of the Federal Endangered Species Act: For the San Joaquin Valley Giant Flower-loving Fly (*Rhaphiomidas trochilus*). Submitted June, 2014.

U.S. Fish and Wildlife Service. 1996. Delhi Sands Flower-loving Fly Draft Presence/Absence Survey Guidelines. December 30.

U.S. Fish and Wildlife Service. 1997. Delhi Sands Flower-loving Fly (*Rhaphiomidas terminatus abdominalis*) Recovery Plan. September 14.

Woodruff, G. A. 1980. Soil survey of San Bernardino County, southwestern part, California. U.S. Department of Agriculture, Soil Conservation Service.

Respectfully submitted,



Ken H. Osborne

Figure 1. Satellite image (Google Earth) with vicinity of the subject site (outlined in blue). Red dots represent some of the localities known with DSF in the neighborhood of the subject site.

Figure 2. Approximate locations around survey site from which photographs were taken (base of arrows). Arrow indicates the direction a photograph was taken. Numbers next to the arrows indicate figure numbers (Figures 3-6).

Figure 3. Habitat conditions on a western portion of the subject site, here the view looking to the east showing viticulture on sandy substrate with annual weeds generally cleared.

Figure 4. Photograph showing open sandy soils on a central southern portion of the site.

Figure 5. Photograph of an eastern portion of the site (not in viticulture) with exposed sands.

Figure 6. Photograph of close view of exposed Delhi sands with *Camissonia* in foreground.

Appendix I

Burrowing Owl Survey Report

ALDEN ENVIRONMENTAL, INC
3245 University Ave, #1188 | San Diego, CA 92104 | **Phone/Fax:** 619.284.3815

August 16, 2017

Mr. Jackson Smith
Newcastle Partners, Inc.
4740 Green River Road, Ste. 118
Corona, CA 92880

Re: Burrowing Owl Survey Report for the South Milliken Distribution Center Project

Dear Mr. Smith:

This letter presents the results of the 2017 nesting season survey for the burrowing owl (*Athene cunicularia*) conducted by Alden Environmental, Inc. for the South Milliken Distribution Center Project (project) in the city of Eastvale, CA (City).

LOCATION AND SITE DESCRIPTION

The 15.8-acre project site is located in the City at 3100 Milliken Avenue (Figures 1 and 2) and within the Western Riverside County Multiple Species Habitat Conservation Plan (MSHCP) Burrowing Owl Survey Area.

The site is heavily disturbed and surrounded on all sides by disturbed or developed land and is not within or adjacent to any wildlife corridor but is within Non-contiguous Habitat Block 1 of the MSHCP Conservation Area. The site is entirely flat and appears to have been an old agricultural field in the east, and an unused vineyard on the west with old grape plants throughout. The majority of the site is periodically plowed. Non-native, annual grasses occur along site boundaries, primarily along the fence lines. Patches of native herbs (Rancher's fiddleneck) and non-native plants occur throughout this lower disturbance-level area. California ground squirrel (*Otospermophilus beecheyi*) burrows are present on site.

Burrowing owls generally occur in drier, open areas that can include prairies, grasslands, and savannas. The burrowing owl can also be found in deserts, farmlands, pastures, cemeteries, airports, vacant lots, university campuses, golf courses, and other urban areas. Burrowing owls are dependent on the presence of fossorial mammals (primarily prairie dogs and ground squirrels), whose burrows are used for nesting and roosting.

Based on the habitat conditions on site, the entire site is considered to have potential to support the burrowing owl. Additionally, undeveloped, disturbed land immediately north of the project site that supports ruderal vegetation is also considered to have potential to support the species (Figure 3).

METHODS

The burrowing owl survey consisted of a focused burrow survey and focused burrowing owl survey (Table 1) according to the *Burrowing Owl Survey Instructions for the Western Riverside MSHCP Area*.[1] The survey was conducted by walking parallel transects at intervals of approximately 15 meters over the entire project site and land immediately off-site to the north that was accessible (Figure 3). Most of the suitable habitat to the north was fenced with posted no trespassing signs, so the fenced area was surveyed only with the use of binoculars. The remainder of the 500-foot buffer around the site consists of developed land not suitable for the burrowing owl or undeveloped land separated from the project site by Milliken Avenue and State Route 60. That undeveloped land was not surveyed because of its separation from the project site by those roadways and because access was not allowed due to fencing and highway right-of-way.

The survey area was searched for burrows, artificial refugia, or perches that could be used by the owl, as well as for burrowing owls and owl sign. Burrowing owls are known to occupy California ground squirrel burrows; therefore, particular attention was paid to those on site (Figure 3; Photos 3 and 8 in Attachment A), as well as any other locations where squirrel activity was observed or was likely to occur. Debris piles (e.g., discarded tires), the on-site concrete-lined drainage channel, and a fallen billboard (Photos 7 through 9 in Attachment A) were carefully examined as these sites may provide cavities that could be used by burrowing owls. The determination of owl presence is made by direct owl observation or by owl sign such as, but not necessarily limited to, excavated soil, whitewash (excrement), castings (pellets), and/or feathers. Representative site photographs are presented as Attachment A.

Table 1
BURROWING OWL SURVEY INFORMATION

Visit Number	Date	Biologist	Time (start/stop)	Weather Conditions[1] (start/stop)
1	3/20/17	Greg Stratton	0615/1015	100%, 58°F, wind 1-3 mph/ 100%, 67°F, wind 1-3 mph
2	3/24/17	Greg Stratton	0615/0945	Clear, 48°F, wind 1-3 mph / Clear, 62°F, wind 1-3 mph
3	3/27/17	Greg Stratton	0615/1000	80%, 58°F, wind 1-3 mph / 70%, 62°F, wind 1-3 mph
4	3/29/17	Adam Deluna	0615/945	Clear, 52°F, wind 1-3 mph / Clear, 80°F, wind 1-3 mph

[1] Estimated cloud cover, temperature, and wind speed

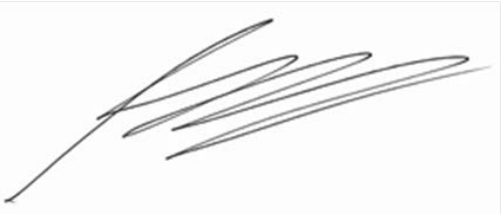
[1] County of Riverside. 2006. Burrowing Owl Survey Instructions for the Western Riverside Multiple Species Habitat Conservation Plan Area. March 29.

SURVEY RESULTS

Eleven California ground squirrel burrows were observed along with debris piles (e.g., discarded tires), a concrete-lined drainage channel, and a fallen billboard that could provide artificial refugia for the burrowing owl (Figure 3 and Attachment A). There were also other locations that appeared to have digging activity, but they were either too small for the burrowing owl, were dug up by coyotes (*Canis latrans*) or dogs (*Canis familiaris*), or had collapsed due to the sandy soil. No burrowing owls or sign of burrowing owls was observed during the survey.

Please contact me if you have any questions.

Sincerely,



Greg Mason
Senior Biologist

Enclosures:

Figure 1	Regional Location Map
Figure 2	Project Location Map
Figure 3	Burrowing Owl Survey Results
Attachment A	Representative Photographs

Figure 1

Regional Location

SOUTH MILLIKEN DISTRIBUTION CENTER

ALDEN ENVIRONMENTAL, INC

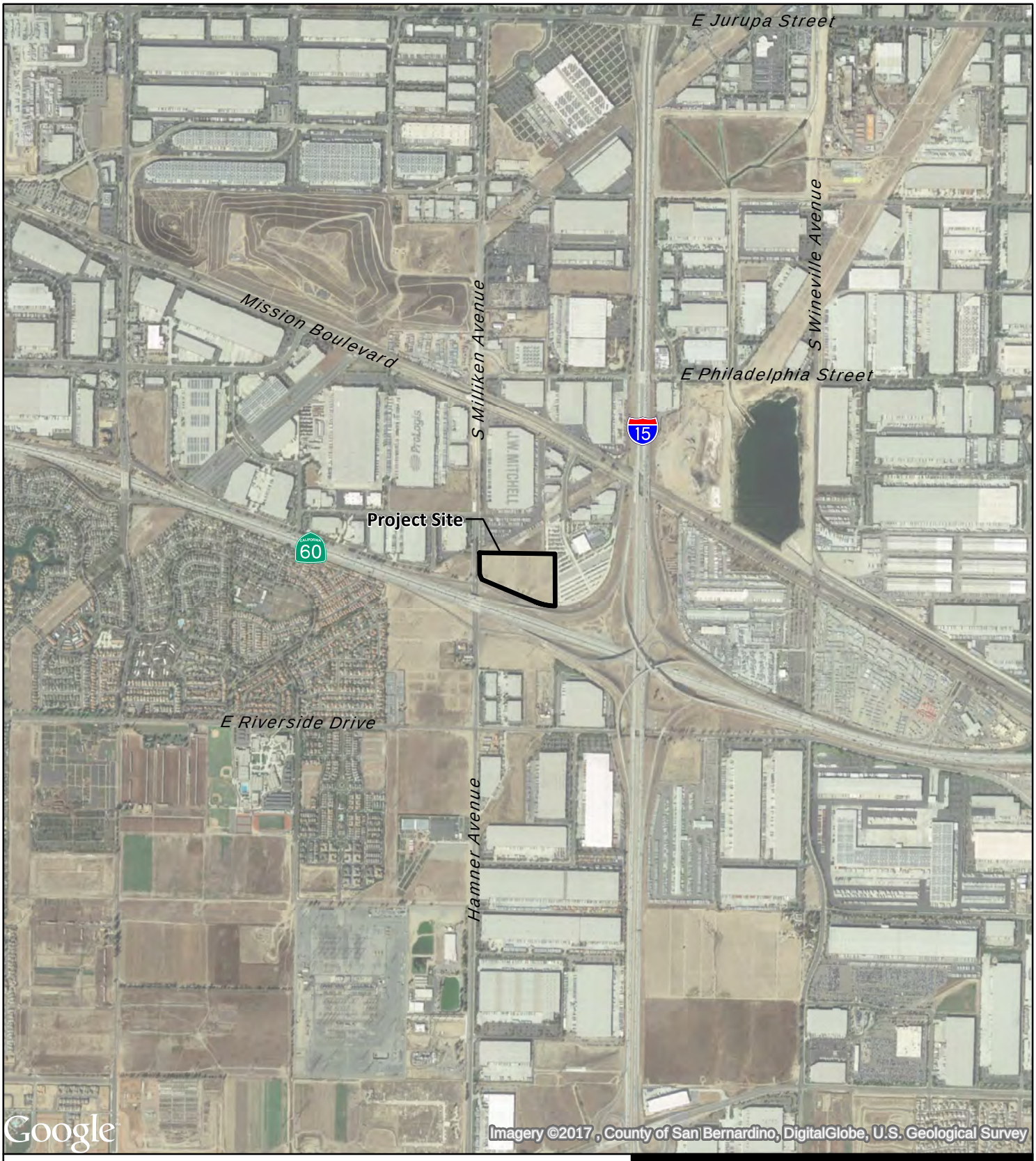


Figure 2

Project Location

SOUTH MILLIKEN DISTRIBUTION CENTER

N
W E
S

0 1,000 2,000 Feet

ALDEN ENVIRONMENTAL, INC

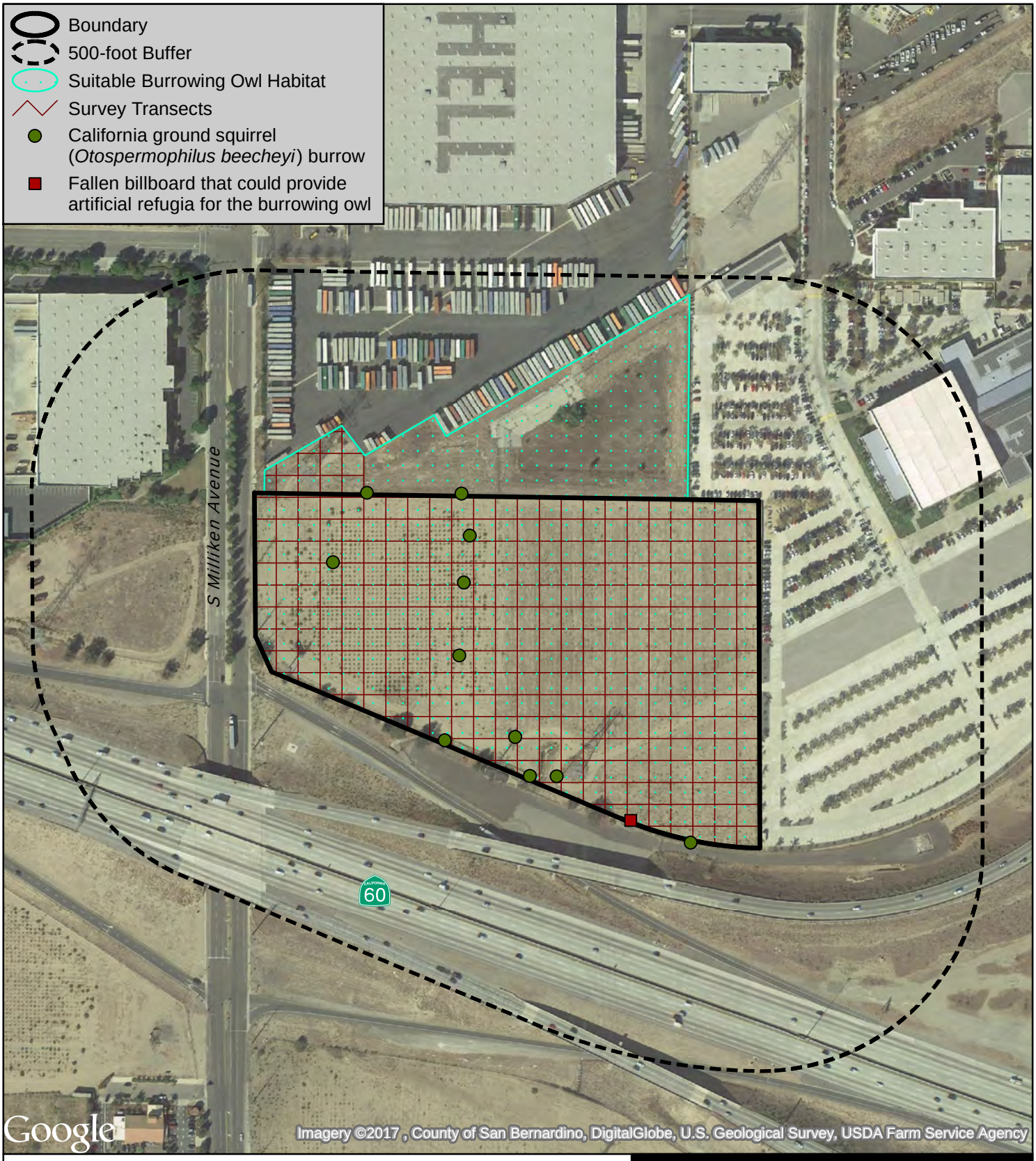


Figure 3

Burrowing Owl Survey Results

SOUTH MILLIKEN DISTRIBUTION CENTER

N
W E
S

0 150 300 Feet

ALDEN ENVIRONMENTAL, INC

Attachment A

REPRESENTATIVE PHOTOGRAPHS

Photo 1

Photo 2

Photo 3

Photo 4

Photo 5

Photo 6

Photo 7

Photo 8