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Subject: **BIOLOGICAL RESOURCES TECHNICAL REPORT**
DOCKET NO. (09-AFC-6)

Enclosed for filing with the California Energy Commission is the Biological Resources Technical Report for the Blythe Solar Power Project (09-AFC-6).

Sincerely,

Arrie Bachrach

BLYTHE SOLAR POWER PROJECT
BIOLOGICAL RESOURCES TECHNICAL REPORT
RIVERSIDE COUNTY, CALIFORNIA

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NOTE TO READER

The following terms will be used throughout this report:

- AFC Disturbance Area: This is the original Disturbance Area as reported in the Application for Certification (AFC), submitted in August 2009.
- Project Disturbance Area: This is the proposed Blythe Solar Power Project (BSPP) Disturbance Area that includes the entire Proposed Project footprint (area within solar plant site fence line including solar fields, power block, transmission facilities, office and maintenance buildings, laydown area, bioremediation area, and leach fields as described in further detail below). It does not include the Colorado River Substation (CRSS), which will be permitted, constructed and operated by Southern California Edison (SCE).
- Proposed Project Study Area: This includes the proposed BSPP Disturbance Area plus additional areas surveyed during 2009 and 2010 but that ultimately will not be disturbed by BSPP, such as the survey area for the CRSS and associated buffers that will be permitted, constructed and operated by SCE.
- Proposed Project Biological Resources Survey Area (BRSA): The Proposed Project BRSA includes the Project Disturbance Area, Proposed Project Study Area, and all associated buffers.
- Reconfigured Alternative Disturbance Area: The Reconfigured Alternative Disturbance Area encompasses the disturbance resulting from the proposed construction of the reconfigured alternative solar power blocks only (solar heat exchangers, steam turbine generator and other components listed in the project description below), and their associated solar fields.
- Reconfigured Alternative BRSA: The Reconfigured Alternative BRSA includes the Reconfigured Alternative Disturbance Area and all associated buffers.
- Combined Survey Area: The Combined Survey Area is the Proposed Project BRSA and the Reconfigured Alternative BRSA. This encompasses all areas surveyed during 2009 and 2010 (the collective total area surveyed to date by AECOM for the BSPP).

All figures are included in Attachment A of this Biological Resources Technical Report (BRTR).

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EXECUTIVE SUMMARY

AECOM performed biological resources studies for Palo Verde Solar I, LLC (the Applicant) for the proposed Blythe Solar Power Project (BSPP) located in Riverside County, California. The BSPP is proposed on lands owned by the Federal government and administered by the Bureau of Land Management (BLM). Use of the Federal land would involve issuance of a right-of-way (ROW) grant to the Applicant by the BLM. The Applicant proposes to construct commercial solar thermal power-generating facility using solar parabolic trough technology to generate electricity with a 1,000-megawatt (MW) of nominal capacity. This Proposed Project and a Reconfigured Alternative are analyzed as a part of this Biological Resources Technical Report (BRTR). The Reconfigured Alternative would include a nominal 1,000-MW solar facility, similar to the Proposed Project, of which approximately 480 acres would be located outside of the current ROW application area, but would remain within lands managed by the BLM.

The total Project Disturbance Area would be 7,025 acres and the total Reconfigured Alternative Disturbance Area would be 5,547 acres. These areas cover what would be disturbed by construction-related activities and operation for the Proposed Project and Reconfigured Alternative, respectively. The Biological Resources Study Area (BRSA) for each alternative includes the Disturbance Area plus a 1-mile buffer zone. The total Proposed Project BRSA encompasses 24,592 acres and the total Reconfigured Alternative BRSA encompasses 20,212 acres.

This BRTR was prepared to support the process for Power Plant Site Certification with the California Energy Commission (CEC), which must conduct environmental review to license all thermal power plants more than 50 MW in California pursuant to 20 CCR §§ 1741 *et seq*. Because the BSPP is proposed on Federal land, compliance with the National Environmental Policy Act (NEPA) is also required. The CEC and BLM have been conducting a joint review of the BSPP through a combined California Environmental Quality Act (CEQA)/NEPA document. The joint Staff Assessment/Draft Environmental Impact Statement (SA/DEIS) for the BSPP was docketed on March 11, 2010. The SA/DEIS included preliminary review of the Reconfigured Alternative. This BRTR will be used to support a Revised Staff Assessment and the remainder of the CEC certification process. A separate NEPA document may be prepared by BLM; this BRTR will support BLM's NEPA document. The BRTR also will support the permitting requirements of State and Federal biological resources agencies. (e.g., U.S. Fish and Wildlife Service [USFWS] and the California Department of Fish and Game [CDFG]).

The major focus of the biological investigation was to assess potential impacts to special status plant and wildlife species that may occur within the Proposed Project BRSA and the Reconfigured Alternative BRSA. Surveys were conducted to map vegetation communities and waters of the State and to determine the presence or absence of special status plant and wildlife species. These surveys were conducted in accordance with applicable regulations and established survey protocols for various special status species. The fieldwork focused on rare plant surveys, delineation of jurisdictional areas, protocol surveys for desert tortoise (*Gopherus agassizii*; DT) and western burrowing owl (*Athene cunicularia hypugaea*; WBO), avian point count surveys, and a general wildlife inventory.

Eight vegetation communities and other cover types were identified in the Combined Survey Area: desert dry wash woodland, creosote bush – big galleta association, Sonoran creosote bush scrub, stabilized and partially stabilized desert dunes, unvegetated ephemeral dry wash, agricultural fields, disturbed habitat, and developed areas. The majority of the Combined Survey Area is composed of Sonoran creosote bush scrub. Three of the eight vegetation communities are considered sensitive: creosote bush – big galleta association, desert dry wash woodland, and unvegetated ephemeral dry wash. Desert dry wash woodland, and unvegetated ephemeral dry wash are considered sensitive because they are also State waters under the jurisdiction of CDFG. In addition, the creosote bush – big galleta grass association and dry desert wash woodland are special community types per CDFG (e.g., high priority for inventory in the California Natural Diversity Database).

A formal jurisdictional delineation of waters indicated that there are no waters on site that would be considered jurisdictional by the U.S. Army Corps of Engineers (USACE). At the time of this writing the USACE has not yet made this final determination, although USACE has informed the Applicant that an Approved Jurisdictional Determination concluding that there are no waters of the United States present within the Project Disturbance Area will be issued in June 2010 (pers. comm. Jim Mace USACE). However, the washes are considered state jurisdictional waters subject to the CDFG jurisdiction. There are approximately 206 acres of State jurisdictional waters within the Project Disturbance Area and approximately 176 acres within the Reconfigured Alternative Disturbance Area that would be directly impacted. Impacts on State jurisdictional waters would be mitigated to less than significant through onsite or offsite mitigation.

Seven special status plant species were detected within the Proposed Project BRSA. No federally listed or state-listed plant species were detected during surveys, but three of the special status species detected are California Native Plant Society (CNPS) List 1B or List 2 (rare) and therefore require consideration under CEQA: Harwood's woollystar (*Eriastrum harwoodii*), Harwood's milkvetch (*Astragalus insularis* var. *harwoodii*), and Las Animas colubrina

(*Colubrina californica*). The remaining four species are on CNPS List 4 (watch-list) and are recommended for consideration under CEQA, but this consideration may not be required pending agency review: ribbed cryptantha (*Cryptantha costata*), winged cryptantha (*Cryptantha holoptera*), Utah milkvine (*Cynanchum utahense*), and desert unicorn (*Proboscidea althaefolia*). With the exception of winged cryptantha, which only occurs in the buffer, each of the seven special status plant species observed within the Proposed Project BRSA has multiple documented occurrences within the Disturbance Area and the buffer area.

Five special status plant species were detected within the Reconfigured Alternative BRSA. No federally listed or State-listed plant species were detected during surveys, but two of the special status species detected are CNPS List 1B or List 2 and therefore require consideration under CEQA: Harwood's milkvetch (*Astragalus insularis* var. *harwoodii*) and Las Animas colubrina (*Colubrina californica*). The remaining three species are on CNPS List 4 and are recommended for consideration under CEQA, but this consideration may not be required pending agency review: winged cryptantha (*Cryptantha holoptera*), Utah milkvine (*Cynanchum utahense*), and desert unicorn (*Proboscidea althaefolia*). With the exception of winged cryptantha, which only occurs in the buffer, each of the five species observed within the Reconfigured Alternative BRSA has multiple documented occurrences within the Reconfigured Alternative Disturbance Area and the buffer area.

There were several species of cactus recorded in the Proposed Project BRSA and the Reconfigured Alternative BRSA, two of which were identified by BLM to receive special mapping consideration for future salvage: California barrel cactus (*Ferocactus cylindraceus* var. *cylindraceus*) and cottontop cactus (*Echinocactus polycephalus* var. *polycephalus*).

Impacts on non-listed special status plant species will be mitigated to less than significant through implementation of avoidance, minimization, and mitigation measures.

Six adult DTs, a Federally listed and State-listed threatened species, were encountered within the Proposed Project BRSA and one DT was encountered within the Project Disturbance Area. Six adult DTs were encountered within the Reconfigured Alternative BRSA and one DT was encountered within the Reconfigured Alternative Disturbance Area. The USFWS guidelines cannot be applied to calculate DT density at the BSPP due to the low number of DTs found in the Proposed Project BRSA and the Reconfigured Alternative BRSA. The USFWS model requires a minimum of 20 individual DTs to be observed during surveys (USFWS 2009). Because only six DTs were observed in the Combined Survey Area and the USFWS model is not applicable indicates that DTs are present at a low density. Impacts on low- to moderate-quality

DT habitat will be mitigated to less than significant through implementation of avoidance, minimization, and mitigation measures.

Six WBOs, a CDFG Species of Special Concern, were detected within the Proposed Project BRSA. Two individuals were observed in the Project Disturbance Area. Three WBOs were detected within the Reconfigured Alternative BRSA. One individual was observed in the Reconfigured Alternative Disturbance Area.

Eight additional special status species were observed within the Proposed Project BRSA and the Reconfigured Alternative BRSA during 2009 and 2010 surveys: Mojave fringe-toed lizard (*Uma scoparia*); loggerhead shrike (*Lanius ludovicianus*); yellow warbler (*Dendroica petechia sonorana*), however, migratory only on site; ferruginous hawk (*Buteo regalis*), however, wintering only on site; northern harrier (*Circus cyaneus*), however, wintering only on site; Swainson's hawk (*Buteo swainsoni*), however, migratory only on site; American badger (*Taxidea taxus*); and desert kit fox (*Vulpes macrotis arsipus*). Impacts on non-listed special status wildlife species will be mitigated to less than significant through implementation of avoidance, minimization, and mitigation measures.

Local movement for wildlife across the Proposed Project Disturbance Area and Reconfigured Alternative Disturbance Area north of I-10 would be limited by the rerouted channels; habitat exists outside of both these Disturbance Areas that would facilitate movement around the site for species. Local movement would be reduced because the large facility footprint would contribute to fragmentation of a large and contiguous desert landscape. However, this impediment is not expected to have a significant adverse impact on movement and/or population dispersal of species, with the exception of DT, because similar desert habitat outside of the perimeter fence would likely provide adequate movement opportunities for foraging and dispersal. Impacts to local movement for DT will be mitigated to less than significant through implementation of avoidance, minimization, and mitigation measures.

No USFWS-designated critical habitat for any plant or wildlife species occurs in the BSPP under either the Proposed Project or Reconfigured Alternative.

This report addresses permanent, temporary, direct, and indirect impacts to biological resources. Based on analyses conducted to date, impacts on biological resources would be significant, but through implementation of avoidance, minimization, and mitigation measures would be reduced to below a level of significance for all species.

The multiple solar projects proposed on BLM land between 2010 and roughly 2014, based on currently available data, would develop approximately 20,000 acres of desert lands along the Interstate 10 (I-10) corridor. The large acreage assumed to be developed in each of the various projects would impact wildlife movement and fragment species populations. Since most of the projects are in the valleys and along the I-10 corridor, this could potentially reduce wildlife movement and impair gene flow among species populations. Through the project-specific environmental review process, these various projects would individually be required to mitigate their own impacts through measures such as providing suitable habitat at an agency agreed-upon ratio for the affected species to compensate for the habitat loss. The BSPP will fully mitigate impacts to biological resources. Therefore, the cumulative contribution of the Proposed Project would be less than considerable.

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CHAPTER 1
INTRODUCTION

The original Blythe Solar Power Project (BSPP) Biological Resources Technical Report (BRTR) (AECOM 2009a) describing spring 2009 survey results, appended to the Application for Certification (AFC), was submitted to the California Energy Commission (CEC) in August 2009. Subsequently, a BSPP Supplemental Biological Resources Survey Report (AECOM 2009b) was submitted in October 2009 to present fall 2009 survey results along the proposed transmission line route. After submittal of the AFC documents to the California Energy Commission (CEC) in 2009, an alternative site configuration was proposed for the BSPP solar facility. This "reconfigured alternative:" partly overlaps with the Proposed Project plant site as described in the AFC. Additionally, various design refinements were made related to potential transmission line routes and the substation area. This BRTR was developed to address these changes.

1.1 PROPOSED PROJECT AND RECONFIGURED ALTERNATIVE LOCATION

The Proposed Project and Reconfigured Alternative would be located in the southern California inland desert, approximately 8 miles west of the City of Blythe, the majority of which (the solar plants) would be located approximately 2 miles north of the Interstate 10 (I-10) corridor in Riverside County, California (Figure 1). The Proposed Project and Reconfigured Alternative are proposed on primarily undeveloped open space.

1.2 PROPOSED PROJECT AND RECONFIGURED ALTERNATIVE SITE

The Proposed Project and Reconfigured Alternative site is nearly completely vacant and undeveloped land is owned by the Federal government and administered by the Bureau of Land Management (BLM). There is a 160-acre private parcel in the center of the Project Disturbance Area that currently is not planned for use by the Proposed Project or Reconfigured Alternative. Another 160-acre parcel south of the Project Disturbance Area, but within the BRSA, is not planned for use by the Proposed Project or Reconfigured Alternative. There are no existing structures that would need to be demolished. The site is mostly flat, with elevation ranging on U.S. Geologic Survey (USGS) topographical maps from a high of about 670 feet above sea level at the southwestern limits of the site to a low of about 420 feet above mean sea level near the southeastern site boundary.

During World War II, the site was part of the General George S. Patton Desert Training Center, officially the California-Arizona Maneuver Area (CAMA), a simulated theater of operations. The site area was heavily used by tanks and other military vehicles. Nearby Blythe Airport was used as a CAMA training field. The 46th Bomb Group, and later the 34th Bomb Group, occupied nearby Blythe Airport, then known as Bishop Army Field, and flew training missions in a variety of military aircraft, including bombers.

1.3 PROPOSED PROJECT AND RECONFIGURED ALTERNATIVE DESCRIPTION

1.3.1 Proposed Project

The Applicant is proposing to construct the BSPP, a nominal 1,000-megawatt (MW) commercial solar thermal power-generating facility. The Proposed Project would be located on a 9,405-acre right-of-way (ROW) owned by the Federal government and administered by BLM. Use of the Federal land would involve issuance of an ROW grant to the Applicant by BLM. The total Project Disturbance Area would be 7,025 acres (Figure 2). The total Proposed Project Study Area is 7,614 acres (Figure 2). The Proposed Project would use solar parabolic trough technology to generate electricity. With this technology, arrays of parabolic mirrors collect heat energy from the sun and refocus the radiation on a receiver tube located at the focal point of the parabola. A heat transfer fluid (HTF) is heated to high temperature (approximately 750 degrees Fahrenheit [°F]) as it circulates through the receiver tubes. The heated HTF is then piped through a series of heat exchangers where it releases its stored heat to generate high-pressure steam. The steam is then fed to a traditional steam turbine generator where electricity is produced.

The Proposed Project would have a nominal output of 1,000 MW, consisting of four independent 250-MW power plants (Units #1, #2, #3, and #4) (Figure 3). The units would be developed in phases, with construction scheduled to begin in late 2010 on the first unit, which would come on line in mid-2013.

Each power block unit would have its own solar field, composed of piping loops arranged in parallel groups, and its own power block, centrally located within the solar field. Each power block would have its own HTF pumping and freeze-protection system, solar steam generator, steam turbine generator, air-cooled condenser for cooling, transmission lines and related electrical system, and auxiliary equipment (e.g., water treatment system, emergency generators, evaporation ponds). Major project components are identified below.

The BSPP would require a new transmission line. Transmission line features (e.g., crossing structures, pole pads, crane pads, pull sites, splice sites, spur roads, and an access road) would be located along an 8-mile transmission line corridor that extends to a point south of I-10 and then turns west (Figure 3). The transmission line and utility lines share the same corridor except where the transmission line jogs west on the north side of I-10 as shown in Figure 3. The transmission line will be connected to the new Colorado River substation that Southern California Edison (SCE) will be constructing as part of the strengthening and upgrading of its transmission network to support integration of renewable projects. Final placement and development of the substation would be the responsibility of the utility (i.e., SCE).

Access to the BSPP would be on a new road heading north from the frontage road along I-10. Only a small portion of the overall facility footprint would be paved, primarily the site access road, the service roads to the power blocks, and 6 acres of each of the 18-acre power blocks. The solar fields would remain unpaved and without a gravel surface to prevent mirror damage. The BSPP solar fields and support facilities perimeter would be secured with chain-link metal-fabric security fencing, controlled access gates, and 30-foot tall wind fences along the eastern and western boundaries.

Major Project Components

The major components and features of the Proposed Project (Figure 3) include:

- Solar Field and Power Block Unit #1 (northeast);
- Solar Field and Power Block Unit #2 (northwest);
- Solar Field and Power Block Unit #3 (southwest);
- Solar Field and Power Block Unit #4 (southeast);
- Access road including upgraded portion of Black Rock Road to onsite office;
- Office and parking;
- Land treatment unit (LTU) for bioremediation/land farming of HTF-contaminated soil;
- Warehouse/maintenance building, assembly hall, and laydown area;
- Onsite transmission facilities, including central internal switchyard;
- Natural gas pipeline;
- Telecommunications lines;
- Evaporation ponds;
- Dry wash rerouting; and
- Groundwater wells used for water supply.

Major components of each power block include:

- Steam generation heat exchangers;
- HTF overflow and expansion vessels;
- One auxiliary boiler;
- One steam turbine-generator (STG);
- One generator step up transformer (GSU);
- Air cooled condenser (ACC);
- One wet cooling tower for ancillary equipment;
- Water filter system and clarifier system;
- Combination firewater/clarified water tank;
- Potable water system;
- Demineralized water system;
- Demineralized water tank;
- High efficiency reverse osmosis (HERO) waste water recovery system;
- Recovered water surge tank;
- Evaporation waste stream pond(s);
- Water, natural gas, and HTF pipelines exiting the power block;
- Operations and maintenance buildings; and
- Transmission and telecommunications lines exiting the power block.

The Applicant has made various minor modifications to the BSPP since the AFC was submitted in August 2009. Some of these minor changes are not reflected in the March 2010 Staff Assessment/Draft Environmental Impact Statement (SA/DEIS) and reflect further definition of linear facilities and other changes required as a result of the Applicant's discussions with staff, other regulatory agencies, and the engineering team. New transmission line locations and associated buffers (as part of the Reconfigured Alternative discussed below) as well as additional locations added due to minor Proposed Project changes were surveyed in the spring of 2010 and are the included in the analysis of this report.

Changes to the Proposed Project were submitted to the CEC on April 19, 2010, and include:

- Removal of the four gas-fired HTF heaters (one per Unit) (within AFC Disturbance Area);
- Addition of an onsite concrete batch plant during construction (within AFC Disturbance Area);

- Addition of evaporation ponds to process industrial wastewater flows (within AFC Disturbance Area);
- Revision to construction water requirements, number of groundwater wells, and construction water storage approach (within AFC Disturbance Area);
- Finalization of the gen-tie line route to the SCE Colorado River Substation (portion of route outside of AFC Disturbance Area) (Figure 2);
- Clarification on the removal of the existing onsite (abandoned) natural gas pipeline;
- Changes to layout of Project facilities (within AFC Disturbance Area);
- Revisions to Project drainage system construction sequencing;
- Clarification on the paving of Black Rock Road (roadway section to be improved extends for a total length of approximately 3,500 feet; outside of AFC Disturbance Area);
- Addition of a temporary construction power line from offsite (outside of AFC Disturbance Area);
- Refinement of the daily construction schedule;
- Finalization of the telecommunications line (outside AFC Disturbance Area);
- Revised list of water treatment and hazardous materials chemicals; and
- Addition of an onsite fuel depot (within AFC Disturbance Area).

1.3.2 Reconfigured Alternative

At the request of the CEC, this report presents findings for the Reconfigured Alternative that was analyzed in the SA/DEIS. The Reconfigured Alternative would be a nominal 1,000-MW solar facility, similar to the Proposed Project. Three of the proposed solar power blocks (Units 1, 2, and 4) would remain at their proposed locations. These include the two northern solar fields and the southeastern solar field (Figure 4). Unit 3 (the southwestern solar field) would be relocated approximately 0.80 mile south of its proposed location (Figure 4). Approximately 480 acres of the Reconfigured Alternative (a portion of Unit 3) would be outside of the ROW application area, but the alternative would remain entirely within the BLM managed lands.

It is important to note that the Reconfigured Alternative is not a complete engineering design. The Reconfigured Alternative Disturbance Area provides sufficient area for construction of four solar power blocks (and the components outlined above) only. It does not include areas for access roads, staging, office and management facilities, staging area, land treatment unit, dry wash rerouting, water supply, or transmission lines. The Reconfigured Alternative Disturbance Area would be 5,548 acres. The Reconfigured Alternative Disturbance Area encompasses the disturbance caused by construction of the solar power blocks and solar fields only; it does not include shared facilities and linears.

Major Reconfigured Alternative Components

The major components and features of the proposed Reconfigured Alternative include:

- Solar Field and Power Block Unit #1 (northeast);
- Solar Field and Power Block Unit #2 (northwest);
- Solar Field and Power Block Unit #3 (southwest); and
- Solar Field and Power Block Unit #4 (southeast).

Most of the Reconfigured Alternative overlaps with the Proposed Project and was surveyed during 2009. Unsurveyed portions of the Reconfigured Alternative were surveyed in spring 2010 and are included in the analysis of this BRTR.

CHAPTER 2
METHODOLOGY

This section describes the methodologies, protocols, and limitations for the various plant and wildlife surveys conducted for the BSPP during spring 2010. The original BSPP BRTR (EDAW 2009a), appended to the AFC, describes the biological resources survey approach and survey protocols used for spring 2009. The BSPP Supplemental Biological Resources Survey Report (AECOM 2009b) describes the biological resources survey approach and survey protocols used for fall 2009.

For the purposes of this report, species are considered to have special status if they meet at least one of the following criteria:

- Covered under the Federal or California Endangered Species Act (ESA and CESA, respectively) (CDFG 2009);
- California Department of Fish and Game (CDFG) Species of Special Concern (SSC) (CDFG 2009);
- CDFG fully protected species (CDFG 2009);
- BLM sensitive species (BLM Sensitive) (BLM 2009);
- Covered as a State protected furbearing mammal (PFM) (California Code of Regulations [14 CCR Section 460]);
- Listed by the California Native Plant Society (CNPS) as List 1A (presumed extinct in California), 1B (rare, threatened, and endangered in California and elsewhere), or 2 (rare, threatened, or endangered in California, but more common elsewhere). CNPS List 1A, 1B, and 2 species are considered special status plant species if they fall within any of these categories as defined in the Native Plant Protection Act, California Fish and Game Code (CFGC) Section 1901 or the CESA, CFGC Sections 2050 through 2098 (CESA).
- CNPS List 3: (plants for which more information is needed [a review list]), or List 4 (plants of limited distribution [watch list]) (CNPS 2009).
- Locally significant species, covered under the Northern and Eastern Colorado Desert Coordinated Management Plan (NECO) (BLM 2002) or the West Mojave Plan (WEMO) (BLM 2005).

Prior to beginning field surveys in 2010, AECOM biologists updated the CDFG California Natural Diversity Database (CNDDB) (RareFind Version 3.1.0; CDFG 2010) records search that was conducted in 2009 This consisted of a 16-quad CNDDB search including the four USGS quadrangles occupied by the Combined Survey Area and a surrounding 12-quad buffer. CNDDB occurrences of special status plant and wildlife species and other natural resources within the Biological Resources Survey Area (BRSA) are shown in Figure 5.

2.1 BIOLOGICAL RESOURCES SURVEY APPROACH

After submittal of the AFC documents to the CEC in 2009, an alternative site configuration was proposed for the BSPP. Additionally, various design refinements were made related to potential transmission line routes and the substation area. As a result of design changes and development of an alternative, additional biological resource technical surveys were necessary in 2010 to fill in the survey gaps in support of the BSPP review, approval, and permitting. The following biological resource surveys were conducted at the Proposed Project and Reconfigured Alternative BRSAs during the 2010 survey season: desert tortoise (*Gopherus agassizii*; DT) survey, Western burrowing owl (*Athene cunicularia hypugaea*; WBO), golden eagle (*Aquila chrysaetos* [GOEA]) nest surveys, botanical survey (vegetation community mapping and rare plant surveys), and jurisdictional waters delineation. GOEA nest surveys are ongoing as of production of this BRTR and final results will be presented in an addendum to this report.

All protocols to be implemented in 2010, and described herein, are consistent with 2009 survey protocols, with the exception of a few modifications to the DT protocol, rare plant surveys, and jurisdictional waters surveys. DT protocol surveys for 2010 were initiated earlier than in 2009, and earlier than specified in established protocols on account of above-average rainfall and early warm temperatures in the region (with the USFWS concurrence; see Section 2.2.5, “Desert Tortoise Protocol” below). Botanical surveys in 2010 addressed additional special-status plant species not previously included in 2009 surveys (see Section 2.2.3, “Botanical Surveys” below). The jurisdictional waters delineation in 2010 included surveys of the Proposed Project and Reconfigured Alternative Disturbance Areas and associated 250-foot buffers not included in the 2009 surveys (see Section 2.2.2, “Jurisdictional Waters Delineation” below). Avian point count surveys were not repeated in 2010 per BLM guidance (LaPre 2010).

In general, 2010 surveys at the BSPP occurred within areas that were not previously surveyed in 2009 in: 1) the Proposed Project Study Area (based on footprint refinements); 2) Proposed Project Study Area buffer zones; 3) Reconfigured Alternative Disturbance Area; and 4)

Reconfigured Alternative Disturbance Area buffer zones. A list of all field biologists who completed surveys and their qualifications is included in Attachment B.

2.2 BIOLOGICAL RESOURCES SURVEY PROTOCOLS

This section identifies the specific locations in which biological resource surveys were completed (Figures 6 and 7), and describes the detailed survey methodologies (i.e., protocols) that were implemented in 2010. Survey methodologies described below apply to all 2010 survey areas (i.e., Proposed Project and Reconfigured Alternative Disturbance Areas not included in the 2009 surveys)

2.2.1 Vegetation Mapping

Vegetation community mapping occurred within portions of the Combined Survey Area that either were not previously surveyed or needed to be resurveyed using a smaller minimum mapping unit (MMU) (i.e., buffer areas in 2009 that became Disturbance Areas in 2010 required more detailed mapping). Field biologists used orthotopographic maps at a scale of 1 inch equals 700 feet for vegetation mapping. Vegetation communities have been classified according to Holland (1986). Sawyer and Keeler-Wolf (1995) and CDFG (2003) classifications were also used to provide additional detail where appropriate, such as denoting special or sensitive vegetation communities that are either known or believed to be of high priority for inventory in the CNDDB due to their distinctive nature, limited distribution (i.e., rarity), or importance for special status wildlife species.

Project botanists consulted with regional experts including Andrew Sanders (of the University of California at Riverside [UCR] Herbarium) and David Silverman (of Xeric Specialties Consulting) to conclude that intuitive controlled surveys per Whiteaker et al. (1998) are sufficient for documenting a complete floral inventory on site (including the target special status plant species). The Whiteaker (1998) method is the BLM-approved method for conducting botanical surveys. Surveyors conducted vegetation mapping within the Proposed Project Study Area and Reconfigured Alternative Disturbance Area by walking meandering transects; transect spacing was dynamic based on habitat complexity and topography, and was close enough to allow visual coverage of vegetation signatures at the MMU within the Proposed Project Study Area and Reconfigured Alternative Disturbance Area (0.01 acre for riparian areas and 1.0 acre for all other cover types).

Within the buffer areas, the MMU for all land cover types, including riparian, was 1.0 acre. Vegetation mapping within the Proposed Project or Reconfigured Alternative buffer areas was therefore conducted by walking transects within native habitat that were spaced wider than those walked within Disturbance Areas but allowed visual coverage of vegetation signatures 1.0 acre in size or larger. Developed land and agricultural areas were surveyed by a combination of walking transects and selecting key vantage points from existing dirt access roads.

In areas where the aerial imagery was difficult to discern (e.g., the edge of a stabilized dune formation with sandy soils), Global Positioning System (GPS) points were recorded with habitat notes and photos as appropriate to assist with office-based, post-field verification of vegetation polygons delineated in the field.

Dominant plant species present within each riparian and upland vegetation community mapped on site were recorded according to the 50/20 dominance rule (Environmental Laboratory 1987). According to this rule, dominant plant species are defined as those that, when ranked in order of abundance, collectively make up 50 percent relative cover. Each dominant species individually makes up at least 20 percent relative cover or is needed to surpass the 50 percent relative cover threshold. Once the dominant plant species are identified according to this method, they will be grouped according to relative cover: species below 20 percent cover, species ranging from 20 to 50 percent cover, and species exceeding 50 percent cover.

Vegetation mapping was conducted concurrently with rare plant surveys, so all rare plant observations were accurately delineated using GPS equipment at the time of first observation (refer to rare plant survey methods below for more detail).

Additionally, a description of each vegetation community mapped on site was recorded including the extent of disturbance, presence of special soils, potential jurisdictional waters, and habitat suitability for rare plant species. Invasive species listed by the California Invasive Plant Council (Cal-IPC) as A-1, A-2, and B status species (Cal-IPC 2010) were noted when occurring in high concentrations (approximately 100 square feet and larger) and in nearly monotypic stands. Potential invasive plant species that were expected to be encountered during 2010 surveys on the Project site include tamarisk (*Tamarix* spp.), Saharan mustard (*Brassica tournefortii*), Mediterranean grass (*Schismus* sp.), red brome (*Bromus madritensis*), and cheat grass (*Bromus tectorum*).

Additional Discussion of Sensitive Vegetation Communities

Vegetation communities and other land cover types classified as "sensitive" within this report were determined by applying the following regulatory context. Guidance for determining sensitive vegetation communities is provided by resource agencies including BLM, CDFG, and CNPS, as well as supporting documentation such as the CNDDB. These Federal, State, and local agencies and related publications typically are in concurrence on the classification of sensitive vegetation communities and other land cover types. For example, vegetation communities or other cover types that are coincident with jurisdictional waters will typically be considered sensitive. For the BSPP, these waters are regulated by Sections 1600 et seq. of the CFGC. Additionally, the occurrence of suitable habitat for special status plant and animal species also raises the sensitivity of a vegetation community. Biologically, the vegetation communities that provide the highest habitat values within the Combined Survey Area are the riparian communities associated with the desert washes.

2.2.2 Jurisdictional Waters Delineation

A formal delineation for potential jurisdictional waters of the United States and of the State was conducted within the Desert Aquatic Resources Survey Area (DARSA). The DARSA includes the Proposed Project Disturbance Area, Reconfigured Alternative Disturbance Area, and associated 250-foot buffers. The DARSA includes areas surveyed in 2009 (Figures 6 and 7). Additionally a qualitative functions and values assessment for ambient conditions and projected post-project conditions of these areas was also performed (see below).

Field delineation within the Proposed Project DARSA during the March 2009 surveys involved two field teams, each with two ecologists. Field delineation within the Proposed Project DARSA during the October 2009 survey involved one ecologist. Field delineation within the Proposed Project DARSA during the November 2009 field surveys involved two ecologists. Field delineation within the Reconfigured Alternative DARSA and transmission line and substation areas during the April 2010 field surveys involved two ecologists. Supplemental field delineations were conducted in response to a field verification meeting with CDFG, CEC, and BLM on November 3, 2009, at the Proposed Project DARSA and a request by the CEC to provide analysis for the Reconfigured Alternative design. Teams and individuals recorded the presence (including extents, types, and boundaries) of potential jurisdictional features with two Trimble XH subfoot accuracy GPS hand-held units (or one GPS unit per two-person team). At the close of each field day, all acquired field data were submitted via the internet to AECOM San Diego's Geographic Information Systems (GIS) specialists for post-field processing using Trimble GPS Analyst (Version 2.1) GIS software. Post-field analysis to code, define, designate, and edit all acquired

GPS field data representing jurisdictional waters occurring within the DARSA was conducted in tandem with an AECOM GIS specialist and the ecologists who performed the fieldwork.

Formal Delineations for Potential Jurisdictional Waters of the United States

Jurisdictional waters of the United States are defined in 33 CFR 328 (Definition of Waters of the United States). The DARSA has the potential for the presence of, at a minimum, two types of federally regulated waters, warranting the following:

1. Formal delineation of waters of the United States in the form of wetlands based on the three-parameter method. The three-parameter method for identifying and delineating wetlands is outlined in and in accordance with Federal guidance and procedure following the *Corps of Engineers Wetlands Delineation Manual* (Manual) (Environmental Laboratory 1987) and the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region* (Version 2.0) (2008 Supplement) (Environmental Laboratory 2008).
2. Formal delineations of other non-wetland waters of the United States to define and identify the jurisdictional lateral extent of non-wetland waters using field indicators of ordinary high water mark (OHWM) as defined by 33 CFR 238.3(e), Federal guidance and procedures outlined in *A Field Guide to the Identification of the Ordinary High Water Mark (OHWM) in the Arid West Region of the Western United States: A Delineation Manual* (Lichvar and McColley 2008), *Distribution of Ordinary High Water Mark (OHWM) indicators and their reliability in identifying the limits of "Waters of the United States" in arid southwestern channels* (Lichvar et al. 2006), and other relevant Federal guidance and procedural documents (see below).

This jurisdictional delineation applied two field methodologies in delineating potential jurisdictional waters of the United States as described below. All potential waters of the United States were delineated to their jurisdictional limits as defined by 33 CFR 328.4 (Limits of jurisdiction).

Formal Delineations for Potential Jurisdictional Waters of the State

Under Section 1600 *et seq*. of the CFGC, CDFG regulates activities that would alter the flow, bed, channel, or bank of streams and lakes. The limits of CDFG jurisdiction are defined in CFGC Section 1600 *et seq*. as the "bed, channel or bank of any river, stream or lake designated by the department in which there is at any time an existing fish or wildlife resource or from which these

resources derive benefit."[1] However, in practice, CDFG usually extends its jurisdictional limit and assertion to the top of a bank of a stream, the bank of a lake, or outer edge of the riparian vegetation, whichever is wider.

Under Section 13000 *et seq*. of the Clean Water Code (CWC), the Regional Water Quality Control Board (RWQCB) is authorized to regulate activity that would result in discharges of waste and fill material to waters of the State. In practice, RWQCB usually extends its jurisdictional limit to waters of the States (as defined by CWC Section 13050[e]) which support or present beneficial uses, once beneficial uses are designated within a regional Basin Plan.

Boundaries for xeric riparian waters of the State were determined (and recorded) by the presence of shelving and/or scour resulting in an established bank, bed, and channel of an ephemeral wash feature and its associated riparian areas (where applicable). In specific areas within the ephemeral wash channels, where evidence of shelving or scour was absent, subsurface investigations were undertaken to identify established channel banks. Although some portions of the ephemeral washes present shelving with smooth-toe transitions, these features are composed of friable sand and are evidence of recent sand deposition (likely from wind erosion and aeolian saltation) covering the bank features. Swale features did not meet the definition of established bed and bank or as a stream feature as defined in the CFGC Section 1600 *et seq*. and Title 14 CCR 1.72 and are therefore not considered as jurisdictional waters of the state in this JDR.

For wetlands and other aquatic habitats occurring in California, CDFG relies on the USFWS wetland definition and classification system, which is based on *Classification of Wetland and Deepwater Habitats of the United States* (Cowardin et al. 1979). Therefore, jurisdictional wetland delineations within the DARSA area have been conducted based on the one-parameter[2] method outlined in CDFG/USFWS guidance documents and classification manual(s) to define presence and State jurisdictional extent. The Cowardin method requires diligence to avoid false positive conclusions (e.g., concluding that an area with no transitional relation to the aquatic system is a wetland based on presence of vegetation equally likely to be found in wetland or nonwetland circumstances).[3]

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[1] The California Code of Regulations (Title 14 CCR 1.72) defines a stream as: "…a body of water that flows at least periodically or intermittently through a bed or channel having banks and supports fish or other aquatic life. This includes watercourses having a surface or subsurface flow that supports or has supported riparian vegetation."

[2] For Federal jurisdictional waters, a determination for the presence of wetland is based on the presence of three parameters occurring simultaneously at the area of investigation and study. These three wetland parameters are 1) hydrophytic vegetation, 2) hydric soils, and 3) wetland hydrology. For State-defined wetlands, only one of these three wetland criteria is required to be present for the State to consider an aquatic feature a wetland.

[3] Although aquatic features can be delineated and defined as wetlands under the Cowardin Classification System, they are not necessarily *jurisdictional* waters of the United States or State.

Based on the CFGC Section 1600 *et seq*. definition, CDFG regulatory practice, and corresponding field guidance, specific to the DARSA, provided on site by CDFG and CEC on November 3, 2009 (AECOM 2009a), field diagnostic features were used to determine and delineate the presence of two types of jurisdictional waters of the State, which collectively and individually represent the jurisdictional extent, occurring within the DARSA:

1. Desert Dry Wash Woodland, and
2. Unvegetated Ephemeral Dry Wash.

In addition, a special community type consisting of Vegetated Swales supporting Creosote Bush – Big Galleta Grass Association has been delineated within the DARSA. These vegetated swales are not considered jurisdictional waters of the State in accordance with the definition of waters in the California Fish and Game Code; however, CDFG is asserting jurisdiction over these features.

Qualitative Functions and Values Assessment

A qualitative assessment of the functions and services of the ephemeral stream features (composed of two types of aquatic features [e.g., desert dry wash woodland and unvegetated ephemeral dry wash]) and vegetated swales supporting desert dry wash-dependent (or desert dry wash-obligate) species potentially directly and indirectly impacted by the proposed BSPP were evaluated as riverine.[4] Although the vegetated desert aquatic features and swales are not populated by hydrophytic plant species they are populated by ephemeral wash obligate plant species that can be considered to provide functions and values as wetland within an arid or semi-arid landscape (Lichvar and Field 2007).[5]

Wetland (or in this case xeric riparian) functions can be defined as the physical, chemical, and biological processes occurring in and making up an ecosystem (Mitsch and Gosselink 2007) and a process or series of processes that take place within a wetland (USGS 1996). Wetland values can be defined as the goods and services perceived as beneficial or valuable to society that emanate directly or indirectly from wetland functions (Batzer and Sharitz [eds.] 2006) and "an estimate, usually subjective, of worth, merit, quality, or importance" to people (Richardson 1994).

[4] "Riverine" refers to a class of wetland that has a floodplain or riparian geomorphic setting [Brinson et al. 1995]).

[5] Ephemeral streams are the predominant fluvial environment in arid and semiarid regions and current understanding of dryland riparian ecology is derived primarily from perennial stream environments (Shaw and Cooper 2008).

This qualitative assessment of xeric riparian functions and values used the Hydrogeomorphic Approach (HGM) to assess the physical, chemical, and biological functions and values of desert dry wash woodland, unvegetated ephemeral dry wash, and vegetated swales supporting wash dependent vegetation using a synthesis of the methodologies and definitions outlined in:

1. *A Hydrogeomorphic Classification for Wetlands* as a guide (Brinson 1993)
2. *An Approach for Assessing Wetland Functions Using Hydrogeomorphic Classification, Reference Wetlands, and Functional Indices* (Smith et al. 1995).
3. *Wetland Values: Concepts and Methods for Wetlands Evaluation* (USACE 1979).
4. *The Ecological and Hydrological Significance of Ephemeral and Intermittent Streams in the Arid and Semi-arid American Southwest* (USEPA 2008).
5. U.S. Environmental Protection Agency (USEPA) Watershed Academy: *Wetland Functions and Values* (USEPA 2009).
6. USGS Water Supply Paper 2425: *Wetland Functions, Values, and Assessment* (USGS 1996).

This qualitative functions and values assessment is based on observations made during the jurisdictional delineation field surveys and other resource surveys (e.g., cultural, botanical, and wildlife). This assessment is intended to quantitatively evaluate desert aquatic features without a reference site. Since this assessment is not based on a comparison to an actual reference site in the field, the qualitative ranking of variables used for the assessment of the quality of functions and values was confined to the quality of the habitats within the DARSA. Ephemeral steam functions are summarized below in Table 1 and ephemeral stream values are summarized below in Table 2. The following text explains these conclusions.

Table 1
Ephemeral Stream Functions and Functional Status of Established washes and Ancillary Ephemeral Drainage Features[a]

Function	Functional Status for Vegetated Ephemeral Dry Wash	Functional Status for Unvegetated Ephemeral Dry Wash	Functional Status for Wash-Dependent Vegetated Swales
Hydrologic Function	High	High	Medium to High
Biogeochemical Function	High	Medium to Low	Medium to High
Plant Habitat Function	High	Medium to Low	Medium to High
Animal Habitat Function	High	Medium to High	Medium to Low

[a] Qualitative criteria used to determine High, Medium, or Low functional status.
High – Ephemeral stream and/or swale is functioning at a high level and represents the top 25 percent of its class.
Medium – Ephemeral stream and/or swale is functioning but due to site-specific factors and/or disturbance is not functioning at potential functional capacity.
Low – Ephemeral stream and/or swale is providing some functions, but due to landscape context and/or past disturbances is functioning well below potential functional capacity.

Table 2
Ephemeral Stream Values and Value Status of the Established washes and Ancillary Ephemeral Drainage Features [a]

Value	Value Status for Vegetated Ephemeral Dry Wash	Value Status for Unvegetated Ephemeral Dry Wash	Value Status for Wash- Dependent Vegetated Swales
Aquifer Recharge/ Water Supply	High	High	Low
Flood Protection	Low	Low	Low
Water Quality	High	High	Medium to High
Economic	Medium to Low	Low	Low
Aesthetic	High	Medium to High	Medium to Low
Recreational	Medium	Medium	Low
Cultural	Medium to Low	Medium to Low	Medium to Low
Habitat	High	Medium	Medium

[a] Qualitative criteria used to determine High, Medium, or Low functional status.
High – Ephemeral stream and/or swale provides recognizable values accepted as important or priority driven for people.
Medium – Ephemeral stream and/or swale provides recognizable values due to site-specific factors; however, values are not considered as important or a priority for people.
Low – Ephemeral stream and/or swale are providing some values, but due to inherent low functions and/or past disturbances values are considered low by people.

Using Brinson (1993), Smith et al. (1995), and USEPA (2008) as the primary guidance documents for assessing xeric riparian function, the qualitative HGM assessment for the riverine system occurring within the DARSA will be identified by four major functional categories:

1. Hydrologic Function,
2. Biogeochemical Function,
3. Plant Habitat Function, and
4. Animal Habitat Function.

The xeric riparian values 1 through 4 will be incorporated within the xeric riparian functions because wetland values also arise from the many ecological functions associated with wetlands (USEPA 2009). Using USEPA (2009), USGS (1996), and USACE (1979) as the primary guidance documents, xeric riparian values for the riverine system occurring within the DARSA will be identified by seven major value categories:

1. Aquifer Recharge (including Base Flow and Water Supply),
2. Flood Protection,
3. Water Quality,
4. Economic,
5. Aesthetic,

6. Recreational, and
7. Cultural.

Xeric riparian values 5 through 7 were ascertained through subjective review during the jurisdictional delineation field assessment, a review of related documents such as cultural resources reports (EDAW 2009b), the Riverside County General Plan (Riverside County 2003), the City of Blythe Municipal Code (City of Blythe 2008), and speaking with resource agency personnel (AECOM 2009e).

2.2.3 Rare Plant Surveys

Rare plant surveys occurred within the portions of the Combined Survey Area that either were not previously surveyed or were necessary to comply with the December 2009 CEC data request for consideration of 15 additional special status plant species and detailed mapping of ribbed cryptantha (*Cryptantha costata*). Botanical surveys were initiated on the BSPP site on March 8, 2010, and continued through May 11, 2010. The botanical survey areas for the Proposed Project and Reconfigured Alternative are shown in Figures 6 and 7.

Rare plant surveys followed survey guidelines from the following resources: 1) *Guidelines for Conducting and Reporting Botanical Inventories for Federally Listed, Proposed, and Candidate Plants* (USFWS 2000); 2) *Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Natural Communities* (CDFG 2009)[6]; 3) *CNPS Botanical Survey Guidelines* (CNPS 2001); and 4) *Survey Protocols for Survey and Manage Strategy 2: Vascular Plants* (Whiteaker et al. 1998).

Past botanical technical reports and agency letters relevant to the Combined Survey Area were consulted when considering the species with potential to occur on site (CH2MHill 2008; AECOM 2009a, 2009b; USFWS 2009a). At the direction of BLM, any varieties of California barrel cactus (*Ferocactus cylindraceus* var. *cylindraceus*), cottontop cactus (*Echinocactus polycephalus* var. *polycephalus*), and hedgehog cactus (*Echinocereus* spp.) encountered on site were also recorded and mapped during rare plant surveys (LaPre 2009). Additionally, the portion of the Combined Survey Area that was previously surveyed in 2009 was revisited systematically to comply with the December 2009 CEC data request for consideration of 15 additional special status plant species and detailed mapping of ribbed cryptantha.

[6] This document replaced the CDFG document *Guidelines for Assessing the Effects of Proposed Projects on Rare, Threatened and Endangered Plants and Natural Communities*.

Rare plant surveys were “intuitive controlled” (per Whiteaker et al. 1998). The surveys were conducted by walking transects placed systematically throughout the Combined Survey Area while searching for target plant species and suitable habitats. In portions of the Project Disturbance Area and Reconfigured Alternative Disturbance Area not previously surveyed during 2009, botanists traversed all representative habitats, providing complete visual coverage in areas determined suitable for target plant species (including microhabitats—small patches of suitable habitat that are smaller than 0.1 acre in size, and are surrounded by unsuitable habitat). This required closely spaced transects in the desert washes, incised channels, and sandy dune habitats (50–100 feet, possibly less depending on topographic complexity) and allowed wider spacing in the flat creosote bush scrub and desert pavement (approximately 100–200 feet, or more depending on visibility). Transects followed topographic relief rather than predefined survey grids, for the purpose of providing focused coverage of the desert washes.

In the Combined Survey Area buffers, suitable habitats associated with the major desert washes or sandy dune habitats were surveyed with complete visual coverage but the areas were not resurveyed with the same rigor as the Disturbance Areas.

Suitable habitats were determined based on geography, slope aspect, soil substrate, vegetation community, associated plant species, and familiarity with each species based on reference populations and historical surveys conducted in the region. Unsuitable habitats were traversed while traveling between areas of suitable habitat, providing partial survey coverage in these areas. Each field botanist carried a GPS to record their path through the Combined Survey Area each day.

The exception to the “intuitive controlled” method described above would have been with respect to the Coachella Valley milkvetch surveys. This federally endangered plant species must receive more focused attention in areas of suitable habitat where the species has potential to occur, based on USFWS requirements. Project Biologist Andrew Sanders (of the UCR Herbarium) has determined that Coachella Valley milkvetch is not currently documented outside of the Coachella Valley area. To reach this conclusion, Mr. Sanders thoroughly reviewed the vouchered collections (identified as Coachella Valley milkvetch) from the Desert Center area (Dice 980324-2; Dice 980324-3; and Sears 1173) and other collection data (e.g., http://ucjeps.berkeley.edu/consortium/ and UCR herbaria specimens). After careful consideration, Mr. Sanders found the Desert Center collections (i.e., all Coachella Valley milkvetch collections outside the Coachella Valley) to be *Astragalus lentiginosus* var. *variabilis* rather than *A. lentiginosus* var. *coachellae*.

Therefore, focused surveys for Coachella Valley milkvetch were not applicable to the BSPP botanical surveys, and field observations during the 2010 survey season corroborated the findings of Andrew Sanders. A letter from Mr. Sanders is provided as Attachment C.

The timing of rare plant surveys was based on the most phenologically appropriate time for each target plant species; surveys occurred when reproductive structures (i.e., flowers and fruits) and distinctive leafy parts were present and easily identifiable. When possible, known locations of rare plants in the vicinity of the Project site were visited to verify the status of these species during the 2010 growing season (germinating, flowering, seeding, etc.). When reference site visits were not possible, specimens from the UCR Herbarium were studied to inform field biologists of important keying characters (Attachment C).

In general, the ideal survey window for spring 2010 was closely associated with the rainfall pattern, considering both rainfall totals and the timing of precipitation. Additional surveys occurred as many times as necessary to ensure the blooming periods of all target rare plant species were covered.[7] Areas containing rare plants were visited at least twice during the survey season and all observed species were identifiable during these visits. The substation area was revisited during 4 separate weeks to ensure the *Cryptantha* and *Eriastrum* were properly identified, as the *Cryptantha* can be difficult to distinguish and the *Eriastrum* species bloom later than other species within the Combined Survey Area. Areas with desert pavement, high disturbance, and/or little species diversity were only visited once.

During spring rare plant surveys, each field botanist recorded a complete floral inventory, including the phenology(ies) observed (to document the blooming period and calibrate the timing of additional surveys). All plant species observed during the rare plant surveys are provided as Attachment C.

Plant nomenclature follows that of *The Jepson Desert Manual* (Baldwin et al. 2002). Additionally, scientific names are used in all records to avoid confusion between taxa. Time was allotted as necessary to confirm the identity of unknown species to the taxonomic level necessary to determine identification and sensitivity.

[7] In DR-BIO-81 of the AECOM Response to the CEC Data Request (December 2009), AECOM proposed that biologists would walk 10- to 20-meter parallel transects within all habitats of the disturbance areas, regardless of habitat suitability. After further consideration of the terrain within the Combined Survey Area, this approach was revised; habitat complexity dictated how far each botanist was able to see and therefore dictated the necessary spacing. AECOM botanists have consulted with regional experts including Andrew Sanders (of the UCR Herbarium) and David Silverman (of Xeric Specialties Consulting) to conclude that intuitive controlled surveys per Whiteaker et al. 1998 are sufficient for documenting a complete floral inventory on site (including the target special status plant species).

If a target rare plant population was located, the population was assessed for vigor and potential existing threats (e.g., off-road vehicle activity and invasive plants) and the number of individuals were counted (or subsampled and population size estimated in the event of large populations). All sensitive plant locations identified were recorded directly with submeter handheld GPS units and were subsequently mapped on aerial photo-based field maps (700-foot scale orthotopographic maps). Rare plant detections are mapped either as individual point locations (for single plants or small clusters of plants) or as occupied polygons (for large, continuous populations of plants).

In addition to mapping special status species occurrences, suitable habitat for the target species was assessed and mapped. In many cases, not enough information is known about microhabitat preferences of a species to define its habitat beyond the level of vegetation communities.

Following submittal of this report, CNDDB forms will be completed and submitted to CDFG (as publically available data) for all special status plant species observed. Voucher specimens of special status plant species were collected if it was determined that such collection would not jeopardize the existing population. These collections were submitted to the UCR Herbarium through Andrew Sanders.

Additional Survey Considerations

During vegetation mapping and rare plant surveys, field botanists were prepared to document any observations of creosote bush rings (none were discovered).

Regional experts were consulted for guidance through all phases of survey work for concurrence with the methods employed by AECOM survey teams. This includes botanists such as David Silverman (of Xeric Specialties Consulting) and Andrew Sanders. These experts received copies of this methodology and provided approval prior to field surveys; once in the field, they trained crews on species identification, conducted expert habitat assessments, and provided guidance on optimal survey timing for the targeted special status plant species.

2.2.4 General Biological Survey Details

General wildlife surveys were conducted concurrently with protocol wildlife surveys and vegetation mapping to document all wildlife species observed and to assess the suitability of the Combined Survey Area to support special status wildlife species. Wildlife sign and sightings were recorded and special status species were mapped using GPS units. Additionally, as

requested by the CEC, project biologists mapped potential areas that may pond following rainstorms in order to assess the potential of Couch's spadefoot (*Scaphiopus couchii*) to occur within the Combined Survey Area. This mapping only occurred within areas surveyed during spring 2010 and preliminary data were presented to the CEC. Within this report, these potential areas that may pond are only presented in the context of assessing potential for the species to occur within the Combined Survey Area and are not presented in results or impacts discussion since it is unknown if the species occurs in the Combined Survey Area.

2.2.5 Desert Tortoise Protocol

DT protocols implemented in 2010, and described herein, are consistent with 2009 survey protocols (AECOM 2010a), with the exception of a few modifications. DT surveys included a combination of presence-or-absence surveys (i.e., 100 percent coverage surveys), and additional transect-based sign surveys within the project buffer zone. Project biologists Shelly Dayman, Art Davenport, Brooks Hart, and Gregg Lukasek conducted habitat assessments on February 17, 2010. All areas to be surveyed in 2010 were determined to contain suitable habitat for DT (the only areas containing habitat not suitable for DT were within the buffer areas).

DT presence-or-absence surveys occurred in suitable habitat in 2010 survey areas within the Combined Survey Area. Presence-or-absence surveys (100 percent coverage surveys) for DT during 2010 followed the guidelines published in the 1992 USFWS survey protocol (USFWS 1992), with the following exception: no surveys of the five zone of influence (ZOI) transects that are typically required outside of and parallel to the Proposed Project Study Area and Reconfigured Alternative Disturbance Area at 100, 300, 600, 1,200, and 2,400 feet were conducted. Use of the USFWS 1992 protocol with the exception of ZOI transects, rather than the revised 2009 protocol (USFWS 2009), was agreed upon by USFWS, CDFG, BLM, and CEC in 2009 prior to survey initiation per an email communication dated March 10, 2009, from Julie Vance of CDFG (refer to Section 2.2.1 of the AFC (EDAW 2009e).

In accordance with the 1992 USFWS protocol, previously unsurveyed portions of the Combined Survey Area were surveyed using transects spaced approximately 30 feet apart along transects oriented north to south or along transects that were parallel to the edges of the Proposed Project Study Area and Reconfigured Alternative Disturbance Area. The survey was conducted by slowly and systematically walking linear transects while surveyors visually searched for DT and sign. Particular emphasis was placed on searching around the bases of shrubs and along the banks of shallow washes. All types of DT sign (live tortoises, shells, bones, scutes, limbs, scat, burrows, pallets, tracks, egg shell fragments, drinking sites, etc.) were recorded using a GPS unit.

If vegetation or topography reduced the surveyor's ability to see DT sign, the spacing between survey transects was reduced, as necessary. This occurred in areas with high vegetation density or where topography obscured the surveyor's ability to see DT sign.

DT presence-or-absence surveys were initiated on March 15, 2010 (with wildlife agency approval; see discussion below) at the BSPP site; at that time mean daily temperatures had reached a minimum of approximately 65°F, adequate annual forage was available for DTs, and evidence of DT activity was observed on the BSPP. The proposal to initiate presence-or-absence surveys at the BSPP site earlier than the March 25 to May 31 survey period, as stated in the USFWS 1992 protocol, or the April through May survey period as stated in the USFWS 2009 protocol (USFWS 2009b), was presented in a letter to Pete Sorenson at USFWS (dated March 2, 2010) with subsequent USFWS concurrence via email from Pete Sorenson on March 16, 2010 (Attachment 2 in May 2010 DT Report; Attachment D).

To comply with the recommendations of the draft CEC *Recommended Biological Resources Field Survey Guidelines for Large Solar Projects* (CEC 2007), buffer transects outside of and parallel to the Proposed Project Study Area (Figure 6) and Reconfigured Alternative Disturbance Area (Figure 7) were also surveyed for DT and their sign. These CEC-required buffer transects were placed at 3,960 feet (0.75 mile) and 5,280 feet (1 mile) from and parallel to the edge of nonlinear portions of Proposed Project Study Area and Reconfigured Alternative Disturbance Area as well as at 1,000 feet from the edge of linear portions of Proposed Project Study Area and Reconfigured Alternative Disturbance Areas (e.g., transmission line) (Figures 6 and 7). The Reconfigured Alternative buffer transects and the Proposed Project buffer transects associated with the linear features and substation are shown in Figures 6 and 7. Surveys along buffer transects were conducted in a similar fashion to the transects described for presence-or-absence surveys in the Project Disturbance Area and Reconfigured Alternative Disturbance Area, by slowly and systematically walking linear transects while surveyors visually search for DT, their sign, or other special status species and their sign. Particular emphasis was placed on searching around the bases of shrubs and along the banks of shallow washes. These transects were more broadly focused than the DT presence-or-absence protocol transects, described above, and are not a part of the 1992 USFWS DT protocol requirements. However, they provide additional information on DT occurrence and habitat suitability as well as other biological resources in the area surrounding the Proposed Project Study Area or Reconfigured Alternative Disturbance Area.

Presence/absence and buffer transect surveys for DT were completed between March 15 and May 14, 2010. Project biologists included Michael Anguiano, Rocky Brown, Art Davenport,

Shelly Dayman, Kim Fiehler, Charles German, Donna Germann, Brooks Hart, Rebecca Koller, Gregg Lukasek, Mike Rathbun, Milo Rivera, Russ Smith, Dana Terry, and Wayne Vogler.

Any DTs observed were measured at middle carapace length (MCL) and evaluated for health. Photographs of DT observations were taken when possible (e.g., animal not deep in burrow). Photographs of large carcasses and/or unusual sign were also taken. Burrows, scat, and shell remains were classed using the Information Index for Desert Tortoise Sign: Burrows and Dens, Scats and Shell Remains as in the USFWS protocol (USFWS 1992).

After completion of presence-or-absence surveys, results were used to calculate estimated adult DT (> 160-mm MCL) abundance within the Proposed Project Study Area and Reconfigured Alternative Disturbance Area. Abundance estimates were calculated according to the 2009 survey protocol included in *Preparing for Any Action That May Occur within the Range of the Mojave Desert Tortoise* (*Gopherus agassizii*) (USFWS 2009b) if protocol assumptions were met (e.g., minimum of 20 DTs are detected).

2.2.6 Western Burrowing Owl Protocol

WBO surveys focused on suitable habitat in the Proposed Project Disturbance Area, the Reconfigured Alternative Disturbance Area, and associated buffers[8] (Figures 6 and 7). Surveys followed the *Burrowing Owl Survey Protocol and Mitigation Guidelines* prepared by The California Burrowing Owl Consortium (CBOC) (1993). In accordance with the protocol, a habitat assessment (Phase I survey) for WBO was conducted in previously unsurveyed portions of the Proposed Project and Reconfigured Alternative Disturbance Areas and in the surrounding 150-meter (approximately 492-foot) buffer zone. Following the Phase I survey, a focused burrow survey (Phase II survey) and WBO survey (Phase III survey) were conducted in suitable habitat within proposed Disturbance Areas and the surrounding 492-foot buffer zone. Also, a more general survey of habitat suitability and occurrence of WBO, other special-status species, and sign was conducted by the DT crew within a one-mile CEC buffer surrounding Disturbance Areas (according to *Draft Recommended Biological Resources Field Survey Guidelines for Large Solar Projects* [CEC 2007]).

The following describes, in more detail, the WBO survey approach and methodology followed in 2010, and is consistent with surveys conducted in 2009.

[8] The spring 2010 surveys focused on areas within buffers that were not surveyed in 2009.

Phase I Survey: Habitat Assessment

On February 17, 2010, Project biologists Shelly Dayman, Art Davenport, Brooks Hart, and Gregg Lukasek assessed the 2010 Survey Area for WBO habitat (Phase I of the CBOC protocol). The unsurveyed portions of the Combined Survey Area and the surrounding approximately 492-foot buffer zone were evaluated for suitability for WBO, as well as unsurveyed areas within a 1-mile buffer of proposed Disturbance Areas. Suitable habitat for WBO includes open habitat with available burrowing opportunities, including agricultural fields (active and fallow), Mojave creosote scrub, desert saltbush, ephemeral washes, and ruderal areas. Suitable habitat was mapped in the field using high-resolution field maps. Any WBOs or their sign (e.g., whitewash, pellets, feathers) observed during the Phase I survey were recorded and mapped.

Phase II Survey: Burrow Mapping

The Phase II burrow survey was initiated in early spring and was mostly conducted concurrently with focused presence-or-absence DT surveys between March 15 and May 14, 2010. The Phase II burrow survey was conducted in suitable WBO habitat within previously unsurveyed portions of the Combined Survey Area, as well as within the 492-foot buffer zone, as required by the CBOC protocol. Where the Phase II burrow survey was conducted concurrently with DT presence-or-absence surveys, it was conducted along pedestrian transects spaced at a maximum of 10 meters (approximately 30 feet) apart; otherwise, spacing between transects may have extended up to 30 meters (approximately 100 feet), in accordance with the CBOC protocol. Biologists conducting the Phase II survey recorded and mapped potentially suitable burrows (based on burrow dimensions and characteristics); they also recorded and mapped WBO observations, presence and types of WBO sign (e.g., whitewash, pellets, feathers) observed, and active or potentially active WBO burrows (based on the presence and quality of sign at suitable burrows). These features were recorded electronically using GPS units and on data forms; WBO observations and potentially active burrows were also mapped on field maps. Phase II burrow data also included the type of burrow, if known (e.g., desert kit fox; DT), and a GPS identity code.

Phase III Survey: Burrowing Owl Surveys, Census, and Mapping

Project biologists Dana Terry, Jason Phillips, Rob Conohan, Elizabeth Gruenstein, and Veronica Wunderlich conducted Phase III surveys (WBO presence/absence surveys, census, and mapping) during the peak breeding season (April 15–July 15, as defined in the CBOC protocol). Phase III surveys were initiated on May 2, 2010, and completed on May 21, 2010. During the first survey

visit of Phase III, previously mapped (during Phase II) suitable burrows were surveyed by biologists carefully approaching on foot to determine the presence of WBOs and/or WBO sign, in order to assess potential burrow status. Subsequent survey visits (i.e., visits two to four) focused on burrows with WBO sign. Based on 2009 survey results, the Proposed Project site is known to include several burrows with WBO sign that is old and degraded, sparse, and absent of any indication of current or recent use. All burrows with confirmed WBO sign (including those with old, degraded, or sparse sign) were surveyed four times. For any active or potentially active WBO burrows (i.e., burrows with sign of current or recent occupancy by WBO) identified during visit one, the burrow areas were observed during subsequent visits (i.e., visits two to four) using binoculars or a spotting scope, using the vehicle as a blind (if possible); all other burrows with sign were approached on foot. It is important to minimize disturbance near active/occupied burrows; if WBOs were detected in association with a burrow, attempts were made to determine the burrow status without approaching the burrow too closely on foot.

Phase III surveys were conducted between 1 hour before and 2 hours after sunrise, and between 2 hours before and 1 hour after sunset. Phase III surveys were not conducted during inclement weather (e.g., wind speeds > 20 miles per hour, heavy rain or fog, etc.). Field data recorded during each survey visit included date; survey number; weather conditions (temperature, wind, precipitation, cloud cover); surveyor name; start and stop times for each survey visit; location of burrows surveyed during each visit; the suitability of each burrow, based on burrow dimensions and characteristics (collected during first visit to the burrow); presence, absence, and type of WBO sign (if present) at each burrow; occupancy status (active, potentially active (WBO not confirmed, but condition of sign present indicates possible use in current year), inactive with sign (based on presence of old or degraded sign), inactive (burrow of suitable size, but no evidence of use by WBO), documentation of any WBO detections, including abundance, age, sex, and behavior; and other wildlife species observed. Photographs were taken of any potentially active burrow locations. In addition, photographs of individual WBOs and active burrows were taken, if possible without disturbing owls. Any special status species or their sign observed during these surveys was recorded electronically using GPS and on data forms.

2.2.7 Golden Eagle Surveys

A GOEA field survey commenced in 2010 within the Proposed Project and Reconfigured Alternative BRSAs.

Prior to conducting field surveys, existing applicable studies conducted in the vicinity of the BSPP, other related data and reports, and any potentially relevant correspondence from the

resource agencies regarding golden eagles were reviewed, including the review of BLM's historic documents.

Helicopter- and ground-based raptor surveys were conducted, following the USFWS *Interim Golden Eagle Technical Guidance: Inventory and Monitoring Protocols; and Other Recommendations in Support of Golden Eagle Management and Permit Issuance* (USFWS 2010), to record and report occupancy (Phase 1) and productivity (Phase 2) of resident golden eagles including, but not limited to, the following:

- individual activities, and
- nests and territories on and surrounding the subject project, and within an approximate 10-mile radius of the BSPP.

The surveyors recorded activity of any raptors/sensitive species (e.g., Swainson's hawk, etc.). During flight, two biologists observed at all times while one recorded and marked data when appropriate. When possible, at least one biologist with knowledge of bighorn sheep biology was present during surveys. Two GPS units, one primary and one backup, were used to document geographic locations of importance and routes taken. A manual back up of these coordinates was recorded in field notes. Two surveys (helicopter or ground based) have occurred at the BSPP, based on the recent changes to the Eagle Protection Act. The first (Phase 1 helicopter survey) was completed on March 25–26 and April 2–3, 2010, and the second (Phase 2) occurred on May 14, 2010, by Wildlife Research Institute, Inc. The extent of the GOEA survey area is greater than the recommended 10-mile radius of the BSPP because surveys are being conducted in coordination with GOEA surveys for several other nonrelated solar energy projects proposed in the vicinity of the BSPP. However, only results within a 10-mile radius of BSPP are presented herein. Preliminary results are presented in this BRTR and final results will be presented in an addendum to this report.

If at any time during helicopter surveys bighorn sheep were detected (e.g., flushed), helicopter surveys were terminated in areas within approximately 0.75 mile of the detection. In addition, the bighorn sheep detection was recorded on survey data forms, including the GPS location of the detection and any information about what was seen, and the appropriate resource agency biologist(s) was notified as soon as possible. If the area for which surveys were terminated required further survey for GOEA occupancy, surveyors returned to the area on foot (i.e., ground based surveys).

In addition to the helicopter surveys, ground monitoring of GOEA territories for nesting success may be required. The ground monitoring methodology shall follow Section VII.c Ground Surveys of the USFWS interim guidelines for GOEA surveys (USFWS 2010). Observation Posts (OPs) will be set up no closer than 300 meters (approximately 985 feet), and no farther than 700 meters (approximately 2,300 feet) if feasible, for monitoring territories. Where terrain interferes with monitoring, the maximum allowable OP distance would be 1,600 meters (1-mile). There shall be two monitoring periods per nest, separated by a minimum of 30 days. Each period shall consist of at least 4 hours of monitoring per known nest site, or until territory occupancy can be confirmed. All dates shall be recorded for each monitoring visit, fledging success, confirmation of nesting failure, or other pertinent nesting data. The criteria used to conclude the success or failure of a nest will be recorded.

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CHAPTER 3
EXISTING CONDITIONS

The existing conditions presented in this chapter represent findings within the Combined Survey Area (as defined in Section 1.2). The following sections describe existing conditions present in 2009 and 2010 for vegetation communities, jurisdictional areas, and special status plant and wildlife species. Pertinent biological findings are reported separately for the Proposed Project Study Area, Reconfigured Alternative Disturbance Area, and buffer areas. Since surveys were focused in the Proposed Project Study Area and Reconfigured Alternative Disturbance Area, the remaining findings are reported for the Proposed Project BRSA and the Reconfigured Alternative BRSA to avoid misleading interpretations of the data.

3.1 VEGETATION COMMUNITIES

Eight vegetation communities and other cover types were identified within the Combined Survey Area during 2009–2010 field surveys, including upland, riparian, and other cover types. The acreages of each vegetation community within the Combined Survey Area are provided in Table 3.

Vegetation communities are described in detail below and based on a classification system by R. Holland (1986). When appropriate, vegetation classification by J.O. Sawyer and T. Keeler-Wolf (1995) are also considered. Community types according to CDFG (2003) are listed where applicable. Photographic documentation of vegetation communities is included in the Botanical Survey Report (Attachment C).

Three of the vegetation communities are considered sensitive: creosote bush – big galleta association, desert dry wash woodland, and unvegetated ephemeral dry wash. Desert dry wash woodland and unvegetated ephemeral dry wash communities are sensitive because they are also State waters under the jurisdiction of the CDFG. In addition, both the creosote bush – big galleta association and desert dry wash woodland are special community types (e.g., high priority for inventory in the CNDDB) per CDFG's Vegetation and Mapping Program (CDFG 2003b).

Each vegetation community description below is provided in the context of the Combined Survey Area. For direct comparisons between the Proposed Project BRSA and Reconfigured Alternative BRSA, please refer to the impacts discussions in Chapter 4.

Table 3
Vegetation Communities and Cover Types within the Combined Survey Area (Acres)

Vegetation Communities and Other Cover Types	Proposed Project BRSA			Reconfigured Alternative BRSA		
	Study Area	Buffer Area	Total[2]	Disturbance Area	Buffer Area	Total[2]
Riparian						
Creosote Bush – Big Galleta Association	403.10	70.54	**473.64**	237.04	220.28	**457.32**
Desert Dry Wash Woodland	220.16	650.52	**870.68**	171.32	594.34	**765.66**
Unvegetated Ephemeral Dry Wash[1]	8.68	2.71	**11.39**	4.96	6.40	**11.36**
Subtotal Riparian[2]	*631.94*	*723.77*	***1,355.71***	*413.32*	*821.02*	***1,234.34***
Upland						
Sonoran Creosote Bush Scrub	6,606.87	12,783.70	**19,390.57**	5,134.66	12,584.71	**17,719.37**
Stabilized and Partially Stabilized Desert Dunes	363.12	2,299.50	**2,662.62**	0	0	**0**
Subtotal Upland[2]	*6,969.99*	*15,083.20*	***22,053.19***	*5,134.66*	*12,584.71*	**17,719.37**
Other Cover Types						
Agricultural Land	6.50	1,059.77	**1,066.27**	0	1,236.57	**1,236.57**
Developed	5.53	84.97	**90.49**	0	22.18	**22.18**
Disturbed	0	26.54	**26.54**	0	0	**0**
Subtotal Other Cover Types[2]	*12.03*	*1,171.28*	***1,183.30***	*0*	*1,258.75*	***1,258.75***
Total Acres[2]	**7,613.96**	**16,978.25**	**24,592.20**	**5,547.98**	**14,664.49**	**20,212.47**

[1] Unvegetated channels are potentially jurisdictional aquatic features and were not mapped within the buffer because these surveys were conducted at a minimum mapping unit of 1.0 acre, as opposed to 0.01 of an acre for riparian vegetation communities within the Project and Reconfigured Alternative Disturbance Areas. This approach is consistent with the EDAW Jurisdictional Delineation methodology and is pursuant to Appendix B, Section (g), Subsection (13), Paragraph (B), Clause (iii) of the CEC Siting Regulations, which does not require detailed mapping of aquatic features beyond 250 feet of the disturbance limits (CEC 2007).

[2] All values were rounded to the nearest hundredth-acre after summation.

3.1.1 Riparian Vegetation Communities

Three riparian vegetation communities are present within the Combined Survey Area. These communities are associated with the braided washes traversing much of the site and have not been historically exposed to the same disturbance regime as the flat upland areas. Field observations showed that major washes within the western side of the Combined Survey Area exhibited less refuse and historical signs of military training, agricultural, or other human land use. Many of the minor washes within the central and eastern portions of the Combined Survey

Area do not topographically exclude pedestrians and vehicles, and therefore exhibit similar disturbance levels and land use patterns when compared with the surrounding uplands.

Creosote Bush – Big Galleta Association

The creosote bush – big galleta vegetation community is not distinguished by Holland (1986) but is considered a subcomponent of Sonoran creosote bush scrub under Holland Code 33100. This vegetation type is listed as the Creosote Bush – Big Galleta Association (33.010.13) in the CDFG List of California Terrestrial Natural Communities Recognized by the CNDDB, and is considered a special community on this list (CDFG 2003). Special community types are either known or believed to be of high priority for inventory in the CNDDB (CDFG 2003). This community is considered a relatively rare vegetation community in California deserts and its range has probably decreased in areas with prolonged heavy grazing (Thomas et al. 2004).

Within the Combined Survey Area, the creosote bush – big galleta vegetation community occurs as an understory component in the washes within the dry desert wash woodland and continues along low sandy areas (swales) within the larger Sonoran creosote bush scrub community of the Combined Survey Area (Table 3) (Figure 8). Dominant and indicator plants of this community include creosote bush (*Larrea tridentata*), big galleta grass (*Pleuraphis rigida*), and cheesebush (*Hymenoclea salsola*). Occasional associates found within this community include brownplume wire lettuce (*Stephanomeria pauciflora* var. *pauciflora*), Utah milkvine (*Cynanchum utahense*), Hartweg's twinevine (*Sarcostemma cynanchoides* ssp. *hartwegii*), and trailing townula (*Sarcostemma hirtellum*).

Desert Dry Wash Woodland

Desert dry wash woodland is considered sensitive by the CNDDB (CDFG 2003) and BLM (2002). Desert dry wash woodland is designated by Holland (1986) as Code 62200 and is classified by the CNDDB (CDFG 2003) as the Blue Palo Verde – Ironwood – Smoke Tree Woodland Alliance 61.530.00. Desert dry wash woodland is distributed along the larger drainages of the lower Mojave Desert and more generally through the Colorado Desert. Desert dry wash woodland is typically an open vegetation community; however, canopy development and density are variable and may depend on water supply. It is drought-deciduous, microphyllous riparian thorn scrub woodland that can range between 15 and 60 feet tall, dominated by one or more fabaceous trees (Holland 1986).

This vegetation community occupies the major washes that traverse the Combined Survey Area and is dominated by an open overstory of ironwood (*Olneya tesota*), blue palo verde (*Parkinsonia florida*), smoketree (*Psorothamnus spinosus*), cheesebush, catclaw (*Acacia gregii*), dye bush (*Psorothamnus emoryi*), and sweetbush (*Bebbia juncea* var. *aspera*). The dry desert wash woodland within the Combined Survey Area also contains a scattered understory of big galleta grass, desert starvine (*Brandegea bigelovii*), and desert lavender (*Hyptis emoryi*) that is intermixed with creosote bush and Russian thistle (*Salsola tragus*). Tamarisk species, which are invasive, are also interspersed throughout this community.

Desert dry wash woodland occurs throughout a set of braided washes that drain east from the McCoy Mountains and traverse the Combined Survey Area (Table 3) (Figure 8). They originate in steep incised canyons near the western edge of the Combined Survey Area and dissipate as the slope decreases disposing of their alluvia on level areas near the center of the Combined Survey Area. During jurisdictional delineations, it was determined that the percent cover in these washes was moderate for the region (19 percent wash-dependent vegetation).

Unvegetated Ephemeral Dry Wash

This land cover consists of unvegetated washes that are dominated by sandy substrate and little to no vegetation. Unvegetated ephemeral dry wash occurs within the transition zone between the desert dry wash woodland, as the washes are transitioning to sheet flow as they drain to the northeast.

There were no dominant plant species observed in association with unvegetated ephemeral dry wash, as these areas are primarily devoid of vegetation.

Unvegetated ephemeral dry wash is interspersed throughout the dry desert wash woodland within the Combined Survey Area, but is often much smaller than the 0.1-acre MMU threshold. Due to the larger 1.0-acre MMU in the buffer areas, corresponding unvegetated ephemeral dry wash was not mapped in the buffer but was included as a component of the desert dry wash woodland. As a relic of several past Disturbance Area alterations, there is now a small amount of unvegetated ephemeral dry wash mapped within the buffer areas (Table 3) (Figure 8).

3.1.2 Upland Vegetation Communities

Two upland vegetation communities are present within the Combined Survey Area: Sonoran creosote bush scrub and stabilized and partially stabilized desert dunes. Sonoran creosote bush

scrub covers an overwhelming percentage of the acreage of the Combined Survey Area. Past disturbance within the upland vegetation communities of the Combined Survey Area includes military training and agricultural use. These are historical disturbances, and the Sonoran creosote bush scrub within the Combined Study Area has been recovering through natural recruitment. As a result, two invasive plant species, Russian thistle and Saharan mustard, can be found in disturbed areas throughout the Combined Survey Area, especially near roads and in fallow and active agricultural areas. Another exotic plant, Mediterranean grass, is prevalent throughout the Sonoran creosote bush scrub.

Sonoran Creosote Bush Scrub

Sonoran creosote bush scrub is designated by Holland Code 33100 and by the Sawyer and Keeler-Wolf Ocotillo Series 182. This community is characterized by sandy soils with an underlying shallow clay pan on a broad, gentle southeast-trending slope draining into the Colorado River.

Dominant plants for this community within the Combined Survey Area include creosote bush and burroweed (*Ambrosia dumosa*). Brittlebush (*Encelia farinosa*), cheesebush, and ocotillo (*Fouquieria splendens*) also occur.

Sonoran creosote bush scrub is the most common vegetation community within the Combined Survey Area, dominating the alluvial soil deposits (Table 3) (Figure 8). This plant community intergrades into most of the other plant communities within the Combined Survey Area, including the desert dry wash woodland. Within the Combined Survey Area, there are regions of desert pavement covered with rounded cobbles ranging in diameter from 1 to 3 inches. Typically, these areas are higher than the surrounding landscape by 3 to 15 feet. These areas are included with Sonoran creosote bush scrub, though the plant density is lower and the habitat is more open.

Within the utility corridor on the south side of I-10, fine sand drifts are interspersed within more stabilized areas containing a low percentage of creosote bush (1 to 2 percent cover). To be conservative, much of this interspersed creosote bush was included with the stabilized and partially stabilized desert dunes vegetation community described in the following section.

Stabilized and Partially Stabilized Desert Dunes

Stabilized and partially stabilized desert dunes are designated by Holland as 22200 and by Sawyer and Keeler-Wolf as the Mesquite Series 274. This vegetation community occupies the

substation area within the Proposed Project BRSA but does not occur within the Reconfigured Alternative BRSA (Table 3) (Figure 8). Although survey results of the substation are included herein, the substation will be permitted, constructed, maintained and operated by SCE.

Within the Combined Survey Area, this vegetation community does not have a well-developed shrub stratum but does contain more dye bush relative to other areas of the Combined Survey Area. Dominant plants within this community are primarily herbaceous, including several species of *Cryptantha* (e.g., *C. angustifolia*, *C. maritima*, *C. costata*, *C. holoptera*), two species of Astragalus (*A. aridus* and *A. insularis* var. *harwoodii*), scattered big galleta grass, and sand verbena (*Abronia villosa* var. *villosa*). Many plants from the Sonoran creosote bush scrub are sparsely present within this community as well, and much of the area is invaded by Saharan mustard. Four special status plant species were observed within stabilized and partially stabilized desert dunes, two of which are restricted to this vegetation community (refer to Section 3.3).

3.1.3 Other Cover Types

Three other cover types have been defined for the Combined Survey Area, all of which are attributable to human land use: agricultural land, developed, and disturbed.

Agricultural Land

There is no associated Holland or Sawyer and Keeler-Wolf classification for this land cover type. It includes lands that are currently under cultivation and those that are abandoned (e.g., fallow). In the abandoned agriculture areas, native Sonoran creosote bush scrub plant species are beginning to recover. Russian thistle, Saharan mustard, and other exotic plants were observed interspersed with the native vegetation and are indicative of past agricultural disturbance. All disturbed areas associated with past and present agricultural activities are included under this cover type (Table 3) (Figure 8).

Developed Areas

Developed areas within the Combined Survey Area primarily consist of roadways (I-10, deteriorating asphalt road, and dirt access roads). Other developed areas within the Combined Survey Area consist of a large concrete military runway, and cleared land around inholdings (Table 3) (Figure 8).

Disturbed Areas

Disturbed areas are the result of historical or recent ground disturbance such as excavation or off-road vehicle activity. This designation was assigned to unimproved roadsides and a pipeline trench within the Combined Survey Area. These areas are typically linear and small in area (Table 3) (Figure 8).

3.2 WATERS OF THE STATE

All desert dry wash woodland and unvegetated ephemeral desert dry washes, occurring within the DARSA were delineated as waters of the State (Figure 9). In addition, vegetated swales supporting the creosote bush – big galleta grass association were identified and mapped. These vegetated swales consist of a special community type and are considered to have functions and values relevant to the State waters; however, they do not meet the definition of State waters as defined by CFGC. A detailed analysis of waters of the State within each disturbance area is provided in the Jurisdictional Delineation Report included as Attachment E. Waters of the State were not delineated outside of the DARSA.

There are multiple ephemeral washes occurring within the DARSA. These ephemeral washes are primarily located within the western, central, and southern portions of the disturbance areas. Virtually all the ephemeral washes occurring within the DARSA exhibit a northwest-to-southeast flow orientation, with the largest ephemeral wash extending up to approximately 15,000 feet. All desert aquatic features occurring within the DARSA eventually abate (terminate) into the desert landscape within the desert prior to hydrologically connecting to the McCoy Wash. The more developed ephemeral washes support extensive and developed desert dry wash woodland within the western, central, and southern portions of the DARSA. Unvegetated ephemeral desert dry wash, which is primarily devoid of wash-dependent plant species due to less availability of surface and subsurface hydrology, primarily occurs within the east and southeast portions of the disturbance area. Vegetated swales are the most extensive aquatic feature with the DARSA.

The total area of all waters of the State delineated within the Proposed Project DARSA is approximately 350.88 acres. Of these 350.88 acres of jurisdictional waters, 341.76 acres are composed of desert dry wash woodland and 9.12 acres are composed of unvegetated ephemeral dry wash (Table 4). In addition, 410.81 acres of vegetated swales have been delineated as a special community type (Table 5) (Figure 9).

Table 4
Potential Jurisdictional Waters of the United States and State Occurring within the Proposed Project DARSA [a]

Type of Jurisdictional Waters	Type of Habitat (Holland 1986)	Type of Habitat (Cowardin et al. 1979)	Area of Aquatic Resource (acres)[b]			
			Inside Proposed Project DARSA	Directly Outside Proposed Project DARSA		Total Survey Area
				Hydrologically Connected Upstream	Hydrologically Connected Downstream[c]	
Jurisdictional Waters of the United States						
None	N/A	N/A	0.0	0.0	0.0	0.0
		Total USACE Waters =	*0.0*	*0.0*	*0.0*	*0.0*
Subtotal Jurisdictional Waters of the United States			***0.0***	***0.0***	***0.0***	***0.0***
Jurisdictional Waters of the State						
Xeric Riparian Extent	Desert Dry Wash Woodland (Holland Code 62200)	Palustrine; Forested, Broad-Leaved, Evergreen, Intermittently Flooded/Temporary, Well Drained/Fresh, Alkaline	197.04	7.22	137.49	341.76
Ephemeral Channel	Nonvegetated Channel (Holland Code 64200)	Riverine; Unconsolidated Bottom, Sand, Intermittently Flooded, Temporary, Well Drained/Fresh, Alkaline	8.56	0.23	0.33	9.12
		Total CDFG Waters =	205.60	7.45	137.82	350.88
Subtotal Jurisdictional Waters of the State			*205.60*	*7.45*	*137.82*	*350.88*
Grand Total Jurisdictional Waters			**205.60**	**7.45**	**137.82**	**350.88**

[a] Based on the total area of jurisdictional waters delineated within the Proposed Project DARSA. Final acreages of jurisdictional waters of the United States will be based on the jurisdictional determination (JD) process undertaken by the USACE/USEPA to confirm the findings. The total area of federally regulated waters may change after the formal JD process. Swales are generally not considered jurisdictional waters of the United States because they lack an identifiable OHWM, are not tributaries themselves, or they do not have a significant nexus to traditionally navigable waterways (TNWs [e.g., the Pacific Ocean]). Even when not considered a jurisdictional water of the United States or State, swales may still contribute to a surface hydrologic connection between an uplands and aquatic features. However, such hydrological connections are dependent on large, uncommon storm events. The 410.81 acres of vegetated swales are considered a special community type by CDFG and are not considered as jurisdictional waters of the State as defined by Title 14 CCR 1.72 and CFGC Section 1600 *et seq.* and as regulated by CDFG in this JDR.

[b] Acreage of all jurisdictional waters was determined by using the GIS program ArcGIS. All acreages are rounded to the nearest hundredth after summation.

[c] Several areas outside the Proposed Project DARSA were delineated to facilitate impacts analysis as requested by CDFG.

Table 5
Vegetated Swales Occurring within the Proposed Project DARSA

Hydrologic Feature	Type of Habitat (Holland 1986)	Type of Habitat (Cowardin et al. 1979)	Area (acres)[a]			
			Inside Proposed Project DARSA	Directly Outside Proposed Project DARSA		Total Survey Area
				Hydrologically Connected Upstream	Hydrologically Connected Downstream[b]	
Swale supporting Wash-Dependent Vegetation[c]	Creosote Bush – Big Galleta Grass (Sawyer and Keeler-Wolf Code 33.010.13[c])	Palustrine; Scrub/Shrub Broad-leaved Perennial, Intermittently Flooded, Temporary, Well Drained/Fresh, Alkaline	365.59	0.61	44.60	410.81

[a] Acreage of all features was determined by using the GIS program ArcGIS. All acreages are rounded to the nearest hundredth after summation.
[b] Several areas outside the Proposed Project DARSA were delineated to facilitate impacts analysis as requested by CDFG.
[c] Swales are generally not considered jurisdictional waters of the United States because they lack an identifiable OHWM, are not tributaries themselves, or they do not have a significant nexus to traditionally navigable waterways (TNWs [e.g., the Pacific Ocean]). Even when not considered a jurisdictional water of the United States or State, swales may still contribute to a surface hydrologic connection between an uplands and aquatic features. However, such hydrological connections are dependent on large, uncommon storm events.

The total area of all waters of the State delineated within the Reconfigured Alternative DARSA is approximately 256.73 acres. Of these 256.73 acres of jurisdictional waters, 249.90 acres are composed of desert dry wash woodland and 6.83 acres are composed of unvegetated ephemeral dry wash (Table 6). In addition, 283.31 acres of vegetated swales have been delineated (Table 7) (Figure 9).

Table 6
Potential Jurisdictional Waters of the United States and State Occurring within the Reconfigured Alternative DARSA[a]

Type of Jurisdictional Waters	Type of Habitat (Holland 1986)	Type of Habitat (Cowardin et al. 1979)	Area of Aquatic Resource (acres)[b]			
			Inside Reconfigured Alternative DARSA	Directly Outside Reconfigured Alternative DARSA		Total Survey Area
				Hydrologically Connected Upstream	Hydrologically Connected Downstream[c]	
Jurisdictional Waters of the United States						
None	N/A	N/A	0.0	0.0	0.0	0.0
		Total USACE Waters =	*0.0*	*0.0*	*0.0*	*0.0*
Subtotal Jurisdictional Waters of the United States			***0.0***	***0.0***	***0.0***	***0.0***
Jurisdictional Waters of the State						
Xeric Riparian Extent	Desert Dry Wash Woodland (Holland Code 62200)	Palustrine; Forested, Broad-Leaved, Evergreen, Intermittently Flooded/Temporary, Well Drained/Fresh, Alkaline	171.32	7.44	71.15	249.90
Ephemeral Channel	Nonvegetated Channel (Holland Code 64200)	Riverine; Unconsolidated Bottom, Sand, Intermittently Flooded, Temporary, Well Drained/Fresh, Alkaline	4.96	1.28	0.59	6.83
		Total CDFG Waters =	*176.28*	*8.72*	*71.74*	*256.73*
Subtotal Jurisdictional Waters of the State			***176.28***	***8.72***	***71.74***	***256.73***
Grand Total Jurisdictional Waters			**176.28**	**8.72**	**71.74**	**256.73**

[a] Based on the total area of jurisdictional waters delineated within the Proposed Project DARSA. Final acreages of jurisdictional waters of the United States will be based on the jurisdictional determination (JD) process undertaken by the USACE/USEPA to confirm the findings. The total area of federally regulated waters may change after the formal JD process. Swales are generally not considered jurisdictional waters of the United States because they lack an identifiable OHWM, are not tributaries themselves, or they do not have a significant nexus to traditionally navigable waterways (TNWs [e.g., the Pacific Ocean]). Even when not considered a jurisdictional water of the United States or State, swales may still contribute to a surface hydrologic connection between an uplands and aquatic features. However, such hydrological connections are dependent on large, uncommon storm events. The 283.31 acres of vegetated swales are considered a special community type by CDFG and are not considered as jurisdictional waters of the State as defined by Title 14 CCR 1.72 and CFGC Section 1600 *et seq.* and as regulated by CDFG in this JDR.

[b] Acreage of all jurisdictional waters was determined by using the GIS program ArcGIS. All acreages are rounded to the nearest hundredth after summation.

[c] Several areas outside the Reconfigured Alternative DARSA were delineated to facilitate impacts analysis as requested by CDFG.

Table 7
Vegetated Swales Occurring within the Reconfigured Alternative DARSA

Hydrologic Feature	Type of Habitat (Holland 1986)	Type of Habitat (Cowardin et al. 1979)	Area (acres)[a]			
			Inside Proposed Project DARSA	Directly Outside Proposed Project DARSA		Total Survey Area
				Hydrologically Connected Upstream	Hydrologically Connected Downstream[b]	
Swale supporting Wash-Dependent Vegetation[c]	Creosote Bush – Big Galleta Grass (Sawyer and Keeler-Wolf Code 33.010.13[c])	Palustrine; Scrub/Shrub Broad-leaved Perennial, Intermittently Flooded, Temporary, Well Drained/Fresh, Alkaline	237.25	40.06	40.06	283.31

[a] Acreage of all features was determined by using the GIS program ArcGIS. All acreages are rounded to the nearest hundredth after summation.
[b] Several areas outside the Proposed Project DARSA were delineated to facilitate impacts analysis as requested by CDFG.
[c] Swales are generally not considered jurisdictional waters of the United States because they lack an identifiable OHWM, are not tributaries themselves, or they do not have a significant nexus to traditionally navigable waterways (TNWs [e.g., the Pacific Ocean]). Even when not considered a jurisdictional water of the United States or State, swales may still contribute to a surface hydrologic connection between an uplands and aquatic features. However, such hydrological connections are dependent on large, uncommon storm events.

3.3 FLORA

This section discusses plant species detected or with potential to occur within the Proposed Project BRSA and Reconfigured Alternative BRSA, with a focus on occurring or potentially occurring special status plant species.

A total of 168 plant species were detected during 2010 botanical surveys. Of these, 156 plant species are native to the region. Past agricultural and military uses have influenced the exotic weeds found within the BRSA; as a result, 12 of the plant species detected are nonnative: red brome (*Bromus madritensis* ssp. *rubens*), Bermuda grass (*Cynodon dactylon*), barley (*Hordeum* sp.), Mediterranean grass, brome fescue (*Vulpia bromoides*), prickly lettuce (*Lactuca serriola*), Saharan mustard, London rocket (*Sisymbrium irio*), nettleleaf goosefoot (*Chenopodium murale*), Russian thistle, sour clover (*Melilotus indica*), and tamarisk.

Of the native species detected, seven are special status (CNPS Listed and NECO Covered) and two are cactus species targeted at the request of BLM (LaPre 2009). These species are discussed in detail in the following section.

This section is based on the Botanical Survey Report included as Attachment C (AECOM 2009d). Scanned data sheets from botanical surveys and a map of survey tracks walked are included with Attachment C.

A discussion of the special status plant species categories and species detected within the Proposed Project BRSA follows. In addition, at the request of BLM, a section is included on cactus species detected within the Combined Survey Area.

3.3.1 Federally Listed Plant Species

Proposed Project BRSA and Reconfigured Alternative BRSA

Based on a CNDDB search (e.g., a 16-quad CNDDB search including the four USGS Survey quadrangles occupied by the Combined Survey Area and a surrounding 12-quad buffer, CEC and/or SA/DEIS recommendation), one federally listed endangered species, the Coachella Valley milkvetch, has potential to occur within the Proposed Project BRSA (Table 8) (Figures 10 and 11) (CDFG 2010). Suitable habitat, within sandy soils, is present across the Proposed Project BRSA and Reconfigured Alternative BRSA, and in 2009 the potential to occur in the disturbance and buffer areas was considered to be high. Records from 2009 indicated this species occurs approximately 31 miles to the northwest of the Proposed Project BRSA (CDFG 2009). Project biologists visited a CNDDB reference population near the Coachella Valley on April 17, 2009, to determine if the species was flowering during spring 2009 surveys. The species was flowering at the CNDDB reference population indicating that if the species was present in the Proposed Project BRSA, it would have been detected by Project biologists during spring 2009. This provides confirmation that the species is not present within the Proposed Project BRSA.

Prior to spring 2010, Project biologist Andrew Sanders (of the UCR Herbarium) determined that Coachella Valley milkvetch is not currently documented outside of the Coachella Valley area. To reach this conclusion, Mr. Sanders thoroughly reviewed the vouchered collections (identified as Coachella Valley milkvetch) from the Desert Center area (Dice 980324-2; Dice 980324-3; and Sears 1173) and other collection data (e.g., http://ucjeps.berkeley.edu/consortium/ and UCR herbaria specimens). After careful consideration, Mr. Sanders found the Desert Center collections (i.e., all Coachella Valley milkvetch collections outside the Coachella Valley) to be *Astragalus lentiginosus* var. *variabilis* rather than *A. lentiginosus* var. *coachellae*. AECOM concurs with this assessment. Therefore, focused surveys for Coachella Valley milkvetch were not applicable to the spring 2010 BSPP botanical surveys, and field observations during the 2010 survey season corroborated the findings of Mr. Sanders.

Table 8
Special Status Plant Species Potentially Occurring within the Combined Survey Area

Common Name Scientific Name	Sensitivity Status[1]	General Habitat Description (CNPS 2010)	Plant Habit, Flowering Period	Regional Context and Potential for Occurrence within Study Area	Disturbance Area		Buffer	
					Findings[2]	Potential[3]	Findings[2]	Potential[3]

[1] **Sensitivity Status Key**
ESA Federal Endangered Species Act (ESA) Threatened
CNPS California Native Plant Society Lists:
1B: Considered rare, threatened, or endangered in California and elsewhere
2: Plants rare, threatened, or endangered in California, but more common elsewhere
3: Plants for which we need more information – review list
4: Plants of limited distribution a watch list
Decimal notations: .1 - Seriously endangered in California, .2 – Fairly endangered in California, .3 – Not very endangered in California
BLM Special Status Plants (Palm Springs Field Office)
NECO Northern and Eastern Colorado Desert Coordinated Management Plan special status species

[2] **Findings**
P (present) – Species detected during Project surveys
ND (not detected) – Species not detected during Project surveys
TBD – To be determined. This term is used for species that require fall surveys to be detected. However, additional fall surveys may not be necessary because mitigation and/or land acquisition for DT will include habitat for these TBD non-listed special status plant species that may or may not be within the Project Disturbance Area or Reconfigured Alternative Disturbance Area.

[3] **Potential**
NE (not expected) – Suitable habitat for species does not occur
L (low potential) – Suitable habitat present, but of marginal quality
M (moderate potential) – Suitable habitat present
H (high potential) – Suitable habitat present, and species known to occur within the vicinity

CNPS List 1A, CNPS List 1B, and CNPS List 2 Plant Species								
Coachella Valley milkvetch *Astragalus lentiginosus* var. *coachellae*	ESA: Endangered CNPS: List 1B.2 BLM: Sensitive	Sonoran Desert, in sandy areas growing at elevations of 0 to 1,150 feet	Annual or perennial herb that flowers February–May	**Regional Context:** The nearest documented record of this species is 31 miles to the west of the Combined Survey Area, although this has been proven to be a misidentification (Attachment C). Populations are restricted to the Coachella Valley, approximately 50 miles west of the Combined Survey Area (CDFG 2010). The Combined Survey Area is beyond the known species range for Coachella Valley milkvetch.				
				Proposed Project: Habitat for this species occurs within sandy areas, including the stabilized and partially stabilized desert dunes south of I-10 and the sandy washes in the northeast and western portions of the Proposed Project BRSA.	ND	NE	ND	NE

Common Name Scientific Name	Sensitivity Status[1]	General Habitat Description (CNPS 2010)	Plant Habit, Flowering Period	Regional Context and Potential for Occurrence within Study Area	Disturbance Area		Buffer	
					Findings[2]	Potential[3]	Findings[2]	Potential[3]
				Reconfigured Alternative: Habitat for this species occurs within the sandy washes in the northeast and western portions of the Reconfigured Alternative BRSA.	ND	NE	ND	NE
chaparral sand verbena *Abronia villosa* var. *aurita*	CNPS: List 1B.1	Chaparral, coastal scrub, and desert dunes, on sandy soils growing at elevations of 260 to 5,250 feet	Annual herb that flowers January–June	**Regional Context:** The nearest documented record of this species is 105 miles to the west of the Combined Survey Area, in Palm Desert (CCH 2010). The Combined Survey Area is east of the known species range for chaparral sand verbena, and although suitable sandy soils are present within the Combined Survey Area the distance from documented locations is quite far to expect this species to occur. This species was identified by the SA/DEIS as having low potential to occur within the Combined Survey Area. While this report maintains that potential of occurrence to remain conservative, it is the opinion of AECOM biologists that this species is not expected to occur within the Combined Survey Area. This species was therefore not considered during crew training and herbaria review. There was one species from the genus *Abronia* observed within the Combined Survey Area during 2009 and 2010 botanical surveys, which was definitively keyed to *A. villosa* var. *villosa*.				
				Proposed Project: Habitat for this species occurs within sandy areas, including the stabilized and partially stabilized desert dunes south of I-10 and the sandy washes in the northeast and western portions of the Proposed Project BRSA.	ND	L	ND	L
				Reconfigured Alternative: Habitat for chaparral sand verbena occurs only south of I-10. This species was not expected to occur and was not detected within the Reconfigured Alternative BRSA during 2009 or 2010 botanical surveys.	ND	NE	ND	NE

Common Name Scientific Name	Sensitivity Status[1]	General Habitat Description (CNPS 2010)	Plant Habit, Flowering Period	Regional Context and Potential for Occurrence within Study Area	Disturbance Area		Buffer	
					Findings[2]	Potential[3]	Findings[2]	Potential[3]
angel trumpets *Acleisanthes longiflora*	CNPS: List 2.3 NECO	Dry places, generally on carbonate/limestone derived soils in mountainous areas 30 to 8,000 feet	Prostrate to ascending perennial stems <3 feet; flowers produced during May	**Regional Context:** The closest record of this species is on the Big Maria Mountains, 9 miles southeast of the Combined Survey Area (CDFG 2010). The Combined Survey Area is within the known species range of angel trumpets.				
				Proposed Project: The soils within the Proposed Project BRSA are not appropriate for this species.	ND	NE	ND	NE
				Reconfigured Alternative: The soils within the Reconfigured Alternative BRSA are not appropriate for this species.	ND	NE	ND	NE
desert sand-parsley *Ammoselinum giganteum*	CNPS: List 2.3	Sonoran desert scrub growing in dry basins at elevations of 1,300 feet (SA/DEIS and California Consortium of Herbaria (CCH) cite 500 feet elevation [CCH 2010])	Annual herb that flowers March–April	**Regional Context:** Only two documented records of this species exist, 45 miles to the west of the Combined Survey Area, near Hayfields Dry Lake (CCH 2010). Both of these records are from 1922, and the species has not been observed in California since 1922 (even at the 1922 observation sites). The Combined Survey Area is east of the known species range for desert sand-parsley but is not beyond the possible species range if desert sand-parsley is still extant in California. This species was identified by the SA/DEIS as having low potential to occur within the Combined Study Area. While this report maintains that potential of occurrence to remain conservative, it is the opinion of AECOM biologists that this species is not expected to occur within the Combined Survey Area. There are no dry lake beds within the Combined Survey Area, and there are no known extant populations in California. This species was therefore not considered during crew training and herbaria review. There was no species observed from the family Apiaceae within the Combined Survey Area during 2009 and 2010 botanical surveys.				

Common Name Scientific Name	Sensitivity Status[1]	General Habitat Description (CNPS 2010)	Plant Habit, Flowering Period	Regional Context and Potential for Occurrence within Study Area	Disturbance Area		Buffer	
					Findings[2]	Potential[3]	Findings[2]	Potential[3]
				Proposed Project: Habitat for this species does not specifically occur within the Proposed Project BRSA, although there is limited information on the habitat preferences of this species. Desert sand-parsley was not detected within the Proposed Project BRSA during 2009 or 2010 botanical surveys.	ND	L	ND	L
				Reconfigured Alternative: Habitat for this species does not specifically occur within the Proposed Project BRSA, although there is limited information on the habitat preferences of this species. Desert sand-parsley was not detected within the Reconfigured Alternative BRSA during 2009 or 2010 botanical surveys.	ND	L	ND	L
small-flowered androstephium *Androstephium breviflorum*	CNPS List 2.2	Desert dunes	Perennial from corm, 4 to 12 inches; flowers March–April	**Regional Context:** Two documented occurrences are located approximately 50 miles from the Combined Survey Area, one to the northeast and one to the northwest. The Combined Survey Area is south of the documented species range but is not beyond the possible species range of small-flowered androstephium (CCH 2010).				
				Proposed Project: Habitat for this species occurs on dunes and loose sand within the buffer area.	ND	L	ND	L
				Reconfigured Alternative: Habitat for this species occurs on dunes and loose sand within the buffer area.	ND	L	ND	L

Common Name Scientific Name	Sensitivity Status[1]	General Habitat Description (CNPS 2010)	Plant Habit, Flowering Period	Regional Context and Potential for Occurrence within Study Area	Disturbance Area		Buffer	
					Findings[2]	Potential[3]	Findings[2]	Potential[3]
Harwood's milkvetch *Astragalus insularis* var. *harwoodii*	CNPS: List 2.2 NECO	Sonoran Desert, sandy to gravely areas 0 to 1,000 feet	Grayish annual <16 inches; blooms January–May	**Regional Context:** Harwood's milkvetch occurs on site. The range of this species includes concentrations at several points around the southern California deserts. Concentrations are found near Anza Borrego (80 miles southwest), Imperial Valley (50 miles southwest and 60 miles south), and southern Mojave Desert (60 miles northwest). There are also observations about 20 miles to the west of the Combined Survey Area (CCH 2010).				
				Proposed Project: Numerous plants were observed in the transmission line and eastern half of the Proposed Project BRSA, always in stabilized sandy soil (not loose, sandy dunes).	P	H	P	H
				Reconfigured Alternative: Numerous plants were observed in the eastern half of the Reconfigured Alternative BRSA, always in stabilized sandy soil (not loose, sandy dunes).	P	H	P	H
California ayenia *Ayenia compacta*	CNPS List 2.3	Sonoran desert scrub/rocky	Shrub much branched at base, <16 inches; blooms March–April	**Regional Context:** California ayenia is known to occur near Desert Center, about 30 miles west of the Combined Survey Area. The Combined Survey Area is east of the documented species range (which occurs primarily in the western Mojave Desert) but is not beyond the possible species range of California ayenia (CCH 2010).				
				Proposed Project: Habitat for this species may be found in rocky canyons on the western boundary of the buffer zone.	ND	NE	ND	L
				Reconfigured Alternative: Habitat for this species may be found in rocky canyons on the western boundary of the buffer zone.	ND	NE	ND	L

Common Name Scientific Name	Sensitivity Status[1]	General Habitat Description (CNPS 2010)	Plant Habit, Flowering Period	Regional Context and Potential for Occurrence within Study Area	Disturbance Area		Buffer	
					Findings[2]	Potential[3]	Findings[2]	Potential[3]
fairyduster *Calliandra eriophylla*	CNPS: List 2.3 NECO	Sonoran Desert, sandy washes, slopes and mesas, typically found at ± 5,000 feet	Shrub <1 foot that blooms March–April	**Regional Context:** The nearest population occurs 16 miles to the west of the Combined Survey Area (CDFG 2010). The Combined Survey Area is not geographically remote from the species range for fairyduster but is below the typical elevation range for this species.				
				Proposed Project: Marginal habitat for fairyduster occurs within the Proposed Project BRSA. Fairyduster was not detected within the Proposed Project BRSA during 2009 or 2010 botanical surveys.	ND	NE	ND	L
				Reconfigured Alternative: Marginal habitat for fairyduster occurs within the Reconfigured Alternative BRSA. Fairyduster was not detected within the Reconfigured Alternative BRSA during 2009 or 2010 botanical surveys.	ND	NE	ND	L
sand evening-primrose *Camissonia arenaria*	CNPS: List 2.2	Sonoran desert scrub (sandy or rocky) growing at elevations from -200 feet to 3,000 feet	Annual or perennial herb that flowers November–May	**Regional Context:** The nearest documented occurrence is 16 miles south of the Combined Survey Area (CCH 2010). The Combined Survey Area is slightly north of the known species range but is not beyond the possible species range for sand evening-primrose. This species was identified by the SA/DEIS as having low potential to occur within the Combined Study Area. After consideration of this species, it is the opinion of AECOM biologists that sand evening-primrose does have a low potential to occur within the Combined Survey Area. This species was not considered during crew training and herbaria review, as it did not appear in the 16-quad search and related study prior to field surveys. There were six species from the genus *Camissonia* observed within the Combined Survey Area during 2009 and 2010 botanical surveys, each of which was definitively keyed to species (or hybrid) other than sand evening-primrose.				

Common Name Scientific Name	Sensitivity Status[1]	General Habitat Description (CNPS 2010)	Plant Habit, Flowering Period	Regional Context and Potential for Occurrence within Study Area	Disturbance Area		Buffer	
					Findings[2]	Potential[3]	Findings[2]	Potential[3]
				Proposed Project: Habitat for this species occurs within the Proposed Project BRSA. Sand evening-primrose was not detected within the Proposed Project BRSA during 2009 or 2010 botanical surveys.	ND	L	ND	L
				Reconfigured Alternative: Habitat for this species occurs within the Proposed Project BRSA. Sand evening-primrose was not detected within the Reconfigured Alternative BRSA during 2009 or 2010 botanical surveys.	ND	L	ND	L
crucifixion thorn *Castela emoryi*	CNPS: List 2.3 NECO	Desert areas on dry, gravelly washes, slopes, plains found at ±2,150 feet	Shrub <10 feet; blooms April–May	**Regional Context:** The nearest population occurs 20 miles to the northwest of the Combined Survey Area (CDFG 2010). The Combined Survey Area is not geographically remote from the species range for crucifixion thorn but is below the typical elevation range for this species.				
				Proposed Project: Crucifixion thorn was not detected within the Proposed Project BRSA during 2009 or 2010 botanical surveys.	ND	L	ND	L
				Reconfigured Alternative: Crucifixion thorn was not detected within the Reconfigured Alternative BRSA during 2009 or 2010 botanical surveys.	ND	L	ND	L
Abram's spurge *Chamaesyce*	CNPS List 2.2	Sonoran desert scrub (sandy) at elevations from -16	Prostrate annual; blooms	**Regional Context:** The nearest population is 20 miles west near Ford dry lake. The Combined Survey Area is within the known species range of Abram's spurge (CCH 2010).				

Common Name Scientific Name	Sensitivity Status[1]	General Habitat Description (CNPS 2010)	Plant Habit, Flowering Period	Regional Context and Potential for Occurrence within Study Area	Disturbance Area		Buffer	
					Findings[2]	Potential[3]	Findings[2]	Potential[3]
abramsiana		to 3,000 feet	September–November	**Proposed Project:** Habitat for Abram's spurge occurs throughout the Proposed Project BRSA. Results are incomplete pending fall 2010 botanical surveys.	TBD	M	TBD	M
				Reconfigured Alternative: Habitat for Abram's spurge occurs throughout the Reconfigured Alternative BRSA, but results are incomplete pending fall 2010 botanical surveys.	TBD	M	TBD	M
Arizona spurge *Chamaesyce arizonica*	CNPS: List 2.3 BLM Sensitive	Sonoran desert scrub (sandy) growing at elevations from 150 feet to1,000 feet	Perennial herb that flowers March–April	**Regional Context:** The nearest documented occurrence is 90 miles southwest of the Combined Survey Area (CCH 2010). The Combined Survey Area is east of the known species range for Arizona spurge, and although suitable sandy soils are present within the Combined Survey Area the distance from documented locations is quite far to expect this species to occur. This species was identified by the SA/DEIS as having low potential to occur within the Combined Survey Area. While this report maintains that potential of occurrence to remain conservative, it is the opinion of AECOM biologists that this species is not expected to occur within the Combined Survey Area. This species was therefore not considered during crew training and herbaria review. There was one species from the genus *Chamaesyce* observed within the Combined Survey Area during 2009 and 2010 botanical surveys, which was definitively keyed to *C. polycarpa*.				
				Proposed Project: Habitat for this species occurs within the Proposed Project BRSA. Arizona spurge was not detected within the Proposed Project BRSA during 2009 or 2010 botanical surveys.	ND	L	ND	L

Common Name Scientific Name	Sensitivity Status[1]	General Habitat Description (CNPS 2010)	Plant Habit, Flowering Period	Regional Context and Potential for Occurrence within Study Area	Disturbance Area		Buffer	
					Findings[2]	Potential[3]	Findings[2]	Potential[3]
				Reconfigured Alternative: Habitat for this species occurs within the Proposed Project BRSA. Arizona spurge was not detected within the Reconfigured Alternative BRSA during 2009 or 2010 botanical surveys.	ND	L	ND	L
flat-seeded spurge *Chamaesyce platysperma*	CNPS List 1B.2	Desert dunes, Sonoran desert scrub (sandy)	Prostrate annual; blooms May but can also bloom September–November	**Regional Context:** The nearest population is 110 miles west, in Coachella Valley. While suitable habitat is present within the Combined Survey Area, the Combined Survey Area is geographically remote from the species range for flat-seeded spurge (CCH 2010). The CEC specifically requested that flat-seeded spurge be considered during 2010 botanical surveys.				
				Proposed Project: Habitat for flat-seeded spurge occurs throughout the Proposed Project BRSA. Results are incomplete pending fall 2010 botanical surveys.	TBD	L	TBD	L
				Reconfigured Alternative: Habitat for flat-seeded spurge occurs throughout the Reconfigured Alternative BRSA. Results are incomplete pending fall 2010 botanical surveys.	TBD	L	TBD	L
Las Animas colubrina *Colubrina californica*	CNPS: List 2.3 NECO	Sonoran Desert creosote bush scrub <3,500 feet	Shrubs are generally <3 feet; blooms June–July	**Regional Context:** Las Animas colubrina occurs on site. The Combined Survey Area is within the known species range of Las Animas colubrina (CCH 2010).				
				Proposed Project: Numerous plants were observed in the incised washes in the northwestern portion of the Proposed Project BRSA.	P	H	P	H

Common Name Scientific Name	Sensitivity Status[1]	General Habitat Description (CNPS 2010)	Plant Habit, Flowering Period	Regional Context and Potential for Occurrence within Study Area	Disturbance Area		Buffer	
					Findings[2]	Potential[3]	Findings[2]	Potential[3]
				Reconfigured Alternative: Numerous plants were observed in the incised washes in the northwestern portion of the Reconfigured Alternative BRSA.	P	H	P	H
glandular ditaxis *Ditaxis claryana*	CNPS List 2.2 NECO	Sonoran Desert at elevations <350 feet; sandy soils in creosote bush scrub	Annual or perennial herb that blooms from December–May	**Regional Context:** There are records of glandular ditaxis 30 miles to the west of the Combined Survey Area (CDFG 2010). The habitat preferences of this species, sandy soils at low elevations, are present within the Combined Survey Area. The Combined Survey Area is south of the documented species range but is not beyond the possible species range of glandular ditaxis (CCH 2010).				
				Proposed Project: Habitat for glandular ditaxis occurs throughout the Proposed Project BRSA. Results are incomplete pending fall 2010 botanical surveys.	TBD	M	TBD	M
				Reconfigured Alternative: Habitat for glandular ditaxis occurs throughout the Reconfigured Alternative BRSA, but results are incomplete pending fall 2010 botanical surveys.	TBD	M	TBD	M
Harwood's woollystar *Eriastrum harwoodii*	CNPS List 1B.2	Desert dunes and loose sand on valley bottoms at <2,975 feet	Annual, 2 to 12 inches; blooms June–July	**Regional Context:** Harwood's woollystar occurs on site. This species is involved in a taxonomic change from *E. sparsiflorum* and is found in only a few scattered locations on the California desert: within and south of the Mojave National Preserve, east of Joshua Tree National Park, and in the Anza-Borrego area (CCH 2010). The Combined Survey Area is within the known species range of Harwood's woollystar. Refer to extended habitat discussion in Section 5.3.1.				

Common Name Scientific Name	Sensitivity Status[1]	General Habitat Description (CNPS 2010)	Plant Habit, Flowering Period	Regional Context and Potential for Occurrence within Study Area	Disturbance Area		Buffer	
					Findings[2]	Potential[3]	Findings[2]	Potential[3]
				Proposed Project: Numerous plants were observed in the substation and transmission line portions of the Proposed Project BRSA, in association with the stabilized and partially stabilized desert dunes.	P	H	P	H
				Reconfigured Alternative: Harwood's woollystar was not detected within the Reconfigured Alternative BRSA during 2009 or 2010 botanical surveys. All observations were located south of I-10; refer to extended habitat discussion in Section 5.3.1.	ND	H	ND	H
pink velvet mallow *Horsfordia alata*	CNPS List 2	Rocky canyons, creosote bush scrub (rocky), washes	Subshrub <16 inches; March–April; November–December	**Regional Context:** Pink velvet mallow is known to occur about 40 miles south of the Combined Survey Area in Imperial County (CDFG 2010). Although the Combined Survey Area is north of the known species range of pink velvet mallow, habitat for this species may be found in rocky canyons on the western boundary of the Combined Survey Area, and the Combined Survey Area is not beyond the possible species range of pink velvet mallow (CCH 2010).				
				Proposed Project: Habitat for pink velvet mallow occurs throughout the western buffer of the Proposed Project BRSA. Results are incomplete pending fall 2010 botanical surveys.	TBD	M	TBD	M
				Reconfigured Alternative: Habitat for pink velvet mallow occurs throughout the western buffer of the Reconfigured Alternative BRSA, but results are incomplete pending fall 2010 botanical surveys.	TBD	M	TBD	M

Common Name Scientific Name	Sensitivity Status[1]	General Habitat Description (CNPS 2010)	Plant Habit, Flowering Period	Regional Context and Potential for Occurrence within Study Area	Disturbance Area		Buffer	
					Findings[2]	Potential[3]	Findings[2]	Potential[3]
bitter hymenoxys *Hymenoxys odorata*	CNPS List 2.1	Riparian scrub, Sonoran desert scrub (sandy), sandy flats near Colorado River	Annual herb <24 inches; blooms February–May	**Regional Context:** The nearest known populations of bitter hymenoxys are about 20 miles south along the Colorado river. The Combined Survey Area is within the known species range of bitter hymenoxys (CCH 2010).				
				Proposed Project: Bitter hymenoxys was not detected within the Proposed Project BRSA during 2009 or 2010 botanical surveys.	ND	M	ND	M
				Reconfigured Alternative: Bitter hymenoxys was not detected within the Reconfigured Alternative BRSA during 2009 or 2010 botanical surveys.	ND	M	ND	M
slender woolly-heads *Nemacaulis denudata* var. *gracilis*	CNPS: List 2.2	Coastal dunes, desert dunes, and Sonoran desert scrub growing at elevations from -160 feet to1,400 feet	Annual herb that flowers April–May	**Regional Context:** The nearest documented occurrence is 45 miles northeast of the Combined Survey Area (CCH 2010). The Combined Survey Area is within the known species range for slender woolly-heads. This species was identified by the SA/DEIS as having low potential to occur within the Combined Survey Area. After consideration of this species, it is the opinion of AECOM biologists that slender woolly-heads does have a low potential to occur within the Combined Survey Area. This species was not considered during crew training and herbaria review, as it did not appear in the 16-quad search and related study prior to field surveys. There was no species observed from the genus *Nemacaulis* within the Combined Survey Area during 2009 and 2010 botanical surveys.				
				Proposed Project: Habitat for this species occurs within the Proposed Project BRSA. Slender woolly-heads was not detected within the Proposed Project BRSA during 2009 or 2010 botanical surveys.	ND	L	ND	L

Common Name Scientific Name	Sensitivity Status[1]	General Habitat Description (CNPS 2010)	Plant Habit, Flowering Period	Regional Context and Potential for Occurrence within Study Area	Disturbance Area		Buffer	
					Findings[2]	Potential[3]	Findings[2]	Potential[3]
				Reconfigured Alternative: Habitat for this species occurs within the Proposed Project BRSA. Slender woolly-heads was not detected within the Reconfigured Alternative BRSA during 2009 or 2010 botanical surveys.	ND	L	ND	L
Orocopia sage *Salvia greatae*	CNPS List 1B.3 NECO	Southwestern Sonoran Desert (Orocopia, Chocolate Mountains) on alluvial slopes between 100 and 800 feet	Shrubs are <3 feet with blooms from March–April	**Regional Context:** This species has been recorded in the mountains 30 miles to the west of the Combined Survey Area at an elevation of approximately 2,000 feet (CDFG 2010). Habitat for this species is present within the western portion of the BRSA. The Combined Survey Area is east of the known species range but is not beyond the possible species range of Orocopia sage (CCH 2010).				
				Proposed Project: Orocopia sage was not detected within the Proposed Project BRSA during 2009 or 2010 botanical surveys.	ND	M	ND	M
				Reconfigured Alternative: Orocopia sage was not detected within the Reconfigured Alternative BRSA during 2009 or 2010 botanical surveys.	ND	M	ND	M
desert spikemoss *Selaginella eremophila*	CNPS List 2.2	Eastern Peninsular Ranges to the Sonoran Desert at elevations <3,000 feet; shaded sites among rocks, in crevices, and in gravelly soils	Dense mat forming nonflowering plant	**Regional Context:** This species has been recorded 50 miles to the west (CCH 2010). Marginal habitat for this species is present on the Combined Survey Area as shaded sites on gravel soils, in crevices, and among rocks. The Combined Survey Area is east of the known species range but is not beyond the possible species range for desert spikemoss.				
				Proposed Project: Desert spikemoss was not detected within the Proposed Project BRSA during 2009 or 2010 botanical surveys.	ND	L	ND	L

Common Name Scientific Name	Sensitivity Status[1]	General Habitat Description (CNPS 2010)	Plant Habit, Flowering Period	Regional Context and Potential for Occurrence within Study Area	Disturbance Area		Buffer	
					Findings[2]	Potential[3]	Findings[2]	Potential[3]
				Reconfigured Alternative: Desert spikemoss was not detected within the Reconfigured Alternative BRSA during 2009 or 2010 botanical surveys.	ND	L	ND	L
Coves' cassia *Senna covesii*	CNPS List 2.2 NECO	Dry, sandy desert washes, slopes of the Sonoran Desert between 1,600 and 2,000 feet	Small perennial shrub to 2 feet tall; blooms in April	**Regional Context:** This species has been recorded in the Chuckwalla Mountains at higher elevations than the Combined Survey Area, 32 miles to the west (CCH 2010). The Combined Survey Area is within the known species range for Coves' cassia. Elevations may be too low for sandy wash habitat on site to be suitable.				
				Proposed Project: Coves' cassia was not detected within the Proposed Project BRSA during 2009 or 2010 botanical surveys.	ND	L	ND	L
				Reconfigured Alternative: Coves' cassia was not detected within the Reconfigured Alternative BRSA during 2009 or 2010 botanical surveys.	ND	L	ND	L
mesquite nest straw *Stylocline sonorensis*	CNPS: List 1A NECO	Sonoran desert scrub (sandy) growing at elevations of 1,400 feet	Annual herb that flowers April	**Regional Context:** Only two documented records of this species exist, 45 miles to the west of the Combined Survey Area, near Hayfields Dry Lake (CCH 2010). Both of these records are from 1930, and the species is presumed extinct in California (all known occurrences extirpated). The Combined Survey Area is east of the known species range for mesquite nest straw but is not beyond the possible species range if mesquite nest straw is still extant in California. This species was identified by the SA/DEIS as having low potential to occur within the Combined Study Area. While this report maintains that potential of occurrence to remain conservative, it is the opinion of AECOM biologists that this species is not expected to occur within the Combined Survey Area. There are no known extant populations in California. This species was therefore not considered during crew training and herbaria review. There was one species from the genus *Stylocline* observed within the Combined Survey Area during 2009 and 2010 botanical surveys, which was definitively keyed to *C. gnaphaloides*.				

Common Name Scientific Name	Sensitivity Status[1]	General Habitat Description (CNPS 2010)	Plant Habit, Flowering Period	Regional Context and Potential for Occurrence within Study Area	Disturbance Area		Buffer	
					Findings[2]	Potential[3]	Findings[2]	Potential[3]
				Proposed Project: Habitat for this species does occur within the Proposed Project BRSA, however this species is presumed extinct. Mesquite nest-straw was not detected within the Proposed Project BRSA during 2009 or 2010 botanical surveys.	ND	L	ND	L
				Reconfigured Alternative: Habitat for this species does occur within the Reconfigured Alternative BRSA, however this species is presumed extinct. Mesquite nest-straw was not detected within the Reconfigured Alternative BRSA during 2009 or 2010 botanical surveys.	ND	L	ND	L
dwarf germander *Teucrium cubense* ssp. *depressum*	CNPS List 2.2	Sandy soils, washes, and fields in the Sonoran Desert below 1,200 feet	Annual plants up to 6 inches tall; blooms March–May	**Regional Context:** The closest records for this species are 8 miles east of the Combined Survey Area (CDFG 2010). The Combined Survey Area is within the known species range of dwarf germander, and suitable habitat is present within the Combined Survey Area.				
				Proposed Project: Dwarf germander was not detected within the Proposed Project BRSA during 2009 or 2010 botanical surveys.	ND	H	ND	H
				Reconfigured Alternative: Dwarf germander was not detected within the Reconfigured Alternative BRSA during 2009 or 2010 botanical surveys.	ND	H	ND	H

Common Name Scientific Name	Sensitivity Status[1]	General Habitat Description (CNPS 2010)	Plant Habit, Flowering Period	Regional Context and Potential for Occurrence within Study Area	Disturbance Area		Buffer	
					Findings[2]	Potential[3]	Findings[2]	Potential[3]
jackass clover *Wislizenia refracta* ssp. *refracta*	CNPS List 2.2 NECO	Sandy washes, roadsides, alkaline flats in the Mojave Desert, and northern Sonoran Desert between 1,600 and 2,000 feet	Annual herb; blooms April–November	**Regional Context:** The nearest occurrence is adjacent to Palen Dry Lake, 27 miles west of the Combined Survey Area (CDFG 2010). While the Combined Survey Area is not beyond the possible species range for jackass clover, habitat for this species within the Combined Survey Area is not as alkaline as in places where it is recorded.				
				Proposed Project: Jackass clover was not detected within the Proposed Project BRSA during 2009 or 2010 botanical surveys.	ND	L	ND	L
				Reconfigured Alternative: Jackass clover was not detected within the Reconfigured Alternative BRSA during 2009 or 2010 botanical surveys.	ND	L	ND	L
CNPS List 3, CNPS List 4, and Taxonomically Unresolved Plant Species								
ribbed cryptantha *Cryptantha costata*	CNPS List 4.3	Desert dunes, quite specific to loose drifting sand <1,625 feet	Annual 10 to 20 centimeters; branched and bristly; blooms February–May	**Regional Context:** Ribbed cryptantha occurs on site. The range of this species is desert areas of San Bernardino, Riverside, and Imperial counties, with limited outliers as far north as Inyo County over 150 miles to the north. The Combined Survey Area is within the known species range of ribbed cryptantha (CCH 2010).				
				Proposed Project: This species was observed in abundance within the substation and transmission line portions of the Proposed Project BRSA, in association with the stabilized and partially stabilized desert dunes.	P	H	P	H
				Reconfigured Alternative: Ribbed cryptantha was not detected within the Reconfigured Alternative BRSA during 2009 or 2010 botanical surveys. All observations were located south of I-10.	ND	H	ND	H

Common Name Scientific Name	Sensitivity Status[1]	General Habitat Description (CNPS 2010)	Plant Habit, Flowering Period	Regional Context and Potential for Occurrence within Study Area	Disturbance Area		Buffer	
					Findings[2]	Potential[3]	Findings[2]	Potential[3]
winged cryptantha *Cryptantha holoptera*	CNPS List 4.3	Sonoran desert scrub, primarily on rocky slopes <5500 feet	Annual 10 to 50 centimeters; branched and bristly; blooms March–April	**Regional Context:** Winged cryptantha occurs on site. The range of this species is mostly the California desert areas of San Bernardino, Riverside, and Imperial counties, east of a north-south line between Baker and the mountains west of El Centro. There are small outlying populations in Los Angeles and Inyo counties. The Combined Survey Area is within the known species range of winged cryptantha (CCH 2010).				
				Proposed Project: This species was found on an incised rocky wash bank on old alluvium, at the eastern foot of the McCoy Mountains within the western side of the Proposed Project buffer. A winged cryptantha individual was identified south of I-10 within the substation buffer.	ND	H	P	H
				Reconfigured Alternative: This species was found on an incised rocky wash bank on old alluvium, at the eastern foot of the McCoy Mountains within the western side of the Reconfigured Alternative buffer.	ND	H	P	H
Utah milkvine *Cynanchum utahense*	CNPS List 4.3 NECO	Mojave or Sonoran Desert, dry sandy or gravely areas <3,280 feet	Perennial vine growing on shrubs for support; blooms April–June	**Regional Context:** Utah milkvine occurs on site. Within California, this species is concentrated in the southern Mojave Desert, primarily within and near the Twenty-nine Palms Marine Corps base. The Blythe population is one of several smaller outlying populations; others are near I-15 at the Nevada state line, in Mojave National Preserve, and near Anza Borrego. The Combined Survey Area is within the known species range of Utah milkvine (CCH 2010).				

Common Name Scientific Name	Sensitivity Status[1]	General Habitat Description (CNPS 2010)	Plant Habit, Flowering Period	Regional Context and Potential for Occurrence within Study Area	Disturbance Area		Buffer	
					Findings[2]	Potential[3]	Findings[2]	Potential[3]
				Proposed Project: This species was found in several areas within the Proposed Project BRSA, including the base of the McCoy Mountains, the braided washes north of I-10, and in McCoy Wash.	P	H	P	H
				Reconfigured Alternative: This species was found in several areas within the Reconfigured Alternative BRSA, including the base of the McCoy Mountains, the braided washes north of I-10, and in McCoy Wash.	P	H	P	H
snakewood *Condalia globosa* var. *pubescens*	CNPS List 4.2	Sonoran desert scrub < 3,250 feet.	Thorn-tipped shrub <4 meters; blooms March–April	**Regional Context:** The closest population is in Imperial County about 15 miles south of the Combined Survey Area (CCH 2010). The Combined Survey Area is within the known species range for snakewood. Suitable habitat is poorly defined for this species; to remain conservative, the Combined Survey Area must be assumed to contain suitable habitat.				
				Proposed Project: Snakewood was not detected within the Proposed Project BRSA during 2009 or 2010 botanical surveys.	ND	M	ND	M
				Reconfigured Alternative: Snakewood was not detected within the Reconfigured Alternative BRSA during 2009 or 2010 botanical surveys.	ND	M	ND	M

Common Name Scientific Name	Sensitivity Status[1]	General Habitat Description (CNPS 2010)	Plant Habit, Flowering Period	Regional Context and Potential for Occurrence within Study Area	Disturbance Area		Buffer	
					Findings[2]	Potential[3]	Findings[2]	Potential[3]
California ditaxis *Ditaxis serrata* var. *californica*	CNPS List 3.2 NECO	Mojave Desert and northwest Sonoran Desert (Coachella Valley) 150 to 3,300 feet	Annual or perennial herb that blooms from March–May and October–December	**Regional Context:** There are records of California ditaxis 34 miles to the west of the Combined Survey Area (CDFG 2010). The habitat preferences of this species, sandy soils in washes and canyons, are present within the Combined Survey Area. The Combined Survey Area is south of the documented species range but is not beyond the possible species range of California ditaxis (CCH 2010).				
				Proposed Project: California ditaxis was not detected within the Proposed Project BRSA during 2009 or 2010 botanical surveys.	ND	M	ND	M
				Reconfigured Alternative: California ditaxis was not detected within the Reconfigured Alternative BRSA during 2009 or 2010 botanical surveys.	ND	M	ND	M
desert unicorn *Proboscidea althaeifolia*	CNPS List 4.3 NECO	Generally occurs throughout sandy portions of the Sonoran Desert; <3,250 feet	Perennial from tuber-like root; blooms in summer	**Regional Context:** Desert unicorn occurs on site. Within California, this species is found in extreme eastern deserts in San Bernardino, Riverside, and Imperial counties. There are outlying populations in the Anza-Borrego area and the Banning Pass near Cabazon. The Combined Survey Area is within the known species range of desert unicorn (CCH 2010).				
				Proposed Project: This species was found in small numbers throughout the center of the Proposed Project BRSA.	P	H	P	H
				Reconfigured Alternative: This species was found in small numbers throughout the center of the Reconfigured Alternative BRSA.	P	H	P	H

Common Name Scientific Name	Sensitivity Status[1]	General Habitat Description (CNPS 2010)	Plant Habit, Flowering Period	Regional Context and Potential for Occurrence within Study Area	Disturbance Area		Buffer	
					Findings[2]	Potential[3]	Findings[2]	Potential[3]
Palmer's jackass clover *Wislizenia refracta* ssp. *palmeri*	No listing status, proposed new addition to the CNPS inventory (per SA/DEIS)	Sandy washes, roadsides, alkaline flats in the Mojave Desert, and northern Sonoran Desert between 0 and 656 feet (CalFlora 2010)	Annual herb; blooming period undocumented (assumed	**Regional Context:** This species is not yet listed with a special status. The nearest occurrence is 20 miles west of the Combined Survey Area (CCH 2010). While the Combined Survey Area is not beyond the possible species range for Palmer's jackass clover, habitat for this species within the Combined Survey Area is not as alkaline as in places where it is recorded. This species was identified by the SA/DEIS as having low potential to occur within the Combined Survey Area; after consideration of this species, it is the opinion of AECOM biologists that Palmer's jackass clover does have a low potential to occur within the Combined Survey Area. This species was not considered during crew training and herbaria review, as it did not appear in the 16-quad search and related study prior to field surveys. There was no species observed from the genus *Wislizenia* within the Combined Survey Area during 2009 and 2010 botanical surveys.				
				Proposed Project: Palmer's jackass clover was not detected within the Proposed Project BRSA during 2009 or 2010 botanical surveys.	ND	L	ND	L
				Reconfigured Alternative: Palmer's jackass clover was not detected within the Reconfigured Alternative BRSA during 2009 or 2010 botanical surveys.	ND	L	ND	L

No federally listed plant species were detected within the Proposed Project BRSA during spring 2009 and spring 2010.

3.3.2 State Listed Plant Species

Based on regional databases, no State-listed plant species were determined to have potential to occur within the Proposed Project BRSA or Reconfigured Alternative BRSA. Based on site-specific habitat evaluations conducted by AECOM and a literature review, including a CNDDB records search and a compiled list, it was determined that no State-listed plant species were recorded near the Combined Survey Area or have potential to occur in the Combined Survey Area. No State-listed plant species were detected within the Combined Survey Area.

3.3.3 Other Special Status Plant Species

Plant species that are not legally protected under the CESA and/or ESA may still be protected by other regulations, or considered by the scientific community to be sufficiently rare to qualify for special status protections. CNPS List 1A, 1B, and 2 species are fully considered, as they meet the definitions of Section 1901, Chapter 10 (Native Plant Protection Act) or Sections 2062 and 2067 (CESA) during the preparation of environmental documents relating to CEQA. Many CNPS List 3 and 4 species do not meet the definitions of Section 1901, Chapter 10 (Native Plant Protection Act) or Sections 2062 and 2067 (CESA) but are strongly recommended for consideration under CEQA (CNPS 2001). This report fully evaluates plant species meeting any of the above requirements at the request of CEC.

Forty non-listed special status plant species were evaluated based on habitat conditions and regional proximity to the Combined Survey Area. Of these, 31 species were determined to have potential to occur within the Combined Survey Area based on regional occurrence data and habitat analysis (e.g., a 16-quad CNDDB search including the four USGS quadrangles occupied by the Combined Survey Area and a surrounding 12-quad buffer, CEC and/or SA/DEIS recommendation) (Table 8) (CDFG 2010).

During 2009 and 2010 botanical surveys, seven of the 31 non-listed special status plant species with potential to occur were detected within the Combined Survey Area (Tables 9 and 10) (Figures 10 and 11). These species are discussed in detail below.

Table 9
Occurrence Detail for Special Status Plant Species Documented within the Proposed Project BRSA

Species Common Name	Proposed Project BRSA (Number of Occurrences [Plant Count]								
	Study Area			Buffer Area			Total		
	2009	2010	*Subtotal*	2009	2010	*Subtotal*	2009 Total	2010 Total	**GRAND TOTAL**
CNPS List 1B and CNPS List 2 Plant Species									
Harwood's milkvetch	0 (0)	103 (847)	*103* *(847)*	2 (3)	191 (2,457)	*189* *(2,281)*	2 (3)	294 (3,304)	**296** **(3,307)**
Las Animas colubrina	15 (55)	0 (0)	*15* *(55)*	47 (141)	0 (0)	*47* *(141)*	62 (196)	0 (0)	**62** **(196)**
Harwood's woollystar	0 (0)	33 (2,134)	*33* *(2,134)*	0 (0)	72 (1,287)	*72* *(1,287)*	0 (0)	105 (3,421)	**105** **(3,421)**
CNPS List 3, CNPS List 4, and Taxonomically Unresolved Plant Species									
ribbed cryptantha[1]	0 (0) 0 ac	78 ($9.1x10^6$) 363.12 ac	*78* *($9.1x10^6$)* *363.12 ac*	0 (0) 0 ac	143 ($5.8x10^7$) 2,299.50 ac	*143* *($5.8x10^7$)* *2,299.50 ac*	0 (0) 0 ac	221 ($6.6x10^7$) 2,622.62 ac	**221** **($6.6x10^7$)** **2,622.62 ac**
winged cryptantha	0 (0)	0 (0)	*0* *(0)*	0 (0)	9 (15)	*9* *(15)*	0 (0)	9 (15)	**9** **(15)**
Utah milkvine[2]	175 (595)	17 (26)	*192* *(621)*	79 (283)	19 (605)	*98* *(888)*	254 (878)	36 (631)	**290** **(1,509)**
desert unicorn	0 (0)	8 (9)	*8* *(9)*	0 (0)	8 (17)	*8* *(17)*	0 (0)	16 (26)	**16** **(26)**
Additional Plant Species for Consideration at the Request of BLM (LaPre 2009)									
cottontop cactus	3 (3)	5 (7)	*8* *(10)*	4 (4)	0 (0)	*4* *(4)*	7 (7)	5 (7)	**12** **(14)**
California barrel cactus	47 (51)	0 (0)	*47* *(51)*	11 (11)	0 (0)	*11* *(11)*	58 (62)	0 (0)	**58** **(62)**

[1] Ribbed cryptantha is also expressed in terms of area (acres) due to the high abundance of this species in the substation area. Plant counts are estimates, based on subsampling data from within the ribbed cryptantha population (calculated density of 6.2 plants per square meter, or 25,091 plants per acre).

[2] This species uses shrubs for support and tends to form many twining branches that are highly variable in number. Individual plants growing at the base of the same shrub may cause an undercount; therefore, these numbers are approximate.

Table 10
Occurrence Detail for Special Status Plant Species Documented within the Reconfigured Alternative BRSA

Species Common Name	Reconfigured Alternative BRSA (Number of Occurrences [Plant Count]								
	Disturbance Area			Buffer Area			Total		
	2009	2010	*Subtotal*	2009	2010	*Subtotal*	2009 Total	2010 Total	**GRAND TOTAL**
CNPS List 1B and CNPS List 2 Plant Species									
Harwood's milkvetch	0 (0)	69 (290)	*69 (290)*	2 (3)	42 (339)	*44 (342)*	2 (3)	111 (629)	**113 (632)**
Las Animas colubrina	12 (49)	0 (0)	*12 (49)*	50 (147)	0 (0)	*50 (147)*	62 (196)	0 (0)	**62 (196)**
Harwood's woollystar	0 (0)	0 (0)	*0 (0)*	0 (0)	0 (0)	*0 (0)*	0 (0)	0 (0)	**0 (0)**
CNPS List 3, CNPS List 4, and Taxonomically Unresolved Plant Species									
winged cryptantha	0 (0)	0 (0)	*0 (0)*	0 (0)	8 (8)	*8 (8)*	0 (0)	8 (8)	**8 (8)**
Utah milkvine[1]	166 (585)	22 (92)	*188 (677)*	88 (293)	14 (538)	*102 (831)*	254 (878)	36 (630)	**290 (1,508)**
desert unicorn	0 (0)	11 (21)	*11 (21)*	0 (0)	4 (4)	*4 (4)*	0 (0)	15 (25)	**15 (25)**
Additional Plant Species for Consideration at the Request of BLM (LaPre 2009)									
cottontop cactus	2 (2)	3 (5)	*5 (7)*	5 (5)	14 (28)	*19 (33)*	7 (7)	17 (33)	**24 (40)**
California barrel cactus	38 (42)	0 (0)	*38 (42)*	20 (20)	0 (0)	*20 (20)*	58 (62)	0 (0)	**58 (62)**

[1] This species uses shrubs for support and tends to form many twining branches that are highly variable in number. Individual plants growing at the base of the same shrub may cause an undercount; therefore, these numbers are approximate.

Harwood's Milkvetch

Although Harwood's milkvetch was consistently found in sand, the context of the sand was variable. AECOM botanists found this species in patches separated from a few to a few hundred meters from other patches. Most often they were on sandy bottoms or bars within small swales (large washes are denuded due to high flow velocity during storm events). However, a significant number of patches were in depressions within desert pavement or even disturbed areas that had partially stabilized accumulations of windblown sand. This species was often observed directly atop historic excavation sites (e.g., the pipeline traversing the Proposed Project substation buffer) and were even observed adjacent to development and fallowed agricultural fields (Figures 10 and 11). Thus, the sandy substrate appears to be more important to Harwood's milkvetch distribution than the additional moisture that may be present in the washes (i.e., this species was not observed to be wash-dependent or vegetation-dependent, but rather it was consistently observed to be sand-dependent). Tables 9 and 10 detail the occurrences of Harwood's milkvetch within the Proposed Project and Reconfigured Alternative BRSAs.

Las Animas Colubrina

Las Animas colubrina was observed in the incised washes within the northwestern portion of the Combined Survey Area (Figures 10 and 11). In 2009, this species was observed in flower during April, an early blooming period for this species. Las Animas colubrina was not in bloom during 2010 surveys and no new occurrences were detected beyond those documented in 2009. Tables 9 and 10 detail the occurrences of Las Animas colubrina with respect to the Proposed Project and Reconfigured Alternative BRSAs.

Ribbed Cryptantha

Ribbed cryptantha is a desert dune species and is very specifically limited to loose, drifting sand at elevations below 1,600 feet. The species was sometimes mixed with *C. angustifolia* or other congeners, but often was in single-species patches. The distribution of this species within the Proposed Project BRSA reflects the distribution of sand (specifically, stabilized and partially stabilized desert dunes south of I-10) (Figures 10 and 11). Tables 9 and 10 detail the occurrence of ribbed cryptantha within the Proposed Project and Reconfigured Alternative BRSAs.

While ribbed cryptantha has been found elsewhere in sandy washes, AECOM 2010 observations within the Proposed Project BRSA were almost entirely limited to various forms of dunes. Searches of other *Cryptantha* patches only a few feet away failed to turn up *C. costata* if the substrate did not meet the exacting requirements of this species.

Winged Cryptantha

Winged cryptantha primarily occurs on rocky slopes in and near desert mountain ranges, at elevations below 5,500 feet. Specimens within the Combined Survey Area were found along the hard, rocky walls of a wash at the base of the McCoy Mountains (Sanders 2010). A single observation was detected within the substation buffer of the Proposed Project BRSA, in association with the stabilized and partially stabilized desert dunes (indicating that this species may not be obligated to rocky substrates) (Figures 10 and 11). Tables 9 and 10 detail the occurrence of winged cryptantha within the Proposed Project and Reconfigured Alternative BRSAs.

Utah Milkvine

Utah milkvine is a wash species, which is found twining among shrubs and perennial grasses in desert washes below about 3,000 feet in elevation. Several hundred plants were found in both 2009 and 2010 surveys, mostly in the buffer area near the McCoy Mountains. While it can be found in association with any of several shrub species, it was found with some regularity

growing over big galleta grass. Washes dominated by big galleta are the favored habitat for this species within the buffer areas of the Proposed Project BRSA and the Reconfigured Alternative BRSA (Figures 10 and 11). Tables 9 and 10 detail the occurrences of Utah milkvine within the Proposed Project and Reconfigured Alternative BRSAs.

Harwood's Woollystar

Harwood's woollystar occurs on desert dunes and loose sand in valleys below 3,000 feet in elevation. The taxonomy of this species is in transition, and the Jepson Desert Manual (Baldwin et al. 2002) mentions it only as a subspecies of *E. sparsiflorum*. Andrew Sanders said that *E. sparsiflorum* is primarily a species of the Great Basin and desert mountains; plants that key out to *E. sparsiflorum*, but are found on valley bottoms, usually turn out to be *E. harwoodii* (Sanders 2010).

Within the Combined Survey Area, Harwood's woollystar was observed in stabilized and partially stabilized desert dunes south of I-10. This species was found in the same loose, sandy habitat as ribbed cryptantha and is also limited to the substation and transmission line portions of the Proposed Project BRSA (Figures 10 and 11). Tables 9 and 10 detail the occurrences of Harwood's woollystar within the Proposed Project and Reconfigured Alternative BRSAs.

Desert Unicorn

Desert unicorn occurs in sandy washes in the Sonoran Desert below 3,200 feet in elevation. Desert unicorn has an unusual blooming period (during the summer) and produces a large hooked fruit that is transported by animals.

This species was detected within sandy washes throughout the Combined Survey Area (Figures 10 and 11). Tables 9 and 10 detail the occurrences of desert unicorn within the Proposed Project and Reconfigured Alternative BRSAs.

3.3.4 Cactus Species

Before initiation of field surveys, BLM requested that cottontop cactus, hedgehog cactus, and any varieties of California barrel cactus be mapped for future salvage when construction begins (LaPre 2009).

Six species in the family Cactaceae were observed within the Combined Survey Area. Of these, two species are within the genera requested by the BLM: California barrel cactus and cottontop cactus. These observations are shown in Figures 10 and 11. These cactus species are not special

status; therefore, impacts to these are not required to be analyzed. For specific data on the number of individuals observed and their locations, refer to the Botanical Survey Report in Attachment C (AECOM 2009d).

3.4 FAUNA

This section discusses wildlife species detected within or with potential to occur within the Proposed Project BRSA and the Reconfigured Alternative BRSA. In total, 124 wildlife species were detected during general reconnaissance and protocol wildlife surveys within the Combined Survey Area (Attachment F). Of these, 10 special status wildlife species were observed within the Combined Survey Area, including:

- American badger (*Taxidea taxus*)
- Desert tortoise (*Gopherus agassizii*)
- Desert kit fox (*Vulpes macrotis arsipus*)
- Ferruginous hawk (*Buteo regalis*)
- Loggerhead shrike (*Lanius ludovicianus*)
- Northern harrier (*Circus cyaneus*)
- Mojave fringe-toed lizard (*Uma scoparia*; MFTL)
- Swainson's hawk (*Buteo swainsoni*)
- Western burrowing owl (*Athene cunicularia hypugaea*)
- Sonoran yellow warbler (*Dendroica petechia sonorana*)

Couch's spadefoot were not detected within the Combined Survey Area and are therefore not further discussed in this section. Limited ponding potential has been identified and the nearest record of a toad is 5 miles from the project site. The 2010 surveys detected evidence of potential ponding areas; however, no toads have been detected in the vicinity or nearby suggesting they are breeding habitat. The ponds merely have the potential to pond for a sufficient period, based on a qualitative assessment, to support the Couch's spadefoot. Quantitative data regarding length of potential water retention, depth of water (if any), size of the pond, and suitability for breeding were not documented.

A discussion of non-special status wildlife species is provided below, followed by detailed discussions of each special status species detected within the Combined Survey Area. Table 11 provides a summary of the special status species known or potentially occurring with the Proposed Project BRSA and Reconfigured Alternative BRSA. Figures 12 through 20 display special status wildlife species detected in the Proposed Project BRSA and Reconfigured Alternative BRSA and Tables 12 and 13 quantify these results.

Table 11
Special Status Wildlife Species Potentially Occurring within the Combined Survey Area

Common Name Scientific Name	Sensitivity Status[1]	General Habitat Description	Regional Context and Potential for Occurrence within the Study Area	Disturbance Area		Buffer	
				Findings[2]	Potential[3]	Findings[2]	Potential[3]
[1] **Sensitivity Status Key** State: California Department of Fish and Game (CDFG); California Endangered Species Act (CESA) Federal: Federal Endangered Species Act (ESA) BLM: Special Status Plants (Palm Springs Field Office) NECO: Northern and Eastern Colorado Desert Coordinated Management Plan special status species			[2] **Findings** P (present) – Species detected during Project surveys ND (not detected) – Species not detected during Project surveys [3] **Potential** NE (not expected) – Suitable habitat for species does not occur L (low potential) – Suitable habitat present, but of marginal quality M (moderate potential) – Suitable habitat present H (high potential) – Suitable habitat present, and species known to occur within the vicinity				
Reptiles/Amphibians							
Couch's spadefoot (*Scaphiopus couchii*)	BLM: Sensitive CDFG: Species of Special Concern NECO	Occurs in temporary desert rain pools that last at least 7 days. An insect food base (especially termites) must be available (CDFG 2003).	**Regional Context:** The closest known location (2004) is 5 miles east of the site (ARSSC 2010) There are two documented occurrences (2004 and 2007) near McIntyre Park, 15 miles southeast of the site (HerpNet 2010) Additionally, two documented occurrences include two from Imperial County (1989 and 2002) that are between 12 and 17 miles south of the Combined Survey Area (CDFG 2010). The Combined Survey Area is within the range of this species. During spring 2010 surveys, Project biologists noted several areas where there was the potential for sustained (at least 9 days) ponding that could provide habitat for this species. There is no confirmation on the ponding potential and there is no evidence that toads are in the area.				
			Proposed Project: This species was not detected within the BRSA.	ND	H	ND	H
			Reconfigured Alternative: This species was not detected within the BRSA.	ND	H	ND	H
desert tortoise (*Gopherus agassizii*)	CESA: Threatened FESA: Threatened NECO	Various desert scrubs and desert washes up to about 5,000 feet, but not including playas.	**Regional Context:** Suitable habitat is present within the Combined Survey Area within Sonoran creosote bush scrub, desert dry wash woodland, unvegetated ephemeral dry wash, and creosote bush – big galleta grass vegetation communities. The closest documented DT observation based on CNDDB occurs approximately 3 miles northeast from the BRSA (CDFG 2010).				

Common Name Scientific Name	Sensitivity Status[1]	General Habitat Description	Regional Context and Potential for Occurrence within the Study Area	Disturbance Area		Buffer	
				Findings[2]	Potential[3]	Findings[2]	Potential[3]
			Proposed Project: Six adult DTs were observed within the BRSA, one within the southwest corner of the study area and five in the western and southwestern buffers. Potential for DT on the eastern portion of the site is lower than the western side where potential is high.	P	H	P	H
			Reconfigured Alternative: Six adult DTs were observed within the BRSA, one within the southwest corner of the disturbance area, four in the western and southwestern buffers, and one just north of the southwest power block.	P	H	P	H
Mojave fringe-toed lizard (*Uma scoparia*)	BLM: Sensitive CDFG: Species of Special Concern NECO	Occurs in fine, loose, windblown sand in sand dunes, dry lakebeds, riverbanks, desert washes, sparse alkali scrub and desert scrub (CDFG 2003).	**Regional Context:** The only habitat suitable for this species within the Combined Survey Area is within the stabilized and partially stabilized sand dune habitat south of I-10. There are documented CNDDB occurrences within this area (CDFG 2010).				
			Proposed Project: Within the BRSA, 188 MFTL observations were made, 119 observations were made within the study area along the transmission corridor, and 69 were documented in the associated buffer.	P	H	P	H
			Reconfigured Alternative: There is no MFTL habitat within the Reconfigured Alternative for this species. The Reconfigured Alternative is entirely north of I-10.	ND	NE	ND	NE
Birds							
American peregrine falcon (*Falco*	FESA: Delisted CESA: Delisted	Found near wetlands, lakes, rivers, or other water sources. Nests consist of a scrape or a	**Regional Context:** This species may forage in the Combined Survey Area. There are no CDFG (2010) records for Riverside County. There is no suitable nesting habitat present within the Combined Survey Area.				

Common Name Scientific Name	Sensitivity Status[1]	General Habitat Description	Regional Context and Potential for Occurrence within the Study Area	Disturbance Area		Buffer	
				Findings[2]	Potential[3]	Findings[2]	Potential[3]
peregrinus anatum)	CDFG: Fully Protected	depression or ledge in an open site (CDFG 2003).	**Proposed Project:** This species was not detected within the BRSA.	ND	L	ND	L
			Reconfigured Alternative: This species was not detected within the BRSA.	ND	L	ND	L
Bendire's thrasher (*Toxostoma bendirei*)	BLM: Sensitive CDFG: Species of Special Concern NECO	Local spring/summer resident in flat areas of desert succulent shrub/Joshua tree habitats in the Mojave Desert (CDFG 2003).	**Regional Context:** There are CNDDB records from near the Desert Center, approximately 35 miles west of the Combined Survey area, from 2004 (CDFG 2003). The desert dry wash vegetation community with the Combined Survey Area provides potential habitat for this species.				
			Proposed Project: This species was not detected within the BRSA.	ND	L	ND	L
			Reconfigured Alternative: This species was not detected within the BRSA.	ND	L	ND	L
Crissal thrasher (*Toxostoma crissale*)	CDFG: Species of Special Concern NECO	Occurs in dense riparian and mesquite scrub, microphyll woodland, and riparian washes with a dense understory of shrubs (Shuford and Gardali 2008).	**Regional Context:** The closest occurrences of this species documented are two approximately 6 to 8 miles east of the Combined Survey Area and one occurrence approximately 8 miles to the west (CDFG 2003). The Combined Survey Area does not contain suitable dense scrub habitat preferred by this species.				
			Proposed Project: This species was not detected within the BRSA. However, Shuford and Gardali (2008) mention examples of occupied areas between the Salton Sea and the Colorado River.	ND	L	ND	L
			Reconfigured Alternative: This species was not detected within the BRSA. However, Shuford and Gardali (2008) mention examples of occupied areas between the Salton Sea and the Colorado River.	ND	L	ND	L
elf owl (*Micrathene whitneyi*)	CESA: Endangered NECO	In California, nesting areas are limited to cottonwood-willow and mesquite riparian zones along the Colorado River	**Regional Context:** The Combined Survey Area does not contain suitable riparian habitat for this species. The closest known locations are along the Colorado River (CDFG 2010). This species was considered due to proximity to the Colorado River during migration but not expected on site.				

Common Name Scientific Name	Sensitivity Status[1]	General Habitat Description	Regional Context and Potential for Occurrence within the Study Area	Disturbance Area		Buffer	
				Findings[2]	Potential[3]	Findings[2]	Potential[3]
		(CDFG 2003).	**Proposed Project:** This species was not detected within the BRSA.	ND	NE	ND	NE
			Reconfigured Alternative: This species was not detected within the BRSA.	ND	NE	ND	NE
ferruginous hawk (*Buteo regalis*)	BLM: Sensitive CDFG: Watch List (wintering) NECO	Open country, primarily plains, prairies, badlands, sagebrush, shrubland, desert.	**Regional Context:** There are nine recorded occurrences of this species in western Riverside County (CDFG 2010). The Combined Survey Area contains suitable wintering habitat for this species. The species is known to winter in the Colorado River Valley annually. They are most often seen in agricultural fields around Blythe, but occasionally in the open desert as well. There is no breeding habitat on site.				
			Proposed Project: On April 6, 2009, an individual was seen southeast of the disturbance area in the buffer. On April 2, 2010, an individual was seen in the buffer associated with proposed substation.	ND	H (non-breeding)	P (non-breeding)	H (non-breeding)
			Reconfigured Alternative: On April 6, 2009, an individual was seen southeast of the disturbance area in the buffer.	ND	H (non-breeding)	P (non-breeding)	H (non-breeding)
gila woodpecker (*Melanerpes uropygialis*)	CESA: Endangered NECO	Requires live tree-size cactus or dead trees (Winkler et al. 1995).	**Regional Context:** The closest CNDDB record for this species is a 1986 record east of the Combined Survey Area at the Colorado River (CDFG 2010). Suitable nesting habitat for this species is not present within the Combined Survey Area. Nearest occupied habitat is near Blythe on the Colorado River. If present, this highly conspicuous species would have likely been detected during point count surveys.				
			Proposed Project: This species was not detected within the BRSA.	ND	NE	ND	NE
			Reconfigured Alternative: This species was not detected within the BRSA.	ND	NE	ND	NE

Common Name Scientific Name	Sensitivity Status[1]	General Habitat Description	Regional Context and Potential for Occurrence within the Study Area	Disturbance Area		Buffer	
				Findings[2]	Potential[3]	Findings[2]	Potential[3]
gilded flicker (*Colaptes chrysoides*)	CESA: Endangered	Found in habitats with giant cactus, Joshua trees (*Yucca brevifolia*), and riparian groves in desert lowlands and foothills (AOU 1995).	**Regional Context:** The closest CNDDB record for this species is a 1983 record approximately 17 miles northeast of the Combined Survey Area, along the Colorado River (CDFG 2010). This species was not detected within the Combined Survey Area. Within California this species is now confined to a small area of Joshua tree woodland in the eastern Mojave Desert (Cima Dome). If present, this highly conspicuous species would have likely been detected during point count surveys.				
			Proposed Project: This species was not detected within the BRSA.	ND	NE	ND	NE
			Reconfigured Alternative: This species was not detected within the BRSA.	ND	NE	ND	NE
golden eagle (*Aquila chrysaetos*)	BLM: Sensitive CDFG: Watch List NECO	Found in rolling foothills, mountain areas, sage-juniper flats, and deserts. Cliff-walled canyons provide nesting habitat in most parts of its range (CDFG 2003).	**Regional Context:** The two closest known occurrences are over 14 miles from the Combined Survey area, one to the north in the Little Maria Mountains and the other to the south in the Palo Verde Mountains. Preliminary GOEA survey results noted one inactive GOEA nest was located approximately 3 miles west of the Combined Survey Area and another active nest was located just over 10 miles northeast (outside the 10-mile buffer) of the Combined Survey Area.				
			Proposed Project: This species was not detected within the BRSA.	ND	L	ND	L
			Reconfigured Alternative: This species was not detected within the BRSA.	ND	L	ND	L
Le Conte's thrasher (*Toxostoma lecontei*)	BLM: Sensitive CDFG: Species of Special Concern NECO	Desert resident; primarily of open desert wash, desert scrub, alkali desert scrub, and desert succulent scrub habitats (CDFG 2003).	**Regional Context:** The closest CNDDB record for this species is a nesting record from 1977, approximately 8 miles southwest of the Combined Survey Area (CDFG 2010). Le Conte's thrasher may occur within the Combined Survey area; suitable habitat includes desert dry wash woodland.				
			Proposed Project: This species was not detected within the BRSA.	ND	M	ND	M
			Reconfigured Alternative: This species was not detected within the BRSA.	ND	M	ND	M

Common Name Scientific Name	Sensitivity Status[1]	General Habitat Description	Regional Context and Potential for Occurrence within the Study Area	Disturbance Area		Buffer	
				Findings[2]	Potential[3]	Findings[2]	Potential[3]
loggerhead shrike (*Lanius ludovicianus*)	CDFG: Species of Special Concern	Occurs in semi-open country with utility posts, wires, and trees to perch on.	**Regional Context:** The entire Combined Survey Area contains suitable habitat for this species. Although declining over most of the range in California and elsewhere and now absent over large areas, this species is still common in the California deserts.				
			Proposed Project: Twenty-three individuals were detected in the study area and 14 were in the buffer.	P	H	P	H
			Reconfigured Alternative: Twelve individuals were detected in the disturbance area and 20 were in the buffer.	P	H	P	H
mountain plover (*Charadrius montanus*)	BLM: Sensitive CDFG: Species of Special Concern NECO	Occurs in short grasslands, freshly ploughed fields, newly sprouting grain fields, and sometimes sod farms (CDFG 2003).	**Regional Context:** The closest CNDDB record for this species is in Imperial County at the southern end of the Salton Sea (CDFG 2010). This species is not expected to extensively use the Combined Survey Area but may use nearby agricultural areas. This species has a low potential to occur within the Combined Survey Area due to the proximity of agricultural areas.				
			Proposed Project: This species was not detected within the BRSA.	ND	L	ND	L
			Reconfigured Alternative: This species was not detected within the BRSA.	ND	L	ND	L
northern harrier (*Circus cyaneus*)	CDFG: Species of Special Concern	Occurs in coastal salt and freshwater marsh habitats. Nests on the ground in shrubby vegetation (CDFG 2003).	**Regional Context:** There are no CNDDB nesting records for this species in eastern Riverside County (CDFG 2010). The Combined Survey Area contains suitable wintering habitat for this species.				
			Proposed Project: One individual was observed soaring over the study area on April 12, 2010, and two (one on April 2 and one on March 21) were detected within the buffer by the DT crew.	P	H	P	H
			Reconfigured Alternative: One individual was observed soaring over the disturbance area on April 12, 2010, by the DT crew	P	H	ND	H

Common Name Scientific Name	Sensitivity Status[1]	General Habitat Description	Regional Context and Potential for Occurrence within the Study Area	Disturbance Area		Buffer	
				Findings[2]	Potential[3]	Findings[2]	Potential[3]
purple martin (*Progne subis*)	CDFG: Species of Special Concern	Inhabits woodlands, low elevation coniferous forest of douglas-fir, ponderosa pine, and Monterey pine habitats (CDFG 2003).	**Regional Context:** There are six CNDDB records for this species from western Riverside County (CDFG 2010). The Combined Survey Area contains suitable migratory habitat but this species is not expected to extensively utilize the Combined Survey Area.				
			Proposed Project: This species was not detected within the BRSA.	ND	L	ND	L
			Reconfigured Alternative: This species was not detected within the BRSA.	ND	L	ND	L
Short-eared owl (*Asio flammeus*)	CDFG: Fully Protected BLM: Sensitive	Inhabits open country that supports small mammal populations, and provides adequate vegetation cover for nests.	**Regional Context:** The Combined Survey Area contains suitable wintering habitat for the short-eared owl. There are no Riverside County CNDDB (2010) records for this species.				
			Proposed Project: This species was not detected within the BRSA.	ND	L	ND	L
			Reconfigured Alternative: This species was not detected within the BRSA.	ND	L	ND	L
southwestern willow flycatcher (*Empidonax traillii extimus*)	CESA: Endangered FESA: Endangered NECO	Occurs in riparian woodlands throughout southern California (CDFG 2003).	**Regional Context:** The closest known record and suitable habitat are along the Colorado River (CDFG 2010). There is no suitable habitat within the Combined Survey Area. This species was considered due to proximity to the Colorado River during migration but not expected on site.				
			Proposed Project: This species was not detected within the BRSA.	ND	NE	ND	NE
			Reconfigured Alternative: This species was not detected within the BRSA.	ND	NE	ND	NE
Swainson's hawk (*Buteo swainsoni*)	CESA: Threatened	Nesting habitat consists of open habitats with trees, either isolated, scattered, or in wind-rows.	**Regional Context:** There are no CNDDB records for this species in Riverside County (CDFG 2010). The Combined Survey Area may provide foraging habitat for migrating individuals. Migrants more frequently occur near western edge of desert such as Borrego and Morongo valleys, as reflected in annual data from the various regional hawk-watch reports. No suitable breeding habitat exists on site.				

Common Name Scientific Name	Sensitivity Status[1]	General Habitat Description	Regional Context and Potential for Occurrence within the Study Area	Disturbance Area		Buffer	
				Findings[2]	Potential[3]	Findings[2]	Potential[3]
			Proposed Project: Two individuals were seen soaring over the eastern buffer of the BRSA. Numerous observations (seven locations mapped) were made in the transmission corridor south of I-10. Most notably on April 12, 2010, approximately 40 individuals perched in creosote, took flight when approached, and soared overhead. About 50 more individuals were observed perched on ground and in creosote later that day.	p	H (non-breeding)	p	H (non-breeding)
			Reconfigured Alternative: A few (2) were seen soaring over the eastern buffer of the BRSA.	ND	H (non-breeding)	p	H (non-breeding)
Vaux's swift (*Chaetura vauxi*)	CDFG: Species of Special Concern	Occurs in redwood, douglas-fir, and other coniferous forests. Nests in large hollow trees and snags (CDFG 2003).	**Regional Context:** The Combined Survey Area only has the potential to contain migrants of this species.				
			Proposed Project: This species was not detected within the BRSA.	ND	L	ND	L
			Reconfigured Alternative: This species was not detected within the BRSA.	ND	L	ND	L
vermilion flycatcher (*Pyrocephalus rubinus*)	CDFG: Species of Special Concern NECO	During nesting, inhabits desert riparian habitat adjacent to irrigated fields, irrigation ditches, pastures, or other open mesic sites (CDFG 2003).	**Regional Context:** The closest CNDDB records include one from 6 miles west of the Combined Survey Area and one from the Blythe golf course (CDFG 2010). Occurrences of this species are limited to the Colorado River. This species was considered due to proximity to the Colorado River during migration but not expected on site.				
			Proposed Project: This species was not detected within the BRSA.	ND	NE	ND	NE
			Reconfigured Alternative: This species was not detected within the BRSA.	ND	NE	ND	NE

Common Name Scientific Name	Sensitivity Status[1]	General Habitat Description	Regional Context and Potential for Occurrence within the Study Area	Disturbance Area		Buffer	
				Findings[2]	Potential[3]	Findings[2]	Potential[3]
western burrowing owl (*Athene cunicularia hypugaea*)	CDFG: Species of Special Concern NECO	Found mainly in grassland and open scrub from the seashore to foothills. Also found in deserts and scrublands.	**Regional Context:** The entire Combined Survey Area is considered suitable habitat for western burrowing owl nesting and foraging habitat.				
			Proposed Project: Five WBOs were observed: one was an individual flying from a burrow in the western-central part of the disturbance area, the other was an individual flying (no burrow identified) in the buffer on the western side of the BRSA. Two individuals with active burrows were seen within the 1-mile buffer around the substation. The final WBO individual was observed with an active burrow in the buffer of the transmission corridor.	P	H	P	H
			Reconfigured Alternative: One WBO individual was observed within the study area and another was within the buffer on the western side of the BRSA	P	H	P	H
western yellow-billed cuckoo (*Coccyzus americanus occidentalis*)	CESA: Endangered FESA: Candidate	Nests in riparian forest habitat, along the broad lower flood-bottoms of larger river systems (CDFG 2003).	**Regional Context:** The Combined Survey Area does not contain suitable habitat for this species; in this region, this species is associated with the Colorado River only. This species was considered due to proximity to the Colorado River during migration but not expected on site.				
			Proposed Project: This species was not detected within the BRSA.	ND	NE	ND	NE
			Reconfigured Alternative: This species was not detected within the BRSA.	ND	NE	ND	NE
yellow-breasted chat (*Icteria virens*)	CDFG: Species of Special Concern	Inhabits riparian thickets of willow and other brushy tangles near watercourses (CDFG 2003).	**Regional Context:** The Combined Survey Area does not contain suitable habitat for this species; in this region, this species is associated with the Colorado River only. CNDDB records in the region are associated with the Salton Sea or the Colorado River. The closest CNDDB records for this species are from east of the Combined Survey Area at the Colorado River (CDFG 2010). This species was considered due to proximity to the Colorado River during migration but not expected on site.				

Common Name Scientific Name	Sensitivity Status[1]	General Habitat Description	Regional Context and Potential for Occurrence within the Study Area	Disturbance Area		Buffer	
				Findings[2]	Potential[3]	Findings[2]	Potential[3]
			Proposed Project: This species was not detected within the BRSA.	ND	NE	ND	NE
			Reconfigured Alternative: This species was not detected within the BRSA.	ND	NE	ND	NE
Sonoran yellow warbler (*Dendroica petechia sonorana*)	CDFG: Species of Special Concern NECO	Found along mature riparian woodlands that consist of cottonwood, willow, alder, and ash trees.	**Regional Context:** The closest CNDDB records for this species are from east of the Combined Survey Area at the Colorado River (CDFG 2010). This species is not expected to nest within the Combined Survey Area due to a lack of suitable habitat. There is no breeding habitat for this species on site.				
			Proposed Project: Two male yellow warblers were observed within the southwestern portion of the disturbance area during 2009 surveys. Since the subspecies of yellow warbler are nearly indistinguishable in the field, it is not known if these were Sonoran yellow warblers or some other subspecies. Since there is no breeding habitat in the BRSA, these individuals were migrants	P (non-breeding)	M	P (non-breeding)	M
			Reconfigured Alternative: The two individuals observed described above do not occur in the Reconfigured Alternative disturbance area, but occur in the buffer.	ND	M	P (non-breeding)	M
Yuma clapper rail (*Rallus longirostris yumanensis*)	CESA: Threatened FESA: Endangered	Nests in freshwater marshes along the Colorado River and along the south and east ends of the Salton Sea (CDFG 2003).	**Regional Context:** The Combined Survey Area does not contain suitable habitat for this species; in this region, this species is associated with the Colorado River only. CNDDB records in the region are associated with the Salton Sea or the Colorado River. The closest CNDDB records for this species are from east of the Combined Survey Area at the Colorado River (CDFG 2010). This species was considered due to proximity to the Colorado River during migration but not expected on site.				
			Proposed Project: This species was not detected within the BRSA.	ND	NE	ND	NE

Common Name Scientific Name	Sensitivity Status[1]	General Habitat Description	Regional Context and Potential for Occurrence within the Study Area	Disturbance Area		Buffer	
				Findings[2]	Potential[3]	Findings[2]	Potential[3]
			Reconfigured Alternative: This species was not detected within the BRSA.	ND	NE	ND	NE
Mammals							
American badger (*Taxidea taxus*)	CDFG: Species of Special Concern	Coastal sage scrub, mixed chaparral, grassland, oak woodland, chamise chaparral, mixed conifer, pinyon-juniper, desert scrub, desert wash, montane meadow, open areas, and sandy soils.	**Regional Context:** Most of the CNDDB records from the Palo Verde Valley area of Riverside County are prior to 1960 and the closest to the Combined Survey Area is just north of Palo Verde approximately 14 miles south of the Combined Survey Area (CDFG 2010). The entire Combined Survey Area is considered suitable habitat for this species.				
			Proposed Project: This species was detected in both the disturbance area and buffer. Nineteen badger dens and over 90 animal burrows showing evidence of predation by badgers were observed within the BRSA.	P	H	P	H
			Reconfigured Alternative: This species was detected in both the disturbance area and buffer. Nineteen badger dens and 89 animal burrows showing evidence of predation by badgers were observed within the BRSA.	P	H	P	H
big free-tailed bat (*Nyctinomops macrotis*)	CDFG: Species of Special Concern	Occurs in low-lying arid areas in southern California. Needs high cliffs or rocky outcrops for roosting sites (CDFG 2003).	**Regional Context:** This species has the potential to occur as a roosting and foraging bat within the Combined Survey Area. The nearest occurrences for this species in Riverside County are from the vicinity of Palm Springs and Joshua Tree National Park (CDFG 2010).				
			Proposed Project: This species was not detected within the BRSA.	ND	L	ND	L
			Reconfigured Alternative: This species was not detected within the BRSA.	ND	L	ND	L
California leaf-nosed bat (*Macrotus*	BLM: Sensitive CDFG: Species of Special Concern	Occurs in desert riparian, desert wash, desert scrub, desert succulent, alkali scrub and palm oasis habitats. Needs	**Regional Context:** The entire Combined Survey Area contains suitable habitat for this species. There are several CNDDB records in the vicinity of the Combined Survey Area. The nearest record is approximately 3 miles west of the Combined Survey Area in the McCoy Mountains (CDFG 2010).				

Common Name Scientific Name	Sensitivity Status[1]	General Habitat Description	Regional Context and Potential for Occurrence within the Study Area	Disturbance Area		Buffer	
				Findings[2]	Potential[3]	Findings[2]	Potential[3]
californicus)	NECO	rocky, rugged terrain with mines or caves for roosting (CDFG 2003).	**Proposed Project:** This species was not detected within the BRSA.	ND	H	ND	H
			Reconfigured Alternative: This species was not detected within the BRSA.	ND	H	ND	H
cave myotis (*Myotis velifer*)	BLM: Sensitive CDFG: Species of Special Concern NECO	Occurs in lowlands of the Colorado River and adjacent mountain ranges. Requires caves or mines for roosting (CDFG 2003).	**Regional Context:** The nearest CNDDB record is approximately 0.5 mile south of the substation buffer (CDFG 2010).				
			Proposed Project: This species was not detected within the BRSA.	ND	H	ND	H
			Reconfigured Alternative: This species was not detected within the BRSA.	ND	H	ND	H
desert kit fox (*Vulpes macrotis arsipus*)	California Code of Regulations: Protected Fur-bearing Mammal	Suitable habitat for this fossorial mammal consists of arid open areas, shrub grassland, and desert ecosystems.	**Regional Context:** The entire Combined Survey Area contains suitable habitat for this species. Suitable prey base (wood rats, pocket mice, ground squirrels, cottontail rabbits) and habitat to support this species occur throughout much of the undeveloped portions of the Combined Survey Area.				
			Proposed Project: This species was detected in both the disturbance area and buffer. There were 179 desert kit fox burrows and 51 complexes observed throughout the BRSA.	P	H	P	H
			Reconfigured Alternative: This species was detected in both the disturbance area and buffer. There were 175 desert kit fox burrows and 42 complexes observed throughout the BRSA.	P	H	P	H
Nelson's bighorn sheep (*Ovis canadensis nelsonii*)	BLM: Sensitive NECO	Mountain slopes with sparse growth of trees above the desert floor in California.	**Regional Context:** Two metapopulations of this species occur within the NECO planning area: the Southern Mojave and Sonoran. During GOEA Surveys, bighorn sheep were detected in the mountains 11 miles southwest of the Combined Survey Area. The western portion of the Combined Survey Area buffer occurs within the bighorn sheep wildlife habitat management area. The Combined Survey Area provides suitable dispersal habitat for this species. However, no big horn sheep have been detected in the project area or the McCoy Mountains during site surveys or the GOEA surveys.				

Common Name Scientific Name	Sensitivity Status[1]	General Habitat Description	Regional Context and Potential for Occurrence within the Study Area	Disturbance Area		Buffer	
				Findings[2]	Potential[3]	Findings[2]	Potential[3]
			Proposed Project: This species was not detected within the BRSA.	ND	H	ND	H
			Reconfigured Alternative: This species was not detected within the BRSA.	ND	H	ND	H
pallid bat (*Antrozous pallidus*)	BLM Sensitive CDFG: Species of Special Concern NECO	This gregarious species usually roosts in small colonies in rock crevices and buildings, but may nest in caves, mines, rock piles, and tree cavities.	**Regional Context:** The entire Combined Survey Area contains suitable habitat for this species. Primary suitable roosting habitat for this species is within the washes with large trees within the western portion of the Combined Survey Area. The closest documented occurrence in the CNDDB is from 1992 approximately 30 miles to the southwest of the BRSA near Corn Springs (CDFG 2010).				
			Proposed Project: This species was not detected within the BRSA.	ND	M	ND	M
			Reconfigured Alternative: This species was not detected within the BRSA.	ND	M	ND	M
pocketed free-tailed bat (*Nyctinomops femorasaccus*)	CDFG: Species of Special Concern NECO	Occurs in a variety of arid areas in southern California, including pine-juniper woodlands, desert scrub, palm oasis, desert wash, and desert riparian habitats. Found in rocky areas with high cliffs (CDFG 2003)	**Regional Context:** This species has the potential to roost and forage within the Combined Survey Area. The nearest CNDDB record for this species is from near the I-15 bridge over the Colorado River in the City of Blythe (CDFG 2010).				
			Proposed Project: This species was not detected within the BRSA.	ND	M	ND	M
			Reconfigured Alternative: This species was not detected within the BRSA.	ND	M	ND	M
spotted bat (*Euderma maculatum*)	BLM Sensitive CDFG: Species of Special Concern	Occupies a wide variety of habitats from arid deserts and grasslands through mixed conifer forests (CDFG 2003).	**Regional Context:** This species has the potential to roost and forage within the Combined Survey Area. The nearest CNDDB record is from the Colorado Desert near the town of Mecca (CDFG 2010).				
			Proposed Project: This species was not detected within the BRSA.	ND	M	ND	M
			Reconfigured Alternative: This species was not detected within the BRSA.	ND	M	ND	M

Common Name Scientific Name	Sensitivity Status[1]	General Habitat Description	Regional Context and Potential for Occurrence within the Study Area	Disturbance Area		Buffer	
				Findings[2]	Potential[3]	Findings[2]	Potential[3]
Townsend's big-eared bat (*Corynorhinus townsendii*)	BLM Sensitive CDFG: Species of Special Concern NECO	Occurs throughout California in a wide variety of habitats, most commonly in mesic sites. Extremely sensitive to human disturbance (CDFG 2003).	**Regional Context:** The nearest CNDDB record is approximately 7 miles south of the Combined Survey Area (CDFG 2010). Suitable foraging habitat occurs within the Combined Survey Area.				
			Proposed Project: This species was not detected within the BRSA.	ND	M	ND	M
			Reconfigured Alternative: This species was not detected within the BRSA.	ND	M	ND	M
western mastiff bat (*Eumops perotis californicus*)	BLM: Sensitive CDFG: Species of Special Concern NECO	Occurs in many open, semi-arid to arid habitats, including conifer and deciduous woodlands, coastal scrub, grasslands, chaparral, etc. (CDFG 2003).	**Regional Context:** The nearest CNDDB record is approximately 30 miles west of the Combined Survey Area (CDFG 2010). Suitable foraging habitat occurs within the Combined Survey Area.				
			Proposed Project: This species was not detected within the BRSA.	ND	M	ND	M
			Reconfigured Alternative: This species was not detected within the BRSA.	ND	M	ND	M
Yuma mountain lion (*Puma concolor browni*)	CDFG: Species of Special Concern	Occurs in low elevations in the Colorado River Valley of California. Lives in dense bottomland vegetation, also found in adjacent, rocky uplands (CDFG 2003).	**Regional Context:** The nearest known locations are in the mountains and wash systems in Imperial County. Suitable habitat occurs within the Combined Survey Area.				
			Proposed Project: This species was not detected within the BRSA.	ND	H	ND	H
			Reconfigured Alternative: This species was not detected within the BRSA.	ND	H	ND	H
Yuma myotis (*Myotis yumanensis*)	BLM: Sensitive	Optimal habitats include open forests and woodlands with sources of water over which to feed (CDFG 2003).	**Regional Context:** This species has the potential to roost and forage within the Combined Survey Area. The nearest CNDDB record is from near the bridge over the Colorado River in the City of Blythe (CDFG 2010).				
			Proposed Project: This species was not detected within the BRSA.	ND	M	ND	M
			Reconfigured Alternative: This species was not detected within the BRSA.	ND	M	ND	M

Table 12
Desert Tortoise Observations within the Proposed Project BRSA and Reconfigured Alternative BRSA

Sign	Class[a]	Description	Number of Observations					
			Proposed Project			Reconfigured Alternative[b]		
			Study Area	Buffer	BRSA	Disturbance Area	Buffer	BRSA
Tortoises		adult	1	5	6	2	4	6
		adult – second observation		1	1	1		1
Tortoise Burrows	1	active (recent tortoise sign)	5	10	15	7	24	31
	2	definitely tortoise, good condition, no recent sign	12	12	24	11	17	28
	3	definitely tortoise, deteriorated	4	4	8	7	1	8
	4	possibly tortoise, deteriorated	25	12	37	18	18	36
	5	possibly tortoise, good condition	17	19	36	10	29	39
	Total		**63**	**57**	**120**	**53**	**89**	**142**
Tortoise Pallets	1	active (recent tortoise sign)	3		3	3	3	6
	2	definitely tortoise, good condition, no recent sign	3	6	9	4	13	17
	3	definitely tortoise, deteriorated	13	6	19	10	9	19
	4	possibly tortoise, deteriorated	72	7	79	62	17	79
	5	possibly tortoise, good condition	50	12	62	28	64	92
	Total		**141**	**31**	**172**	**107**	**106**	**213**
Tortoise Scat	1	wet or recently dried, obvious odor	3	2	5	2	2	4
	2	dried with glaze, some odor, dark brown	6	2	8	5	4	9
	3	dried, no glaze or odor, light brown, tightly packed	15	4	19	13	6	19
	4	dried, light brown to pale yellow, loose material	6	3	9	6	3	9
	5	bleached or consisting only of plant fiber	13	1	14	12	2	14
	Total		**43**	**12**	**55**	**38**	**17**	**55**
Tortoise Shell Remains	2	carcass, normal color, scutes adhere to bone	5	3	8	4	4	8
	3	carcass, scutes peeling off bone	5	2	7	4	3	7

Sign	Class[a]	Description	Number of Observations					
			Proposed Project			Reconfigured Alternative [b]		
			Study Area	Buffer	BRSA	Disturbance Area	Buffer	BRSA
	4	carcass, shell bone falling apart, growth rings on scutes peeling	16	11	27	17	7	24
	5	bone fragments, not mineralized	79	22	101	50	46	96
		bone fragments, mineralized	288	60	348	169	173	342
	Total		**393**	**98**	**491**	**244**	**233**	**477**
Tortoise Fossilized Bones				1	1		1	1
Tortoise Tracks			3	3	6	5	2	7
Tortoise Egg Shell Fragments				3	3	3		3
Tortoise Drinking Depression				2	2	1	1	2

[a] Classified using the Information Index for Desert Tortoise Sign: Burrows and Dens, Scats and Shell Remains as in the USFWS Protocol (USFWS 1992) (Attachment G).

[b] The Reconfigured Alternative Disturbance Area provides sufficient area for construction of four solar power blocks only. It does not include areas for access roads, staging, office and management facilities, staging area, land treatment unit, dry wash rerouting, water supply, or transmission lines, Therefore the total area is less than the final impact area and this table cannot be used for direct comparisons of impacts.

Table 13
Summary of Non-listed Special Status Species Observations within the Proposed Project BRSA and Reconfigured Alternative BRSA

Species	Proposed Project			Reconfigured Alternative [a]		
	Study Area	Buffer	BRSA	Disturbance Area	Buffer	BRSA
Birds						
Western Burrowing Owl	1	1	2	1	1	2
Western Burrowing Owl with Active Burrow	1	3	4	0	1	1
Burrow with Western Burrowing Owl Sign	76	14	90	58	30	88
Loggerhead Shrike	23	14	37	12	20	32
Loggerhead Shrike Nest		2	2		2	2
Ferruginous hawk		2	2		1	1
Northern Harrier	1	2	3	1		1
Nest Cavity - Unidentified Woodpecker Species	1	3	4		4	4
Mammals						
American Badger Den	14	5	19	17	2	19
American Badger Predation Burrow	85	5	90	65	24	89
Bat Guano - Unknown Species		1	1	1		1
Kit Fox Burrow	158	21	179	85	90	175
Kit Fox Burrow Complex	26	25	51	24	18	42
Reptiles						
Mojave fringe-toed lizard	119	69	188			

[a] The Reconfigured Alternative Disturbance Area provides sufficient area for construction of four solar power blocks only. It does not include areas for access roads, staging, office and management facilities, staging area, land treatment unit, dry wash rerouting, water supply, or transmission lines, Therefore the total area is less than the final impact area and this table cannot be used for direct comparisons of impacts.

3.4.1 Non-Special Status Species

Reptiles and Amphibians

Twenty-three species of reptiles were observed within the Combined Survey Area during 2009 and 2010 surveys. Reptile species most commonly observed on site were the zebra-tailed lizard (*Callisaurus draconoides)*, side-blotched lizard (*Uta stansburiana*), desert iguana (*Dipsosaurus dorsalis)*, western whiptail (*Cnemidophorus tigris*), and desert horned lizard (*Phrynosoma platyrhinos*). These species were relatively common throughout the habitat types observed within the Proposed Project BRSA. Also frequently observed were the long-tailed brush lizard

(*Urosaurus graciosus*), desert spiny lizard (*Sceloporus magister*), long-nosed leopard lizard (*Gambelia wislizenii*), desert patch-nosed snake (*Salvadora hexalepis hexalepis*), sidewinder (*Crotalus cerastes)*, western shovel-nosed snake (*Chionactis accipitalis*), and western banded gecko (*Coleonyx variegates*). Two special status reptile species were observed within the Combined Survey Area: the federally and State-listed as threatened DT and the MFTL, a CDFG SSC. A more detailed discussion of these species is provided below.

Birds

Seventy-one bird species were observed within the Combined Survey Area during 2009 and 2010 surveys. Avian point count surveys were not repeated during the spring 2010 season; therefore, the following results reflect data collected during the spring 2009 season only. A detailed analysis of avian use is provided in the point count survey summary report submitted with the 2009 BRTR (AECOM 2009a). The results of these surveys are applicable to both the Proposed Project BRSA and Reconfigured Alternative BRSA due to the large amount of overlap between them. Overall, 15 species of resident breeding birds were detected during avian point surveys at the BSPP between April 12 and May 8, 2009. Cumulatively across all habitat types, the loggerhead shrike (*Lanius ludovicianus*), black-tailed gnatcatcher (*Polioptila melanura*), ash-throated flycatcher (*Myiarchus cinerascens*), and verdin (*Auriparus flaviceps*) were the most commonly resident recorded species on the point counts.

Thirteen resident species were detected during avian point surveys within Sonoran creosote bush scrub. The most common species observed were horned lark (*Eremophila alpestris*), loggerhead shrike, ash-throated flycatcher, black-throated sparrow (*Amphispiza bilineata*), and lesser nighthawk (*Chordeiles acutipennis*). Individuals from these species accounted for approximately 77 percent of all the bird sightings during point counts.

Ten resident species were detected during avian point surveys in habitat composed of Sonoran creosote bush scrub and desert dry wash woodland. The most common species observed were black-tailed gnatcatcher, ash-throated flycatcher, and verdin. Individual from these species accounted for approximately 77 percent of all the bird sightings during point counts. It should be noted that most of the ash-throated flycatchers recorded in Sonoran creosote bush scrub were in the vicinity of desert dry wash woodland; they were not recorded in areas of Sonoran creosote bush scrub more distant from desert dry wash woodland.

Sonoran creosote bush scrub had the highest number of resident species detected; however, the majority of the BSPP is Sonoran creosote bush scrub and a greater area was sampled for this

habitat type. After adjusting the numbers for the sample effort, habitat composed of Sonoran creosote bush scrub and desert dry wash woodland communities, as expected, has the highest number of resident species detected per station when compared to Sonoran creosote bush scrub. The average number of resident species detected per point count station was three and a half times greater for habitat composed of Sonoran creosote bush scrub and desert dry wash woodland than for Sonoran creosote bush scrub (3.08 species/point count station vs. 0.87, respectively). Among terrestrial habitats in California, Sonoran creosote bush scrub is noted for its low avian diversity, and such is the case for resident birds within the BSPP.

Fourteen species of nonresident birds were identified within or flying over the point count circles during avian point surveys. Of these, tree swallow (*Tachycineta bicolor*) and barn swallow (*Hirundo rustica*) accounted for more than 50 percent of the observations. Sonoran creosote bush scrub had the highest number of nonresident species detected; however, the majority of the site is Sonoran creosote bush scrub and a greater area was sampled for this habitat type. After adjusting the numbers for the sample effort, habitat composed of Sonoran creosote bush scrub and desert dry wash woodland communities, has the highest number of nonresident species detected per station when compared to Sonoran creosote bush scrub. The average number of nonresident species detected per point count station was approximately seven times greater for habitat composed of Sonoran creosote bush scrub and desert dry wash woodland than for Sonoran creosote bush scrub (1.42 species/point count station vs. 0.20, respectively). Among terrestrial habitats in California, Sonoran creosote bush scrub is noted for its low avian diversity, and such is the case for nonresident birds within the BSPP. One non-listed special status species, the yellow warbler, was identified; however, this species is migratory only.

No raptor species (birds of prey) were recorded during surveys within the 382-foot radius point count circles during point count surveys; however, several raptor species were recorded incidental to the point count surveys, including Swainson's hawk (State threatened), ferruginous hawk (BLM Sensitive), and northern harrier (CDFG SSC). A complete list of incidental raptor species observations is included in Attachment F.

During the course of GOEA surveys, 14 redtail hawk (*Buteo jamaicensis*), 1 barn owl (*Tyto alba*), 1 great horned owl (*Bubo virginianus*), and 2 prairie falcon (*Falco mexicanus*) nests were detected within a 10-mile buffer surrounding the Combined Survey Area. Additionally, one inactive GOEA nest was located approximately 3 miles west of the Combined Survey Area and another active nest was located just over 10 miles northeast (outside the 10-mile buffer) of the Combined Survey Area. These results are preliminary; following Phase 2 GOEA surveys, a final GOEA report will present the results along with figures as an addendum to this BRTR.

Mammals

Twenty mammal species were detected within the Combined Survey Area during 2009 and 2010 surveys. Numerous round-tailed ground squirrel (*Spermophilus tereticaudus*), white-tailed antelope squirrel (*Ammospermophilus leucurus*), and desert kangaroo rat (*Dipodomys deserti*) burrows are present across the Combined Survey Area. Less commonly observed were Merriam's kangaroo rat (*Dipodomys merriami)* tracks and burrows, and burrows likely used by the little pocket mouse (*Perognathus longimembris*). Several *Chaetodipus* pocket mouse species are likely present based on burrows and tracks. Desert woodrat (*Neotoma lepida*) nests were numerous and were observed mainly at the base of trees in the dry desert washes. Desert cottontail (*Sylvilagus audubonii*) and black-tailed jackrabbit (*Lepus californicus*) were often observed, as were pallets within bushes that indicate use by these species. Mule deer (*Odocoileus hemionus*) tracks and scat were sometimes (but rarely) observed within the desert dry wash areas. In the 2009 BRTR, it was reported that Nelson's bighorn sheep scat was observed on the western portion of the Combined Survey Area; however, upon expert review by CEC staff (SA/DEIS) it was determined that this scat was likely deer (*Odocoileus hemionus*) scat.

Large mammalian predator activity was documented across the Combined Survey Area. Predator digs, in round-tailed ground squirrel burrows, kit fox burrows, and desert kangaroo rat complexes, were numerous. The majority of predator activity in the Combined Survey Area appears to be by American badgers (*Taxidea taxus*) and desert kit foxes (*Vulpes macrotis arsipus*). Both badger dens and many mammal burrows with badger claw marks (where badgers were foraging for mammal prey) were present. Coyote (*Canis latrans*) activity was also noted, but was more commonly observed on the eastern portion of the Combined Survey Area. Bobcat (*Lynx rufus*) scat was sometimes observed in several of the desert dry wash areas. Mountain lion (*Felis concolor*) likely uses the Combined Survey Area, but no definitive sign for this species was observed.

3.4.2 Special Status Species

Eight species listed under the ESA and/or the CESA occur or have potential to occur in the Combined Survey Area: DT, listed as threatened under the ESA and CESA; Swainson's hawk, listed as threatened under the CESA; elf owl (*Micrathene whitneyi*), western yellow-billed cuckoo (*Coccyzus americanus occidentalis*), gila woodpecker (*Melanerpes uropygialis*), and gilded flicker (*Colaptes chrysoides*), all listed as endangered under the CESA; and Yuma clapper rail and southwestern willow flycatcher, both listed as endangered under the ESA and CESA. Of these species, only DT and Swainson's hawk were observed within the Combined Survey Area

and are expected to occur. Foraging habitat is present for Swainson's hawk, and the species was documented migrating and foraging in the Combined Survey Area. However, the Swainson's hawk is not expected to breed in the Combined Survey Area because of the lack of suitable nesting trees and the absence of breeding records in the Colorado Desert, even historically when the species was more common (Grinnell and Miller 1944; Garrett and Dunn 1981).

Gila woodpecker and gilded flicker have very low potential to occur but were not detected. Four woodpecker nest cavities were found in the Combined Survey Area. It was not confirmed what woodpecker species uses these nest cavities. No focused surveys were conducted for the Gila woodpecker and gilded flicker because the lack of suitable habitat for these species within the Combined Survey Area gives them an extremely low probability of occurring. These species are likely to be detected if present during point count surveys and were not observed. Due to lack of detection and lack of habitat on site, these species are not expected to be present.

Elf owl, western yellow-billed cuckoo, Yuma clapper rail, and southwestern willow flycatcher were considered in evaluation of the Combined Survey Area due to the proximity of the Combined Survey Area to the Colorado River but were not detected and are not expected. No focused surveys were conducted for elf owl, western yellow-billed cuckoo, Yuma clapper rail, and southwestern willow flycatcher because the lack of suitable habitat for these species within the Combined Survey Area gives them an extremely low probability of occurring.

Eight other special status wildlife species were detected within the Proposed Project BRSA: MFTL, WBO, loggerhead shrike, yellow warbler, ferruginous hawk, northern harrier, desert kit fox, and American badger (Table 11). Detailed discussions of special status wildlife species detected and considered resident within the Combined Survey Area are provided below and summarized in Table 11. Those special status species considered as migrants/non-breeding season residents or with potential to occur but not detected are discussed in Table 11. Special status wildlife species observations (with the exception of DT, WBO, and MFTL) are displayed in Figures 12 and 13. With the exception of DT (Table 12), special status wildlife species observations within the Combined Survey Area are quantified in Table 13.

Federally Listed Wildlife Species

Desert Tortoise

The DT is federally listed as threatened under the ESA, with critical habitat designated by the USFWS (USFWS 1994a). The listing was initially made on August 4, 1989, by emergency rule

(USFWS 1989) and by final rule on April 2, 1990 (USFWS 1990). This listing status applies to the entire population of DT, except in Arizona south and east of the Colorado River, and in Mexico. An approved recovery plan has been published by USFWS (1994b). The DT was listed as threatened under CESA on June 22, 1989 (CFGC 1989). No federally designated critical habitat for the DT occurs within the BSPP.

The DT is widely distributed in the deserts of California, southern Nevada, extreme southwestern Utah, and western and southern Arizona, and throughout most of Sonora, Mexico. However, populations over about 50 percent of its U.S. range (30 percent of its overall range) began declining in the late 1960s and early 1970s (USFWS 1990, 1994b). These declines have been attributed to several factors, paramount of which are an upper respiratory tract disease, habitat loss and fragmentation due to urbanization and off-road vehicular use, illegal collecting and vandalism by humans, and predation on young DT, especially by ravens. Raven populations, for example, have exploded with the increasing use of the deserts by humans and their discarded garbage, a prime food source for ravens.

CNDDB records show DT occurrences surrounding but not within the Combined Survey Area. The closest documented DT based on the CNDDB occurs approximately 3 mile northeast of the Combined Survey Area (CDFG 2003a). The next closest DT observation occurs approximately 11 miles to the southwest of the Combined Survey Area. CNDDB record data are largely incomplete and may not provide an accurate depiction of the actual population size and distribution within the area, but can provide some insight into the distribution of DT.

Habitat suitability for the DT is determined by examining vegetation, soils, landscape (topography, terrain, and elevation), and climate. A complex interaction of these variables determines site preference by the species (Nussear et al. 2009). It is likely that the most limiting factor in the distribution of DT within the Combined Survey Area site is water. Within this Combined Survey Area, the amount of water available is related to both elevation and the orographic effects of the mountains on rainfall patterns.

Suitable landscapes for DT are generally defined as alluvial fans and plains and rocky slopes at elevations of 1,969 to 3,937 feet above sea level (USFWS 2008). There have been studies regarding slope and aspect preference for DT (Weinstein 1989; Andersen et al. 2000). DT choose sites based on surface conditions, which are influenced by a complex interaction between climate and topography (Nussear et al. 2009). DTs require soils that can support burrows but also allow for excavation (Andersen et al. 2000). In some cases, DTs take advantage of existing natural shelters such as rock formations or exposed calcic soils horizons (Nussear et al. 2009). The soils

within the Combined Survey Area are suitable for burrowing. Presence of ephemeral plant species is an indicator of habitat suitability for the DT because ephemeral plants are the primary components of the DT diet (Esque 1994; Jennings 1997; Avery 1998). Generally DTs prefer creosote bush scrub habitat with a high diversity and cover of perennial plant species and high productivity of ephemeral plants. Less commonly, DT will occur in blackbrush (*Coleogyne ramosissima*), Joshua tree and juniper at higher elevations, and saltbush (*Atriplex* sp.) at lower elevations (Nussear et al. 2009). The vegetation within the combined survey area consists primarily of Sonoran creosote bush scrub. High ephemeral plant productivity was observed within the drainages on the western side of the BSPP. Ephemeral plant productivity was lower within the desert pavement areas, but pockets of vegetation within the pavement containing plants often occurred.

During habitat assessments, it was determined that the majority of the buffer areas contains suitable habitat for DT, with the exception of agricultural and developed land. Within the Project Disturbance Area, 7,014.8 acres is considered suitable for DT. Approximately 3,990.1 acres of this acreage is moderate-quality DT habitat and 3,024.7 acres is low-quality DT habitat (Figure 14). Within the Reconfigured Alternative Disturbance Area, 5,548.0 acres is considered suitable for DT. Approximately 3,017.1 acres of this acreage is moderate-quality DT habitat (for this area) and 2,530.9 acres is low-quality DT habitat (Figure 15).

Variations in habitat quality within the Combined Survey Area are primarily a result of greater water availability associated with mountainous areas and large drainages to the west. The drainages that flow from the mountains to the west provide areas of relatively higher productivity of forage for DT in the western portion of the Combined Survey Area. The moderate-quality habitat on the west side of the Combined Survey Area contains annual vegetation or shrub cover that is sufficient to support forage and cover needs. This habitat includes areas with high amounts of cover/forage interspersed with areas with low amounts of cover/forage (i.e., desert washes with upland desert pavement). The habitat observed on the east side of each of the BRSAs and south of I-10 is considered low-quality for DT. The lower quality habitat on the east side of the Combined Survey Area has a limited availability of easily accessible washes that have sufficient cover and forage for DT or the habitat has disturbance of vegetation that reduces the quality of the cover/forage for DT. Low-quality DT habitat south of I-10 is characterized by low annual forage, sandy soils, and the general lack of large drainages.

Despite the low-quality habitat and low potential for DT use of the eastern portion of the Combined Survey Area, it should be noted that all portions of the Combined Survey Area may be used by DT for dispersal to and from surrounding habitat, with the western and northeastern

areas within the buffer near McCoy Wash potentially being used more frequently by DT than the eastern areas. DTs are known to use low-quality intermountain habitat, such as that present on the east side of the Combined Survey Area as dispersal routes over time, providing passage between high-quality habitat areas in the surrounding mountains (Averill-Murray and Averill-Murray 2005). Historically, tortoise populations in the Sonoran Desert have exchanged individuals at a rate of one migrant per generation (Averill-Murray and Averill-Murray 2005).

During 2009 surveys, one adult DT was observed within the Proposed Project Study Area (southwest corner) and Reconfigured Alternative Disturbance Area (northeast corner of southwest power block) and two additional adult DTs were observed within the buffer on the west side of the Combined Survey Area. The single adult male DT observed on April 13, 2009, was seen walking on desert pavement toward the east. No active burrow was noted to be associated with this DT during this observation. During botanical surveys on March 26, 2009, an adult DT was observed within a caliche burrow (a cavity eroded or excavated into hard calcium carbonate [caliche] soils) about 600 feet to the west of the Proposed Project Study Area in the buffer. On June 4, 2009, a single adult male DT was observed in the buffer southwest of the Proposed Project Study Area. This DT was observed both inside and outside of his caliche burrow.

During spring 2010 surveys, four adult DTs were encountered during surveys. One adult DT was observed within the Reconfigured Alternative Disturbance Area. The single adult male DT observed within the Reconfigured Alternative Disturbance Area on March 19, 2010, was seen at the entrance to a DT burrow. This individual was seen again on March 20, 2010, walking across the desert pavement. Three additional adult DTs were observed outside of the Proposed Project Study Area and Reconfigured Alternative Disturbance Area, but within the buffers. On March 14, 2010, an adult DT was observed resting at the entrance of a DT burrow about 0.75 mile west of the Proposed Project Study Area and Reconfigured Alternative Disturbance Area during buffer zone surveys. On March 31, 2010, a single adult male DT was observed inside a DT burrow about 1 mile to the southwest of the Reconfigured Alternative Disturbance Area during buffer zone surveys. On May 14, 2010, a single adult male DT was observed by the burrowing owl survey crew inside a DT burrow about 1 mile to the south of the Reconfigured Alternative Disturbance Area and 300 feet to the west of the Proposed Project utility corridor.

Numerous DT burrows and pallets were observed within the Combined Survey Area during surveys and are mapped in Figures 16 and 17. Observations within the Proposed Project BRSA and Reconfigured Alternative BRSA are summarized in Table 12. DT carcasses (relatively intact) and bone fragments were observed within the Proposed Project BRSA. Figures 16 and 17

display carcasses separate from bone fragments and reflect that DT remains are more intact in the western portion of the Proposed Project BRSA and Reconfigured Alternative BRSA. The remains to the east are scattered and disarticulated bone fragments. In many cases these remains may have been washed down drainages from the western side of the Combined Survey Area to the east. The presence of only carcasses in areas may indicate recent die-offs of DT (Tracy et al. 2004). This is unlikely to be the case for the Combined Survey Area because of the observations of recent DT scat and active burrows on the western side of the Disturbance Area (and also within the buffer).

The concentration of DT sign in the western and southwest portions of the Combined Survey Area is consistent with the assessment of generally higher quality habitat for DT on the west and southwest sides of the Combined Survey Area (due to the proximity to mountains and greater availability of water and forage associated with related drainages). The lack of recent DT sign on the east side of the Combined Survey Area and along the transmission line corridor south of I-10 is consistent with the assessment of low-quality habitat for DT in these areas and suggests that DT has a lower probability of occurrence there. Detections on the east side and south of I-10 consisted primarily of disarticulated and scattered bone fragments that may have washed east along drainages from carcasses originating in the west.

The climate and vegetation within the Combined Survey Area are consistent with the Sonoran Desert rather than the Mojave Desert. This is important for explaining the distribution of DT in this area. Precipitation and temperature correlate to elevation, aspect, and geographical location in the desert. Precipitation events such as the monsoon, which are important for DTs in the Sonoran Desert, are highly dependent on local orographic effects from topographic features such as mountains, and vary significantly from one area to another (Nussear et al. 2009). Within the Mojave Desert, the rainfall is a Mediterranean winter rainfall as opposed to a bimodal rainfall pattern with important summer monsoon rains in the Sonoran Desert. It is important to understand that there is increased precipitation in this area at higher elevations. Also, as elevation increases, temperature decreases. This results in a lower evapo-transpiration rate. The increased rainfall and reduced evapo-transpiration rates associated with increases in elevation work in concert to allow for a higher availability of water (for drinking) and increased plant production as elevation increases. The higher temperatures at the Blythe site magnify the effect of the evapo-transpiration rate when compared to Mojave Desert areas. So, DT should be more abundant in the mountains and alluvial fans and drainages associated with the mountains rather than in the valleys (and is more common in the Mojave Desert). This is supported by the distribution of DT and DT sign within the Combined Survey Area. Ephemeral plant production was noted to be higher and longer lasting both within the drainages and at higher elevations,

which supports the supposition that water is more available here as elevation increases. Other factors that may contribute to lower density/use levels of DT on the eastern (lower elevation) side of the Combined Survey Area include the constraints to movement on the eastern and southeastern sides of the BSPP due to residential, commercial (airport), and agricultural use, and the constraint of I-10 to the south.

It was not possible to calculate a DT abundance estimate using the 2009 (USFWS 2009b) protocol since 20 DTs must be observed for this calculation to be valid. During 2009 and 2010 the total number of DTs observed within the Proposed Project Study Area was one and the total number of DTs observed within the Reconfigured Alternative Disturbance Area was one. Because no DTs or any recent DT sign were detected on the east side of the Combined Survey Area during protocol surveys, DTs most likely occur at a very low abundance and density within this area. Only three DTs were detected on the southwest side of the Combined Survey Area during 2010; however, an abundance of recent DT sign was additionally observed throughout this portion of the BRSA. Therefore, DT abundance and density on the west side of the Combined Survey Area are low, but probably slightly greater than in the east. The west side of the Combined Survey Area is also located closer to the neighboring mountains, is of higher quality for DT (e.g., contains higher forage productivity), and would be expected to support a greater number of DT than the east side of the Combined Survey Area. DT densities have shown declining trends at the Chuckwalla Bench (approximately 30 to 40 miles southwest of Blythe) (Tracy et al. 2004; Berry 1997). For comparison, adult DT densities at the Chuckwalla Bench in 1992 were estimated between 22 and 49 individuals per square kilometer (Berry 1997). The Proposed Project Study Area covers approximately 31 square kilometers.

This section is based on the 2009 DT Technical Report (AECOM 2010a) and the 2010 DT Technical Report included as Attachment D (AECOM 2010b). No other federal listed species were detected within the Combined Survey Area. Federally listed species with potential to occur in the Combined Survey Area, but not detected during surveys are discussed in Table 11 and not addressed further in the text.

State-Listed Wildlife Species

The only State-listed species observed in the Combined Survey Area were DT and Swainson's hawk. No suitable breeding habitat occurs on or near the Combined Survey Area for Swainson's hawk. Migrant Swainson's hawks were documented using the area on several occasions. Two individuals were seen soaring over the eastern buffer of the Combined Survey Area. Additionally, numerous observations (seven locations mapped) were made in the transmission

corridor south of I-10. Most notably on April 12, 2010, approximately 40 individuals, perched in creosote, took flight when approached and soared overhead. About 50 more individuals were observed perched on the ground and in creosote later and some were seen foraging on the numerous sphinx moth (*Hiles lineate*) larvae in the transmission corridor south of I-10. Swainson's hawk locations within the Proposed Project BRSA and Reconfigured Alternative BRSA are displayed in Figures 12 and 13. State-listed species with potential to occur in the Combined Survey Area, but not detected during surveys, are discussed in Table 11 and not addressed further in the text.

Non-Listed Special Status Wildlife Species

In addition to the Federally and State-listed species discussed above, eight non-listed special status wildlife species were detected: WBO, loggerhead shrike, yellow warbler (however, migrating only on site), ferruginous hawk (however, wintering only on site), northern harrier (however, wintering only on site), MFTL, desert kit fox, and American badger. Non-listed species with potential to occur in the Combined Survey Area, but not detected during surveys, are discussed in Table 11 and not addressed further in the text. No suitable breeding habitat for yellow warbler, ferruginous hawk, and northern harrier occurs in the Combined Survey Area. These species are discussed in Table 11 and not addressed further in the text. WBO, loggerhead shrike, MFTL, desert kit fox, and American badger are discussed in detail below. Non-listed special status wildlife species observations are shown in Figures 12 and 13 and are quantified in Table 13.

Western Burrowing Owl

WBO is designated as a Species of Special Concern (SSC; Priority 2 SSC) by CDFG due to rapid habitat loss and degradation from urbanization. Suitable WBO habitat consists of annual and perennial grasslands, deserts, and scrublands characterized by low-growing vegetation (Zarn 1974; CBOC 1993; Haug et al. 1993). Suitable WBO habitat may also include trees and shrubs if the canopy covers less than 30 percent of the ground surface (DeSante et al. 1996). Burrows are the essential component of WBO habitat, and both natural and artificial burrows provide protection, shelter, and nests for WBO. WBOs typically use burrows made by mammals such as kit foxes, ground squirrels, or badgers, but also may use human-made structures, such as cement culverts; cement, asphalt, or wood debris piles; or openings beneath cement or asphalt pavement (Collins and Landry 1977; Trulio 1994). Where the ranges of WBO and DT overlap, WBOs also use DT burrows.

WBOs in California are generally nonmigratory and most abundant in the Central and Imperial valleys, primarily in agricultural areas (Center for Biological Diversity et al. 2003). Small, scattered populations occur in the Mojave Desert. Although the WBO population in the southern desert region is primarily resident (i.e., present year-round), some migration from northern populations to this area occurs during winter (Center for Biological Diversity et al. 2003 citing Garrett and Dunn 1981). Seasonal nonmigration movements and shifts in burrow use by juveniles and adults within a region also occur. The West Mojave Plan documents 53 records of WBOs in the east Mojave Desert (Campbell 2004), only five of which are confirmed breeding pairs. Population density seems to be correlated with prey availability, particularly small mammals (Klute et al. 2003).

CNDDB reports 132 occurrences of WBO in Riverside County, concentrated in the west and west-central portions of the county. Prior to Project surveys conducted in 2010, and surveys conducted concurrently for the proposed Palen Solar Power Project (about 35 miles to the west of the BSPP), the only documented recent WBO occurrences in eastern Riverside County are located outside the Combined Survey Area near Blythe, California (cited by Center for Biological Diversity et al. 2003). As of 2002, Higson (cited by Center for Biological Diversity et al. 2003) characterized the WBO population near Blythe as “sparse” and estimated a maximum of 12 to 14 pairs in the summer and two wintering pairs. CNDDB reports six occurrences of WBO near Blythe; five were documented in 2002 and one was documented in 1987. The next closest records to the Combined Survey Area are approximately 22 miles to the west at the proposed Palen Solar Power Project site (two breeding pairs and their juveniles were documented during surveys conducted in 2009 by EDAW), and 80 miles to the west in west-central Riverside County.

This section is based on the survey results and discussion provided in the Burrowing Owl Technical Report from 2009 (EDAW AECOM 2009b) and 2010 (AECOM in prep).

The majority of the Combined Survey Area is considered suitable WBO foraging and nesting habitat, as assessed during 2009 and 2010, per Phase I of the CBOC protocol. Numerous burrows potentially suitable for use by WBO were detected and mapped throughout each Disturbance Area and 492-foot (150-meter) buffer. Potentially suitable burrows consisted of abandoned badger and kit fox burrows, DT burrows, and burrows of other unidentified fossorial mammals. A prevalence of small mammal burrows and a large arthropod population were noted during the Phase I assessment, indicating that a prey base for WBO is present.

Figures 18 and 19 display the locations of WBOs observed, active burrows (i.e., occupied by WBO), and other locations where sign or potential sign were observed during surveys in the Proposed Project BRSA and Reconfigured Alternative BRSA. Table 13 details the occurrences within the Proposed Project and Reconfigured Alternative BRSAs. One WBO was observed at a burrow during DT and WBO Phase II surveys on March 18, 2009, in the western-central area of the Proposed Project Study Area (Figure 18). This active burrow had abundant and recent WBO sign and was located adjacent to another burrow with sign; however, no WBOs were observed there subsequently during Phase III surveys. Because WBO breeding can be initiated as early as February, particularly in desert populations, it is unknown whether this WBO attempted to nest at this location in 2009 prior to initiation of focused Phase III surveys. On March 12, 2009, a second WBO was observed within the buffer near the western edge of the Combined Survey Area during vegetation surveys (Figures 18 and 19); this portion of the Combined Survey Area was outside the WBO Phase II and III survey area. During fall desert tortoise surveys in the Combined Survey Area, one WBO was observed within the buffer at an active burrow on October 23, 2009, and another at a different burrow on October 24, 2009. These two observations were made very near each other in the vicinity of the proposed substation (Figure 18). It is likely that the same individual WBO was observed on both days, but at two separate burrows. This portion of the Combined Survey Area was also outside the WBO Phase II and III survey area. No WBOs were documented within the Proposed Project Study Area (Figure 18) or 492-foot (150-meter) buffer during Phase III surveys, although signs of previous WBO use were present throughout these areas. One WBO was observed within the Reconfigured Alternative Survey Area during jurisdictional waters delineation surveys on April 1, 2010 (Figure 19). The individual was observed flying across a dirt access road in front of the surveyors' vehicle, but despite a search of the immediate area, no active burrow was found. No burrows with WBO sign were found in this area during Phase II or Phase III surveys, although this observation was made near the southern border of the Reconfigured Alternative Survey Area, and it is possible that an active burrow may have been located off site nearby. On May 12, 2010, another WBO was observed at a burrow during Phase II surveys. This active burrow had abundant and recent WBO sign and was located in the buffer around the transmission line (Figure 18). Subsequent Phase III surveys on May 12, 13, 14, and 17, 2010, only detected one WBO at this burrow. However, this individual was observed to be highly vigilant at the burrow site and was observed calling and looking into the burrow opening. This behavior is consistent with that of a breeding male guarding an incubating female that remains out of sight within the burrow. Although the breeding status of this individual WBO could not be confirmed during Phase III surveys, it is possible that the WBO was nesting at this location.

Four active WBO burrows were detected within the Combined Survey Area. A total of 90 burrows with various levels of WBO sign were detected in the Combined Survey Area during the Phase II and Phase III surveys. The Combined Survey Area is composed of either Sonoran creosote bush scrub, stabilized and partially stabilized desert dunes, desert dry wash woodland, creosote bush – big galleta grass association, or unvegetated ephemeral dry wash habitat, with desert pavement and cobble terraces in between. Vegetation within the desert dry wash woodland is composed primarily of creosote bush, ironwood, blue palo verde, and native annual grasses, while the desert scrub is predominantly vegetated with creosote bush. Suitable burrows were regularly distributed throughout most of the scrub habitat, which is relatively flat and sparsely vegetated and consists of loose sandy soils. Within the Combined Survey Area, burrows with signs of previous use by WBO are present at a relatively low density, but are regularly distributed across the Combined Survey Area except for the far western portion and southern portion containing the transmission corridor. The far western portion of each Disturbance Area, at the base of the adjacent mountains, is characterized by steep, rocky canyons, desert wash, and hard desert pavement and cobble terrace substrate, and contains few burrows suitable for nesting WBOs. This is probably due to the relative difficulty for fossorial mammals to excavate burrows in such a hard substrate. Despite the sparseness of suitable burrows in the western portion of each Disturbance Area, three suitable burrows in the southwestern portion of the Combined Survey Area, located within 100 feet of each other on the side of a steep, rocky canyon, had signs of heavy use by WBOs prior to the 2009 breeding season. The habitat in the southern portion of the Combined Survey Area within the transmission line corridor is of lower quality due to sandy soils, which make burrows more difficult to maintain.

The presence of inactive burrows with WBO sign, particularly those with abundant old sign, suggests that each Disturbance Area may have been used previously by WBO for breeding. Also, WBOs may use a range of different satellite burrows irregularly during the breeding and non-breeding seasons. Many of the suitable burrows appeared to have sign that was severely degraded and left in previous seasons, implying that the 90 burrows with sign represent multiple years of WBO use across the Combined Survey Area. The length of time that WBO sign can remain visible on the landscape is not known and is expected to vary with local precipitation, wind patterns, soil moisture, and other abiotic and biotic factors. Due to the generally dry conditions at the Combined Survey Area, WBO sign may persist for multiple seasons. The majority of these burrows also had relatively small amounts of WBO sign, indicating that either owls only used them for a brief period of time before vacating, or previous use may have been more extended or regular but much of the original sign has disappeared. If the small amount of sign at most burrows is a function of only temporary or infrequent use by WBOs, the Combined Survey Area may be used more during migration or other seasonal movements, or during winter.

A low density of WBO in the Combined Survey Area is consistent with the low documented general abundance of WBO in the surrounding region.

Loggerhead Shrike

During the avian point count surveys conducted in 2009, this species was found at low densities in the creosote bush scrub and habitat composed of both creosote bush scrub and desert dry wash woodland. Two nests were located in the buffer area, one just north of the Project Disturbance Area and Reconfigured Alternative Disturbance Area and the other was located within the buffer for the transmission line corridor (Figures 12 and 13). Table 13 details the occurrences within the Proposed Project and Reconfigured Alternative BRSAs. Suitable habitat for loggerhead shrike occurs throughout the Combined Survey Area, and it was the most common species recorded during the avian point count surveys.

The loggerhead shrike is a CDFG SSC. This species inhabits open, habitat types such as grasslands, old (fallow) fields, pastures, farmland, and desert scrub. For foraging, it requires perches of tall enough stature to overlook hunting areas, such as tree snags, stumps, and fenceposts. It also requires vegetation with thorns (or barbed-wire fences) for impaling their prey. Prey includes invertebrates and small vertebrates, including small mammals, birds, and reptiles. While this species has been in steady decline throughout much of its range, beginning in the northeast in the 1930s and in the southeast and midwest by the 1960s, it was still fairly common in California as late as 1970. It showed significant declines in most of California beginning around 1968 (Sauer et al. 2005); however, in the southern California deserts, it has shown no marked decline (Shuford and Gardali 2008). Loggerhead shrikes remain on permanent territories throughout the year. Outside of the breeding season, males and females defend neighboring territories, which coalesce at the beginning of the nesting period.

American Badger

American badger dens and mammal burrows showing evidence of predation by American badger were observed throughout the Combined Survey Area, and this activity is higher on the western portion of the Combined Survey Area (Figures 12 and 13). Table 13 details the occurrences within the Proposed Project and Reconfigured Alternative BRSAs. Prey species for American badgers are present and prevalent (round-tailed ground squirrels, kangaroo rats, mice, etc.), and observations of badgers digging into kit fox burrows and complexes were made). Most of the Proposed Project BRSA and the Reconfigured Alternative BRSA, with the exception of agricultural and developed land, is suitable for this species.

The American badger, a CDFG SSC, is a resident of level, open areas in grasslands, agricultural areas, and open shrub habitats. It digs large burrows in dry, friable soils and feeds mainly on fossorial mammals: ground squirrels, gophers, rats, mice, etc. Badgers are primarily active during the day but may become more nocturnal in proximity to humans. The home range of badgers has been measured to be 1,327 to 1,549 acres for males and 338 to 751 acres for females in Utah (Lindzey 1978) and 400 to 600 acres in Idaho (Messick and Hornocker 1981). Mating occurs in late summer or early fall, and two to three young are born 183 to 265 days later in March or April (Long 1973). Badgers are known to live up to 11 to 15 years (Messick and Hornocker 1981).

Based on the distribution of burrows and burrows showing evidence of recent predation by badgers (claw marks), this species is using the western portion of the Project Disturbance Area more heavily than the eastern portion. What is interesting to note is that the western areas actually had less small mammal activity than the eastern areas. Coyote activity was noted more commonly in the eastern areas. It could be that water is a limiting factor for badgers, as presumably water is more available and for a longer period in the western portions of the Proposed Project BRSA and the Reconfigured Alternative BRSA. Also, the few occurrences of badger activity noted in the east were in the vicinity of McCoy Wash, where water is likely more available than within the central portion of the Project Disturbance Area.

Desert Kit Fox

Active desert kit fox burrows and complexes were found scattered throughout the Combined Survey Area (Figures 12 and 13). Table 13 details the occurrences within the Proposed Project and Reconfigured Alternative BRSAs. The burrows were observed within drainages and in open areas, with a slightly lower abundance of kit fox burrows observed in the areas with a lot of desert pavement. Fewer small mammal burrows and kit fox burrows were noted in desert pavement areas, presumably because it is more difficult to excavate burrows there. A suitable prey base and habitat to support this species occur throughout the BRSA, with the exception of agricultural and developed land.

The desert subspecies of kit fox is a Protected Fur-bearing Mammal. Suitable habitat for this fossorial mammal consists of arid open areas, shrub grassland, and desert ecosystems. Kit fox diet consists mostly of small rodents, especially kangaroo rats. Kit foxes will also eat rabbits, lizards, insects, and berries. Dens have multiple entrances and entrances are up to 8 inches wide, and often keyhole-shaped. Litters of three to five young are born in February or March (Egoscue 1962; McGrew 1979).

Mojave Fringe-Toed Lizard

The MFTL is a CDFG SSC and is considered sensitive by BLM. MFTLs were observed throughout the sand dune habitat south of I-10 (Figure 20). The documented distribution of this species shown in the figure roughly outlines the suitable habitat, approximately 380 acres, present within the Proposed Project Study Area for this species. There is no MFTL habitat within the Reconfigured Alternative Disturbance Area for this species. Table 13 details the occurrences within the Proposed Project and Reconfigured Alternative BRSAs. A majority of the suitable habitat present within the Proposed Project Study Area for this species is invaded by Saharan mustard. Although Saharan mustard is an invasive species, on several occasions MFTLs were noted climbing in the Saharan mustard and eating the plant's seeds.

MFTLs require fine, Aeolian sand. MFTLs can be found in both large and small dunes, margins of dry lakebeds and washes, and isolated dune pockets against hillsides (Stebbins 1944, 1985; Smith 1946; Norris 1958), generally within creosote scrub desert habitat (Norris 1958; Stebbins 1985). Shade from plants may be necessary for thermoregulatory burrowing (Muth 1991). MFTLs are therefore dependent on loose, windblown sand habitat. Disruption of the dune ecosystem, including source sand, wind transport, or sand transport corridors, poses a threat to the habitat needed for MFTL. Preservation of sand dune ecosystems, including their source sand and sand corridors, is necessary for the long-term survivorship of Aeolian sand specialists such as MFTLs (Barrows 1996).

3.5 CRITICAL HABITAT

The Combined Survey Area does not contain any designated critical habitat for special status plant or wildlife species.

3.6 WILDLIFE MOVEMENT

The Combined Survey Area could be used by a variety of wildlife species for movement purposes. Wildlife movement activities typically fall into one of three movement categories: 1) dispersal (e.g., juvenile animals from natal areas, or individuals extending range distributions); 2) seasonal migration; and 3) movements related to home range activities (foraging for food or water, defending territories, searching for mates, breeding areas, or cover).

Regionally, the Combined Survey Area is located to the east of the McCoy Wilderness (McCoy Mountains) and immediately west of the Colorado River within the NECO planning area of the

California Desert Conservation Area (CDCA). The purpose of NECO and the other concurrent management plans is to provide a regional approach to managing desert ecosystems. The NECO planning area consists of a series of desert wildlife management areas (DWMAs) for the Federal endangered DT and wildlife habitat management areas (WHMAs). The Combined Survey Area is also in proximity to several other similar management areas. The intention of these areas is to protect habitats assumed to be suitable for many species and therefore preserve biodiversity. The westernmost portion of the buffer is part of the bighorn sheep WHMA (Figure 21).

There are washes meandering eastward into the project site from the McCoy Mountains west of the Combined Survey Area. Wildlife using the washes for local movement include coyote (*Canis latrans*), fox (desert kit fox [*Vulpes macrotis arsipus*] or gray fox [*Urocyon cinereoargenteus*]), bobcat (*Lynx rufus*), domestic dog (*Canis familiaris*), DT, woodrat (*Neotoma* sp.), and wild burros (*Equus asinus*). These washes likely support local movement of wildlife species between the valley floor and McCoy Mountains to the west, since they provide additional cover as compared to adjacent upland areas (i.e., desert pavement). The upland areas between the washes have very little vegetation and most of the vegetation present in the Combined Survey Area is in the washes. The washes have also created ravines that provide added cover for wildlife. Although these washes are important locally for movement, they are likely less important to regional movement due to the wide agricultural corridor along the Colorado River to the east and the presence of the I-10 highway corridor to the south.

The Combined Survey Area is located in an area that could support local dispersal opportunities for special status species, including DT and Nelson's bighorn sheep. DT and Nelson's bighorn sheep may move from the southwest to northeast or vice versa as part of local movement patterns. DT home range varies with locality, year, resource availability, and social interactions (Berry 1986; O'Connor et al. 1994). Male DT home range (0.04 to 0.31 square mile) is estimated to be twice the size of females (Burge 1977; Berry 1986). DTs use multiple dens throughout individual home ranges and appear to migrate to steeper, rockier slopes in the winter (Barrett 1990). DT dispersal distances are documented at 4.1 miles.

There is no evidence of use of the site by Nelson's bighorn sheep, a CDFG fully protected and BLM sensitive species. Populations of bighorn sheep within individual mountain ranges are often small, and there is typically considerable movement between mountain ranges (Bleich et al. 1990). These intermountain movements are particularly important to long-term population viability. Resources within the Combined Survey Area would be limited for bighorn sheep as there is no permanent source of water within the Combined Survey Area.

The intermountain areas of desert (valley floor) where the Combined Survey Area occurs could potentially serve as a seasonal and dispersal movement area for Nelson's bighorn sheep. If bighorn sheep were to use the Combined Survey Area, the main resource for bighorn sheep would be forage during the spring months. Due to a lack of permanent nearby water, bighorn sheep would only be able to use the Project site on a seasonal basis. Bighorn sheep must have a source of permanent water within their home range. Although one may exist in the nearby McCoy and Big Maria and Little Maria Mountains, none was recorded or documented by Project biologists during any of the biological surveys conducted within the Combined Survey Area.

Therefore, there is a potential for bighorn sheep to use the Combined Survey Area for seasonal foraging based on water availability, but not as a regular part of their home range.

3.7 LAWS, ORDINANCES, REGULATIONS, AND STANDARDS

This section discusses the laws, ordinances, and regulations (LORS) related to biological resources within the Project Disturbance Area.

3.7.1 LORS Compliance

The Proposed Project will comply with applicable Federal, State, and local LORS throughout Project construction and operation. Potentially applicable LORS are summarized in Table 14 and discussed in Sections 3.7.2 through 3.7.4.

Table 14
LORS Applicable to the Proposed Project

LORS	Applicability
Federal	
Endangered Species Act of 1973 (ESA), 16 USC Section 1531 et seq., and implementing regulations, Title 50 CFR Section 17.1 et seq.	Designates and protects Federal threatened and endangered plants and animals and their critical habitat. Requires Federal agency consultation with USFWS and issuance of Biological Opinion and incidental take authorization for listed species.
Migratory Bird Treaty Act (MBTA), 16 USC Sections 703-712	Prohibits take of protected migratory birds.
Clean Water Act (CWA), 33 U.S.C. Section 1251 et seq.	Restore and maintain the chemical, physical, and biological integrity of the nation's waters and regulate the discharge of pollutants and dredged or fill material to the navigable waters of the United States.
NEPA, 42 USC Section 4321 et seq., and implementing regulations 40 CFR 1500-1508	Requires Federal agencies to analyze environmental impacts of proposed actions with a Federal nexus and to disclose impacts to the public.

LORS	Applicability
NECO Management Plan	Protects and conserves natural resources while simultaneously balancing human uses of the California portion of the Sonoran Desert ecosystem.
California Desert Conservation Area (CDCA) Plan	Under the Federal Land Policy and Management Act, BLM is required to develop Resource Management Plans. All activities proposed for public land must be consistent with the approved Resource Management Plan(s).
State	
CEQA (Public Resources Code Section 15000 et seq.)	CEQA requires identification of significant environmental effects of proposed projects (including impacts on biological resources) and avoidance (where feasible) or mitigation of the significant effects. CEQA applies to "projects" proposed to be undertaken or requiring approval by State and/or local governmental agencies. "Projects" are activities that have the potential to have a physical impact on the environment. The CEC licensing process, under the Warren-Alquist Act, is a CEQA-equivalent process.
CESA of 1984, Fish and Game Code Sections 2050 – 2098	Protects California's endangered and threatened species, including species designated as candidates for listing.
CFGC Fully Protected Species: Section 3503, 3503.5, 3511: Fully protected birds Section 4700: Fully protected mammals Section 5050: Fully protected reptiles and amphibians Section 5515: Fully protected fishes	Prohibits the taking of listed plants and animals that are classified as "Fully Protected" in California.
Native Plant Protection Act of 1977, CFGC Section 1900 et seq.	Provides specific protection measures for identified populations of State rare and endangered plants.
Title 14 CCR Sections 670.2 and 670.5	Listings of plants and animals of California declared to be threatened or endangered.
CFGC Section 1600 et seq., Streambed Alteration Agreement (SAA)	Requires the CDFG to review project impacts to waters of the State (bed, banks, channel, or associated riparian areas of a river, stream, or lake), including impacts to wildlife and vegetation from sediments, diversions, and other disturbances.
The 1969 Porter-Cologne Water Quality Control Act (Porter-Cologne) California Water Code (CWC) Section 13000 et seq.	Regulates discharges of waste and fill material to waters of the State, including "isolated" waters and wetlands.
Local	
Riverside County General Plan (2003)	Provides land use designations, goals, and policies for the development and conservation of land within the unincorporated areas of Riverside County.

Note: There are no Federal waters within the BRSA.

3.7.2 Federal LORS

Federal LORS that are applicable to the BSPP are discussed below.

Endangered Species Act (ESA) (16 USC Sections 1531 et seq.). This 1973 law, administered by USFWS, is designed to minimize impacts to imperiled plants and animals, as well as facilitate

recovery of such species. Declining plant and animal species are listed as "endangered" or "threatened" based on a variety of factors. Applicants for projects requiring Federal agency action that could adversely affect listed species are required to consult with and mitigate impacts in consultation with USFWS. Adverse impacts are defined as "take" ("to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, collect, or attempt to engage in such conduct"), which is prohibited except as authorized through consultation with USFWS and issuance of an Incidental Take Statement under Section 7 or Section 10 of the ESA, depending on whether there is a federal nexus (Federal permit required or funding involved). The BSPP requires BLM to issue an ROW grant, providing a Federal nexus. Therefore, the BSPP will conduct the ESA consultation process under Section 7.

Migratory Bird Treaty Act (MBTA) (16 USC Sections 703–711). This law prohibits actions resulting in the pursuit, capture, killing, and/or possession of any protected migratory bird, nest, egg, or parts thereof. USFWS maintains a list of designated migratory birds occurring in various regions of the United States. This regulation can constrain construction activities that have the potential to affect nesting birds either through vegetation removal and land clearing or other construction or operation-related disturbance.

Clean Water Act (CWA) Through formal field surveys following the latest established Federal protocol and guidance documents for delineating jurisdictional waters of the United States, including hydrological investigation and analysis, the Project team determined that the disturbance areas do not support jurisdictional waters of the United States. It is anticipated that the USACE will not assert jurisdiction over any waters and/or aquatic features occurring within the disturbance area. Final acreages of jurisdictional waters of the United States will be based on the Approved JD process per the March 30, 2007, USACE Jurisdictional Determination (JD) Form Guidebook; the June 5, 2007, Approved JD Form; the June 5, 2007, Joint Guidance Memorandum; the December 2, 2008, Guidance Memorandum; or Regulatory Guidance Letter (RGL) 08-02 (if RGL 08-02 is deemed applicable and appropriate [i.e., the permit applicant, or other "affected party" can decline to request and obtain an Approved JD and elect to use a Preliminary JD instead]).

National Environmental Policy Act (NEPA) 1969 (42 USC 4321 et seq.) NEPA established a national policy for promoting environmental protection that includes a multidisciplinary approach to considering environmental effects in decision making intended to "encourage productive and enjoyable harmony between man and his environment; to promote efforts which will prevent or eliminate damage to the environment and biosphere and stimulate the health and welfare of man…"

NEPA requires Federal agencies to analyze and publicly disclose of the environmental impacts of a proposed project. To do so, Federal agencies are required to prepare either an Environmental Assessment (EA) or, where an action may significantly affect the quality of the human environment, an Environmental Impact Statement (EIS). These documents explore project alternatives and identify the likely environmental consequences of each action. These documents contain statements of the environmental impacts and include mitigation measures to lessen the effects of a proposed project to the extent practicable. The significance of an impact is determined by both its context and its intensity. "Context" includes society as a whole, the affected region, the affected interests, and the locality. "Intensity" refers to the severity of impact, including "the degree to which the action may adversely affect an endangered or threatened species or habitat that has been determined to be critical under [ESA]." Based on the potential for significant environmental impacts, it is anticipated that BLM would be required to prepare an EIS for the BSPP to satisfy NEPA.

Northern and Eastern Colorado Desert Coordinated Management Plan (BLM 2002). The Federal Land Policy and Management Act (FLPMA) requires BLM to develop land use plans also known as Resource Management Plans to guide BLM's management of public land. BLM is required to determine conformity of the project developments with the CDCA including NECO. NECO is a landscape-scale, multiagency planning effort that protects and conserves natural resources while simultaneously balancing human uses of the California portion of the Sonoran Desert ecosystem. This plan was prepared under the regulations implementing the FLPMA of 1976. NECO provides reserve management for the DT, integrated ecosystem management for special status species and natural communities for all Federal lands, and regional standards and guidelines for public land health for the BLM lands.

The BSPP buffer occurs within a Multi-Species WHMA, as designated by NECO (Figure 21). The Multi-Species WHMA is complementary to existing restricted areas within the NECO planning area and DWMAs, which also cover other special status species and habitats (e.g., DT and bighorn sheep). No restrictions are designated in the WHMA other than closure of some routes of travel. Management emphasis is placed on active management, specific species and habitats mitigation, and restoration from authorized allowable uses. The special situation of "fixed-point" rare plants is also addressed.

California Desert Conservation Area (CDCA) Plan. Per Title 43 CFR Section 1610.5-3, BLM must manage the land within its jurisdiction in compliance with a Resource Management Plan. With the exception of one 40-acre, privately owned parcel, the entire Project site (including the transmission line route) will be located on lands under BLM jurisdiction and managed pursuant

to the CDCA Plan. The CDCA Plan serves as a guide for the management of all BLM-administered lands in three desert areas: the Mojave, the Sonoran, and a small portion of the Great Basin. The CDCA Plan covers approximately 25 million acres, of which 12 million are public lands. The primary goal of the CDCA Plan is to provide overall maintenance of the land while planning for multiple uses and balancing the needs of people with the protection of the natural environment.

3.7.3 State LORS

The following are State LORS that are applicable to the Proposed Project.

California Environmental Quality Act (CEQA) (Public Resources Code Section 15000 et seq.). CEQA requires identification of significant environmental effects of proposed projects (including impacts on biological resources) and avoidance (where feasible) or mitigation of the significant effects. CEQA applies to "projects" proposed to be undertaken or requiring approval by State and/or local governmental agencies. "Projects" are activities that have the potential to have a physical impact on the environment. The CEC licensing process, under the Warren-Alquist Act, is a CEQA-equivalent process.

California Endangered Species Act (CESA) (Fish and Game Code Section 2050 et seq.). This State law prohibits the "take" (defined as "to hunt, pursue, catch, capture, or kill") of State-listed species except as otherwise provided in State law. CESA, administered by CDFG, is similar to the Federal ESA, although unlike the Federal law, CESA applies incidental take prohibitions to species currently petitioned for State-listing status (i.e., candidate species). State lead agencies are required to consult with the CDFG to ensure that their authorized actions are not likely to jeopardize the continued existence of any State-listed species or result in the degradation of occupied habitat.

Under Section 2081, the CDFG authorizes "take" of State-listed endangered, threatened, or candidate species through incidental take permits or memoranda of understanding if 1) the take is incidental to otherwise lawful activities, 2) impacts of the take are minimized and fully mitigated, 3) the permit is consistent with regulations adopted in accordance with any recovery plan for the species in questions, and 4) the applicant ensures suitable funding to implement the measures required by CDFG.

Because DT are present in areas associated with the Proposed Project, the Project will obtain either a Section 2081 permit for DT, or a CDFG concurrence under CESA Section 2080.1 with the Federal take authorization issued by the USFWS for DT under the Federal ESA (described in

Section 3.7.2). If only Federal take authorization is pursued, it is assumed, with concurrence from CDFG, that this process will substantially meet the requirements of CESA.

California Fish and Game Code Section 3503. This Code prohibits take, possession, or needless destruction of the nests or eggs of any bird, except as otherwise provided by the code or any regulation made pursuant thereto.

California Fish and Game Code Section 3503.5. The CFGC makes it unlawful to take, possess, or destroy birds of prey. It also prohibits the take, possession, or destruction of nests or eggs of any bird of prey.

California Fish and Game Code Section 3511. This law describes bird species, primarily raptors, that are "fully protected." Fully protected birds may not be taken or possessed, except under specific permit requirements.

California Fish and Game Codes Sections 4700, 5050, and 5515. These CFGCs list mammal, amphibian, and reptile species that are classified as fully protected in California.

Native Plant Protection Act (CFGC Section 1900 et seq.). The Native Plant Protection Act includes measures to preserve, protect, and enhance rare and endangered native plant species. Definitions for "rare and endangered" are different from those contained in CESA, although CESA-listed rare and endangered species are included in the list of species protected under the Native Plant Protection Act.

Title 14, California Code of Regulations Sections 670.2 and 670.5. This CCR lists plant and animal species designated as threatened and endangered in California. SSC is a category applied by CDFG to those species that are indicators of regional habitat changes or are considered potential future protected species. CSCs do not have any special legal status, but are intended by CDFG for use as a management tool to take these species into special consideration when decisions are made concerning the future of any land parcel.

California Fish and Game Code Section 1600 et seq. Pursuant to these sections, CDFG regulates all changes to the natural flow, bed or bank, of any river, stream, or lake that support fish or wildlife resources. A stream is defined broadly as a body of water that flows at least periodically, or intermittently, through a channel that has banks and that supports fish or other aquatic biota. Such areas are formally referred to as "waters of the State." Impacts to vegetation and wildlife from sediment, diversions, and other disturbances are included in the review.

Project proponents must provide CDFG with written notification before activities begin that will do the following:

- Substantially divert or obstruct the natural flow of any river, stream, or lake;
- Substantially change or use any material from the bed, channel, or bank of any river, stream, or lake; or
- Deposit or dispose of debris, waste, or other material containing crumbled, flaked, or ground pavement where it can pass into any river, stream, or lake.

Notification is generally required for any activity that will take place in or in the vicinity of a river, stream, lake, or their tributaries. This includes rivers or streams that flow at least periodically or permanently through a bed or channel with banks and support fish or other aquatic life, and watercourses having a surface or subsurface flow that support or have supported riparian vegetation. Generally, CDFG is concerned with activities that have the potential to impact State-regulated resources at the activity site, as well as the effects of those actions on the ecosystem at and surrounding the activity (i.e., upstream, downstream, and neighboring). As the Project Disturbance Area contains "waters of the State," the Project will submit a CFGC Section 1600 et seq. Lake and Streambed Alteration Agreement (SAA) notification to CDFG. The SAA review process is subsumed within the CEC's review and approval process for the AFC.

1969 Porter Cologne Water Quality Control Act (Porter-Cologne) (California Water Code Section 13000 et seq.). Through a programmatic agreement between the Federal government and the States, the Regional Water Quality Control Board (RWQCB) has primary authority for permit and enforcement activities under Porter-Cologne) and the CWA. Under Porter-Cologne, the RWQCB regulates the "discharge of waste" to waters of the State. The term "discharge of waste" is also broadly defined in Porter-Cologne, such that discharges of waste include fill, any material resulting from human activity, or any other "discharge" that may directly or indirectly impact waters of the State relative to implementation of Section 401 of the CWA.

Porter-Cologne authorizes the RWQCB to regulate discharges of waste and fill material to waters of the State, including "isolated" waters and wetlands, through the issuance of waste discharge requirements (WDRs). Under Porter-Cologne, all parties proposing to discharge waste that could affect the quality of waters of the State, other than into a community sewer system, shall file with the appropriate RWQCB Report of Waste Discharge (ROWD) containing such information and data as may be required by the RWQCB. The RWQCB will then respond to the ROWD by issuing a WDR in a public hearing, or by waiving WDRs (with or without conditions) for that proposed discharge. The RWQCB has a statutory obligation to prescribe WDRs except

where the RWQCB finds that a waiver of WDRs for a specific type of discharge is in the public interest. Therefore, all parties proposing to discharge waste that could affect waters of the State, but do not affect Federal waters (which requires a CWA Section 404 permit and CWA Section 401 Certification) must file an ROWD with the appropriate RWQCB.

3.7.4 Local LORS

Riverside General Plan, Land Use, and Multi-Purpose Open Space Elements (2003). Riverside County requires actions to ensure that proposed development projects demonstrate a high degree of compatibility with any threatened or endangered species habitat they may affect. The administering agency is the Riverside County Planning Department.

3.7.5 Involved Agencies

The Federal, State, and local agencies involved in biological resource issues related to the BSPP are provided in Table 15. Copies of correspondence with agency personnel are provided in Attachment H.

Table 15
Agencies and Agency Contacts

Agency Contact	Phone/E-mail	Permit/Issue
Holly Roberts, Deputy Field Manager Bureau of Land Management Palm Springs South Coast Field Office 690 W. Garnet Ave., P.O. Box 581260 North Palm Springs, CA 92258-1260	(760) 251-4800 phone Holly_roberts@ca.blm.gov	Right-of-Way Permit and preparation of EIS per NEPA
Jim Bartel, Field Supervisor USFWS Carlsbad Office 6010 Hidden Valley Road, Suite 101 Carlsbad, CA 92011	(760) 431-9440 Jim_Bartel@fws.gov	Federal ESA, Section 10 Consultation – Habitat Conservation Plan
Chris Hayes, Program Manager CDFG Blythe Office P.O. Box 2160 Blythe, CA 92226	(760) 922-6508 CHayes@dfg.ca.gov	Section 2081 Take Permit
Stephan Arvender CDFG Blythe Office P.O. Box 2160 Blythe, CA 92226	(760) 922-6783 SArvender@dfg.ca.gov	Streambed Alteration Agreement, Section 1600
Dan Swenson, Senior Project Manager USACE Regulatory Division 915 Wilshire Blvd Los Angeles, CA 90017-3401	(213) 452-3414 dan.swenson@usace.army.mil	Concurrence that Proposed Project site does not include “waters of the United States”

3.7.6 Required Permits and Permit Schedule

As shown in Table 16, the Proposed Project may require several permits that are specific to biological resources issues.

Table 16
Required Biological Resource Permits and Permitting Schedule

Permit/Approval	Schedule
Federal Endangered Species Act, Section 7 Consultation	Section 7 Consultation will be initiated by BLM to obtain a Biological Opinion from USFWS for the Project. Section 7 consultation for this Project is triggered by a ROW Application to BLM from the Applicants. A Biological Assessment (BA) for the Project's effect on DT will be prepared and submitted to BLM and USFWS to initiate formal consultation. It is anticipated that the Draft BA will be submitted in January 2010. Once the Final BA is submitted by BLM, the 135-day consultation period with USFWS begins.
California Endangered Species Act, Incidental Take (2081) Permit	CDFG will be invited to participate in the Section 7 consultation with USFWS regarding species protected under both the ESA and the CESA. For this Project, DT is the only State-listed species detected on site. If CDFG agrees with the conditions of the Biological Opinion, CDFG will issue a concurrence letter within a few weeks of issuance of the Biological Opinion. If the Project determines that pursuing the 2081 is more appropriate, the Draft 2081 would be submitted in January 2010. Once the Final 2081 Individual Take Permit is submitted, CDFG provides its determination to CEC and 2081 Individual Take Permit take authorization is included in the CEC Decision Document. A separate 2081 Individual Take Permit will not be issued by CDFG.
CDFG 1602 Lake and Streambed Alteration Agreement (SAA)	CDFG regulates activities that would alter the flow, bed, channel, or bank of streams and lakes. As conditional to this permit, mitigation will be required. Mitigation for unavoidable permanent impacts to jurisdictional waters within the Project Disturbance Area or the Proposed Project or Reconfigured Alternative could be mitigated via a combination of methods. The mitigation could occur in the form of approved mitigation bank credits, an approved in-lieu fee program, conservation easement(s), and/or jurisdictional habitat creation-restoration (that results in a net increase in jurisdictional habitat acreage), enhancement, or creation-restoration combined with enhancement; however, the mitigation could not result in a net loss of jurisdictional habitat or wetland functions and values. Project compliance with State policy, i.e., California Wetlands Conservation Policy (EO W-59-93), provides for "no overall net loss" of wetlands and achieving a "long-term net gain in the quantity, quality, and permanence of wetlands acreage and values in California." Therefore, a minimum 1:1 creation-restoration ratio would be applied toward any impacts to jurisdictional waters. Project-specific mitigation ratios would be developed in consultation with CDFG. As a requirement of the 1602 permit application, the development of a conceptual mitigation, maintenance, and monitoring plan would be required for the mitigation, which is a requirement of both the State 1602 permit applications. This plan should include details regarding site preparation (e.g., grading), planting specifications, and irrigation design, as well as maintenance and monitoring procedures. The plan should outline yearly success criteria and remedial measures should the mitigation effort fall short of the success criteria. Any riparian mitigation that cannot be achieved through onsite

Permit/Approval	Schedule
	creation-restoration and enhancement should be performed off site, typically per agency guidance within the same hydrologic unit (watershed) where impacts occur. Alternatively, the mitigation obligations may also be satisfied by participating in a fee-based mitigation program through a wetland mitigation bank. The proposed mitigation is subject to the resource agencies' review and discretion; thus, the mitigation obligations for the impacts to jurisdictional wetland habitats may change from those recommended here. The SAA application will be submitted to CDFG approximately 3 months after the AFC submittal. CDFG provides its determination to CEC, and SAA authorization is included in the CEC Decision Document. A separate SAA will not be issued by CDFG.
RWQCB Waste Discharge Requirement	The RWQCB regulates the "discharge of waste" to waters of the State (CWC Section 13050[e]). The definition of the waters of the State is broader than that for waters of the United States in that all waters are considered to be a water of the State regardless of circumstances or condition. The term "discharge of waste" is also broadly defined in Porter-Cologne, such that discharges of waste include fill, any material resulting from human activity, or any other "discharge" that may directly or indirectly impact waters of the State. As conditional to this permit, best management practices (BMPs) will be required to ensure compliance with State water quality standards. BMPs can also be specified by the RWQCB, based on the report of waste discharge (ROWD) (filed with the appropriate RWQCB by the applicant), which is authorized to regulate discharges of waste and fill material to waters of the State (including "isolated" waters and wetlands), through the issuance of a WDR (CWC Section 13263). WDRs are commonly issued based on the threshold of allowable pollutants into waters of the State. Under Porter-Cologne, all applicants proposing to discharge waste that could affect the quality of waters of the State, other than into a community sewer system, shall file with the appropriate RWQCB an ROWD containing such information and data as may be required by the RWQCB (CWC Section 13260[a]). The RWQCB will then respond to the ROWD by issuing a WDR in a public hearing, or by waiving WDRs (with or without conditions) for that proposed discharge. The RWQCB has a statutory obligation to prescribe WDRs, except where RWQCB finds that a waiver (with or without conditions) of WDRs for a specific type of discharge is in the public interest. Therefore, all parties proposing to discharge waste that could affect waters of the State, but do not affect Federal waters (which requires authorization under CWA Section 404 and certification under CWA Section 401 must file an ROWD with the appropriate RWQCB prior to issuance of the WDR.

CHAPTER 4
IMPACTS

This section addresses Project-related impacts on vegetation communities and special status plant and wildlife species during both Project construction and operation. Direct and indirect impacts may be either permanent or temporary. These impact categories are defined below.

- Direct: Direct impacts are caused by the Proposed Project or Reconfigured Alternative and occur at the same time and place. Any alteration, disturbance, or destruction of biological resources that would result from Project-related activities is considered a direct impact. Direct impacts would include direct losses to native habitats, potential jurisdictional waters, wetlands, and sensitive species, and diverting natural surface water flows. Specifically, direct impacts may include injury, death, and/or harassment of listed and/or sensitive species. Direct impacts may also include the destruction of habitats necessary for species breeding, feeding, or sheltering. Direct impacts to plants can include crushing of adult plants, bulbs, or seeds.

- Indirect: As a result of Project-related activities, biological resources may also be impacted in a manner that is not direct. Indirect impacts may occur later in time or at a place that is farther removed in distance than direct impacts, but are still reasonably foreseeable and attributable to Project-related activities. Examples include habitat fragmentation; elevated noise, dust, and lighting levels; soil compaction; increased human activity; decreased water quality; changes in hydrology, runoff, and sedimentation; and the introduction of invasive wildlife and plants.

- Permanent: All impacts that result in the long-term or irreversible removal of biological resources are considered permanent. Examples include constructing a building or permanent road on an area containing biological resources. All direct impacts in the Project Disturbance Area and Reconfigured Alternative Disturbance Area are considered permanent.

- Temporary: Any impacts considered to have reversible effects on biological resources can be viewed as temporary. Examples include the generation of fugitive dust during construction, or removing vegetation for underground pipeline trenching activities and either allowing the natural vegetation to recolonize or actively revegetating the impact area. Surface disturbance that removes vegetation and disturbs the soil typically would be considered a long-term temporary impact if vegetation is allowed to reestablish overtime.

However, because of the very slow natural recovery in arid ecosystems (such as those present on the Project site and vicinity) and the altered surface hydrology for the planned rerouted wash, all such impacts in the Project Disturbance Area and Reconfigured Alternative Disturbance Area are considered permanent.

For the purpose of this analysis, the following applicable thresholds of significance have been used to determine whether implementing the Proposed Project or Reconfigured Alternative would result in a significant impact. These thresholds of significance are based on Appendix G of the State CEQA Guidelines and also support a NEPA determination. A biological resources impact is considered significant if implementation of the Proposed Project or Reconfigured Alternative would do any of the following:

- Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by CDFG or USFWS;
- Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, or regulations or by CDFG or USFWS;
- Have a substantial adverse effect on Federal protected wetlands as defined by Section 404 of the CWA (including, but not limited to, marshes, vernal pools, and coastal areas) or any State-protected jurisdictional areas not subject to regulation under Section 404 of the CWA through direct removal, filling, hydrological interruption, or other means;
- Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites;
- Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy, or ordinance;
- Conflict with the provisions of an adopted habitat conservation plan; natural community conservation plan; or other approved local, regional, or State habitat conservation plan; or
- Substantially reduce the habitat of a fish or wildlife species; cause a fish or wildlife population to drop below self-sustaining levels; threaten to eliminate a plant or animal community; or substantially reduce the number or restrict the range of an endangered, rare, or threatened species.

4.1 BIOLOGY-RELATED DESIGN ELEMENTS

The following sections summarize some of the key Project elements as they are used in the biological resources investigation discussion below.

4.1.1 Proposed Project BRSA

It is assumed that the entire 7,025-acre Project Disturbance Area would be directly and permanently impacted by the BSPP. Since final placement and development of the substation would be the responsibility of the Southern California Edison (SCE), all impacts to the substation would be the responsibility of SCE. As such, impacts to the substation are not discussed in this document.

Solar Array, Access Roads, and Maintenance Facilities

Two of the solar fields associated with the Proposed Project would occupy 1,600 acres each, while the other two would occupy 1,200 acres each. The total area occupied by facility footprint (i.e., area within the fence line, including the solar fields, office and maintenance buildings, lay-down area, drainage channels, bioremediation area, leach fields,) is included within the 7,025-acre Project Disturbance Area.

BSPP plans to construct two 4-acre evaporation ponds in each power block. The plant will utilize one of the two ponds for approximately 24 months, and then switch to the other. When one pond requires maintenance or solids removal, BSPP can still operate with the other pond. The evaporation ponds will be double-lined and will meet all applicable regulatory requirements for surface impoundments and will be covered with narrow-mesh netting to prevent access by ravens and migratory birds.

The minimum number of lights necessary to provide safety and security will be installed in the power block. All lights will be installed within the perimeter fence of the project. Lights will be focused downward and shielded toward the power block, away from adjacent undeveloped areas when near the perimeter of the site.

Rerouted Desert Washes

The following summary of existing drainage patterns and planned modifications is based on material described in greater detail in the Hydrology Report (AECOM 2009c).

The drainage modifications to the Proposed Project seek to replicate as nearly as possible the existing flow patterns for the drainages as they exit the site (Figure 22). For this reason, five channels have been proposed adjacent to, through, or across the site as shown in Figure 22. These channels would intercept flows prior to their entry to the site and convey them in realigned channels to approximately the same locations where they exit the site under existing conditions. Outlets for each channel would end in diffusers.

The following portions of the drainage channels would be located outside of the facility's security fence: the entire channel north of Solar Units 1 and 2, including the end diffuser; the entire channel south of Solar Unit 4; and the portions of the channel located west of the northwest power unit (Unit 2) and southwest power unit (Unit 3). The remaining portions of the drainage channels would be located inside of the security fence.

The channels would be constructed with 3:1 horizontal to vertical slopes using native material, and scour protection (e.g., soil-cement) would be added to the channel sides and bottoms in stress areas such as curves and slope transitions. Soil-cement, or similar material, would be required in high velocity (potentially erosive areas) such as drop structure, inlet structures, turns and the inlet channel face on the west. No scour protection is proposed for the channel bottom in the straight sections of the channels. This is to allow the low flows to meander across the bottom, replicating as nearly as possible the flow regimes under current conditions.

4.1.2 Reconfigured Alternative BRSA

It is assumed that the entire 5,548-acre Reconfigured Alternative Disturbance Area would be directly and permanently impacted by the BSPP.

Solar Array, Access Roads, and Maintenance Facilities

The 5,548-acre Reconfigured Alternative Disturbance Area provides sufficient area for construction of four solar power blocks only. It does not include areas for access roads, staging, office and management facilities, staging area, land treatment unit, dry wash rerouting, water supply, transmission lines, or a substation.

It is assumed that BSPP would construct two 4-acre evaporation ponds in each power block for the Reconfigured Alternative as required for the Proposed Project.

Additionally, as for the Proposed Project, it is assumed the minimum number of lights necessary to provide safety and security will be installed in the power block. All lights will be installed within the perimeter fence of the Project. Lights will be focused downward and shielded toward the power block, away from adjacent undeveloped areas when near the perimeter of the site.

Rerouted Desert Washes

The Reconfigured Alternative does not include a plan for rerouting desert washes; however, it is assumed that rerouting of washes would still be necessary. The Reconfigured Alternative Disturbance Area total acreage would be significantly greater if rerouted drainage channels were included in the design. There would likely be adjustments to the washes requiring rerouting. Additional washes may require rerouting due to the relocation of the southwest power block.

4.2 CONSTRUCTION IMPACTS

This section identifies impacts to the biological resources within the BSPP that would result from construction-related activities for the Proposed Project and Reconfigured Alternative. Sensitive vegetation communities and other land cover types were defined in Section 3.1 and sensitive species were defined in Sections 3.3 and 3.4. All jurisdictional waters, including unvegetated channels, are considered sensitive.

4.2.1 Vegetation Communities

Sensitive vegetation communities and other land cover types were defined in Section 3.1. All potential jurisdictional waters, including desert dry wash woodland and unvegetated ephemeral dry wash, are considered sensitive vegetation communities. In addition, creosote – big galleta association and desert dry wash woodland are special community types (e.g., high priority for inventory in the CNDDB) per the CDFG Vegetation and Mapping Program (CDFG 2003).

4.2.1.1 Direct Impacts

Table 17 identifies the vegetation communities and other cover types within both disturbance areas that would be directly and permanently impacted. Direct, permanent impacts to non-sensitive vegetation communities and cover types would not be considered significant. As mentioned above, desert dry wash woodland and unvegetated ephemeral dry wash are considered potential jurisdictional state waters and are, therefore, considered sensitive vegetation communities. Additionally, creosote – big galleta association is special community type per

CDFG and also considered sensitive. The permanent removal of these sensitive vegetation communities would be considered a significant impact (Table 17).

Table 17
Anticipated Permanent Direct Impacts to
Plant Communities and Waters of the State in the Project and
Reconfigured Alternative[1] Disturbance Areas (in acres)

Vegetation Communities and Other Cover Types	Project Permanent Direct Impacts	Reconfigured Alternative Permanent Direct Impacts
Riparian		
Creosote Bush – Big Galleta Association	370.82	237.04
Desert Dry Wash Woodland[2]	212.94	171.32
Unvegetated Ephemeral Dry Wash[2]	8.66	4.96
Subtotal Riparian	*592.42*	*413.32*
Upland		
Sonoran Creosote Bush Scrub	6,364.59	5,134.66
Stabilized and Partially Stabilized Desert Dunes	58.17	0
Subtotal Upland	*6,422.76*	*5,134.66*
Other		
Agricultural Land	4.44	0
Developed	4.90	0
Disturbed	0	0
Subtotal Other Cover Types	*9.34*	*0*
Total	**7,024.51**	**5,547.98**

[1] Reconfigured Alternative is not a complete engineering design; thus, these comparisons are not valid reflections of how a complete Reconfigured Alternative would compare to the Proposed Project (refer to Section 1.3).
[2] Potential Waters of the State

Proposed Project

Permanent direct impacts to both nonsensitive and sensitive vegetation communities within the Project Disturbance Area would occur as a result of construction-related activities. The permanent direct impacts would be a result of grading and installation of the solar facility, which would result in the permanent removal of vegetation within the Project Disturbance Area.

Reconfigured Alternative

Permanent direct impacts to both nonsensitive and sensitive vegetation communities within the Reconfigured Alternative Disturbance Area would occur as a result of construction-related activities. The permanent direct impacts would be a result of grading and installation of the solar facility, which would result in the permanent removal of vegetation within either disturbance area.

Creosote Bush – Big Galleta Association

The Proposed Project would permanently, directly impact more creosote bush – big galleta association than the Reconfigured Alternative (Table 17). Most of the creosote bush – big galleta association occurring within the Combined Survey Area overlaps with both the Project Disturbance Area and the Reconfigured Alternative Disturbance Area.

Desert Dry Wash Woodland

The Proposed Project would permanently, directly impact more desert dry wash woodland than the Reconfigured Alternative (Table 17). Some desert dry wash woodland occurs south of I-10 but most is localized in the northern and central portions of the Combined Survey Area where there is overlap with both the Proposed Project Study Area and the Reconfigured Alternative Disturbance Area.

The southward shift of solar block #4 (southwest) under the Reconfigured Alternative avoids a major wash containing dry desert wash woodland, but in turn impacts a different major wash containing this vegetation community (Figure 8).

Unvegetated Ephemeral Dry Wash

The Proposed Project would permanently, directly impact twice as much unvegetated ephemeral dry wash as the Reconfigured Alternative (Table 17). There are nearly equivalent amounts of unvegetated ephemeral dry wash mapped within the Proposed Project BRSA and Reconfigured Alternative BRSA, which is due to overlap between the two alternatives (Table 1). The southward shift of solar block #4 (southwest) under the Reconfigured Alternative avoids a major wash containing some unvegetated ephemeral dry wash, but in turn impacts a different major vegetated wash containing dry desert wash woodland (Figure 8).

Sonoran Creosote Bush Scrub

The Proposed Project would permanently, directly impact more Sonoran creosote bush scrub than the Reconfigured Alternative (Table 17). Most areas of Sonoran creosote bush scrub occurring within the Reconfigured Alternative BRSA overlap with the Proposed Project BRSA (Figure 8).

Stabilized and Partially Stabilized Desert Dunes

The Proposed Project would permanently, directly impact stabilized and partially stabilized desert dunes. The Reconfigured Alternative BRSA does not contain this vegetation community (Tables 3 and 17). However, this is because a transmission line corridor and substation have not been included within the Reconfigured Alternative Disturbance Area. It is likely that a transmission line designed for the Reconfigured Alternative would interconnect to the SCE grid at the Colorado River Substation (CRSS), and it is at the CRSS site and immediate vicinity where the vast majority of stabilized and partially stabilized dunes occur.

Agricultural Land, Developed Areas, and Disturbed Areas

Only the Proposed Project would permanently, directly impact agricultural land and developed areas (Table 17). Development of previously disturbed areas instead of native habitat is preferable.

4.2.1.2 Indirect Impacts

Indirect impacts are identical for both the Proposed Project and Reconfigured Alternative. Potential temporary and permanent, indirect impacts to the vegetation communities surrounding either disturbance area would occur as a result of construction-related activities. Grading activities that have potential to create airborne dust, sedimentation, and erosion, can lead to the eventual death of buried vegetation. The potential spread of exotic species into the surrounding vegetation communities would be considered a permanent, indirect impact. Exotic species are opportunistic and could occupy disturbed soils within the disturbance area and spread into adjacent vegetation communities. Additionally, wildfires (caused by construction or downed transmission lines) are rare but do occur and exotic species often frequent burned areas following a wildfire. Once introduced, these exotic species often outcompete natives for resources resulting in a reduction in growth, future dispersal, and recruitment of native species and the eventual degradation of the vegetation community. As described previously, existing desert washes within

the facility would be rerouted through and around the footprint. This can result in offsite vegetation receiving lower or higher volumes and rates of water than current conditions. This in turn may lead to the desiccation of some vegetation communities and edema (excess water) in other vegetation communities. In addition, higher flow rates may result in erosion and root exposure leading to the eventual death of vegetation. These impacts would be considered significant if left unmitigated where creosote bush – big galleta association, desert dry wash woodland, and unvegetated ephemeral dry wash are adjacent to the disturbance area.

4.2.1.3 Significance after Mitigation

Potential construction-related direct and indirect impacts to sensitive vegetation communities would be reduced to less than significant through implementation of the avoidance, minimization, and mitigation measures as noted in Chapter 5 (i.e., implementation of measures from the 2009 BRTR, as well as eventual CEC Conditions of Certification and requirements specified in the Biological Opinion and by BLM).

4.2.2 Jurisdictional Waters

4.2.2.1 Direct Impacts

As discussed in Chapter 3, the Project team has determined that the Project Disturbance Area and the Reconfigured Alternative Disturbance Area do not support jurisdictional waters of the United States. It is anticipated that USACE will not assert jurisdiction over any waters and/or aquatic features occurring within either disturbance area. Final acreages of jurisdictional waters of the United States will be based upon the Approved JD process, which is in progress.

Proposed Project

The Proposed Project would result in permanent direct impacts (inside the Project Disturbance Area) resulting from construction activities (including grading, staging, and where all Proposed Project components would be built and placed) to approximately 205.60 acres of waters of the State and 365.59 acres of vegetated swales – big galleta grass association. The proposed project would also result in permanent indirect impacts (outside or downstream of the Project Disturbance Area) to approximately 137.83 acres of waters of the State and 44.60 acres of vegetated swales – big galleta grass association. Project-specific potential impacts (both permanent direct and permanent indirect) toward each type of potential jurisdictional waters as a result of the Proposed Project are approximately 343.42 acres of state waters and 410.19 acres of

vegetated swales and are listed in Table 18 and 19. The permanent direct and indirect impact of these jurisdictional waters would be considered a significant impact if left unmitigated.

Table 18
Potential Impacts to Potential Jurisdictional Waters of the United States and State Occurring within the Project Disturbance Area[a]

Form of Jurisdictional Waters of the State	Regulatory Authority	Direct Impacts *Inside Project Disturbance Area*	Indirect Impacts *Hydrologically Connected Downstream*	Total Impact Area
Xeric Riparian Extent	CDFG, RWQCB	197.04	137.49	334.53
Unvegetated Washes	CDFG, RWQCB	8.56	0.33	8.89
Total		**205.60**	**137.83**	**343.42**

[a] Acreage of all jurisdictional waters was determined by utilizing the GIS program ArcGIS. All acreages are rounded to the nearest hundredth.

Table 19
Potential Impacts to Vegetated Swales within the Project Disturbance Area[a]

Hydrologic Feature	Regulatory Authority	Direct Impacts *Inside Project Disturbance Area*	Indirect Impacts *Hydrologically Connected Downstream*	Total Impact Area
Swale supporting Wash-Dependent Vegetation	CDFG, RWQCB	365.59	44.60	410.19

[a] Acreages were determined by utilizing the GIS program ArcGIS. All acreages are rounded to the nearest hundredth.

Reconfigured Alternative

The Reconfigured Alternative would result in permanent direct impacts (inside the Reconfigured Alternative Disturbance Area) resulting from construction activities (including grading and where all proposed solar blocks and related components[9] will be built and placed) to approximately 176.28 acres of waters of the State and 237.25 acres of vegetated swales – big galleta grass association. The Reconfigured Alternative would also result in permanent indirect impacts (outside or downstream of the Reconfigured Alternative Disturbance Area) to approximately 71.74 acres of waters of the State and 40.06 acres of vegetated swales – big galleta grass association. Specific potential impacts related to the Reconfigured Alternative (both permanent direct and permanent indirect) toward each type of potential jurisdictional waters are approximately 248.02 acres of waters of the State and 277.31 acres of vegetated swales and are

[9] The Reconfigured Alternative Disturbance Area encompasses the disturbance cause by construction of the solar power blocks and their associated solar fields only.

listed in Table 20 and 21. The Reconfigured Alternative is not a complete engineering design. Additional peripheral component would result in greater impacts to jurisdictional waters of the State and vegetated swales. For example, connecting the northern solar units to the southwestern solar unit in the Reconfigured Alternative would result in additional direct and indirect permanent impacts that are not reflected here.

Table 20
Potential Impacts to Potential Jurisdictional Waters of the United States and State Occurring within the Reconfigured Alternative Disturbance Area[a]

Form of Jurisdictional Waters of the State	Regulatory Authority	Direct Impacts *Inside Disturbance Area*	Indirect Impacts *Hydrologically Connected Downstream*	Total Impact Area
Xeric Riparian Extent	CDFG, RWQCB	171.32	71.15	242.47
Unvegetated Washes	CDFG, RWQCB	4.96	0.59	5.55
Total		**176.28**	**71.74**	**248.02**

[a] Acreage of all jurisdictional waters was determined by utilizing the GIS program ArcGIS. All acreages are rounded to the nearest hundredth.

Table 21
Potential Impacts to Vegetated Swales within the Reconfigured Alternative Disturbance Area[a]

Hydrologic Feature	Regulatory Authority	Direct Impacts *Inside Disturbance Area*	Indirect Impacts *Hydrologically Connected Downstream*	Total Impact Area
Swale supporting Wash-Dependent Vegetation	CDFG, RWQCB	237.25	40.06	**277.31**

[a] Acreages were determined by utilizing the GIS program ArcGIS. All acreages are rounded to the nearest hundredth.

4.2.2.2 Indirect Impacts

Indirect impacts are essentially identical for both the Proposed Project and Reconfigured Alternative. Potential temporary and permanent, indirect impacts to the jurisdictional waters surrounding the disturbance area would occur as a result of construction-related activities. Potential temporary, indirect impacts would occur as a result of grading activities creating airborne dust and potentially offsite erosion and sedimentation. The potential permanent, indirect impacts to the jurisdictional waters surrounding either disturbance area would result from the alteration of drainage patterns. As described previously, existing desert washes within the facility would be rerouted through and around the Project Disturbance Area or the Reconfigured Alternative Disturbance Area.

Although, the Post-Development Drainage Conditions Report (AECOM 2010c) documents that the peak flows and flow volumes are relatively unchanged in the pre-development condition compared with the post-development condition, there may be indirect impacts to downstream jurisdictional waters of the State as a result of slight variation in discharge points. The Post-Development Drainage Conditions Report provides full information for the post development drainage condition associated with the site for the 10 year, 25 year, and 100 year storm events. The existing drainage outlets from the site are natural swales or broad drainage fans, not private or public conveyance structures, and these natural swales and/or fans are hydraulically respected by the proposed design using drainage diffusers at the various drainage outlets from the site. The final design for these drainage features will incorporate all the requirements as noted by the Conditions of Certification. These impacts would be considered significant if left unmitigated where waters of the State are adjacent to the Project Disturbance Area or the Reconfigured Alternative Disturbance Area.

4.2.2.3 Significance after Mitigation

Potential construction-related direct and indirect impacts to jurisdictional waters of the State would be reduced to less than significant through Project plans to reroute washes around the site and implementation of the avoidance, minimization, and mitigation measures as noted in Chapter 5 (i.e., implementation of measures from the 2009 BRTR, as well as eventual CEC Conditions of Certification and requirements specified in the Biological Opinion and by BLM).

4.2.3 Flora

Federally and State-Listed Plant Species

Direct Impacts

No federally or State-listed plants were detected within the Combined Survey Area; therefore, no direct impacts to listed plant species would result from Project construction.

Indirect Impacts

No federally or State-listed plants were detected within the Combined Survey Area; therefore, no indirect impacts to listed plant species would result from Project construction.

Other Special Status Plant Species

Direct Impacts

Proposed Project

Permanent direct impacts to six of the seven non-listed special status species documented within the Project Disturbance Area would occur as a result of construction activities (Table 22). These special status plant species are expected to be permanently and directly impacted through removal during Project construction. Impacts to these species in the form of permanent removal would be considered a significant impact if left unmitigated. Additionally, a large number of Harwood's milkvetch, ribbed cryptantha and Harwood's woollystar occurrences within the Project Disturbance Area are associated with the transmission line.

Table 22
Direct Impacts to Special Status Plant Species Documented within the Proposed Project BRSA and Reconfigured Alternative BRSA

Species Common Name	**Project Disturbance Area Permanent Direct Impacts** ***(number of occurrences [plant count])***	**Reconfigured Alternative Disturbance Area Permanent Direct Impacts** ***(number of occurrences [plant count])***
CNPS List 1B and CNPS List 2 Plant Species		
Harwood's milkvetch	74 (637)	69 (290)
Las Animas colubrine	15 (55)	12 (49)
Harwood's woollystar	3 (13)	0 (0)
CNPS List 4 Plant Species		
ribbed cryptantha[1]	10 ($1.5x10^6$) 58.17 acres	0 (0) 0 acres
winged cryptantha	0 (0)	0 (0)
Utah milkvine[2]	192 (621)	188 (677)
desert unicorn	8 (9)	11 (21)

[1] Ribbed cryptantha is also expressed in terms of area (acres) due to the high abundance of this species in the substation area. Plant counts are estimates, based on subsampling data from within the ribbed cryptantha population (calculated density of 6.2 plants per square meter, or 25,091 plants per acre).

[2] This species uses shrubs for support and tends to form many twining branches that are highly variable in number. Individual plants growing at the base of the same shrub may cause an undercount; therefore, these numbers are approximate.

Reconfigured Alternative

Permanent direct impacts to four of the five non-listed special status species documented within the Reconfigured Alternative Disturbance Area would occur as a result of construction activities. The special status plant species shown in Table 22 are expected to be permanently and directly impacted through removal during Project construction. Impacts to these species in the form of permanent removal would be considered a significant impact if left unmitigated. The Reconfigured Alternative is anticipated to connect to the same offsite CRSS substation and would therefore likely result in similar impacts as the Proposed Project. Furthermore, the Reconfigured Alternative would slightly increase direct impacts to desert unicorn.

Harwood's Milkvetch

Impacts to Harwood's milkvetch are shown in Table 22. This species occurs throughout the eastern half of the Proposed Project BRSA and in the transmission line south of I-10. Most Harwood's milkvetch occurrences within the Reconfigured Alternative BRSA overlap with the Proposed Project BRSA. The additional Harwood's milkvetch occurrences within the Proposed Project BRSA are attributable to the transmission line and substation. The Reconfigured Alternative is anticipated to connect to the same offsite CRSS substation and would therefore likely result in similar impacts as the Proposed Project.

Because Harwood's milkvetch is an annual herb and the high desert winds can disperse the inflated seed pods and large seeds over distances larger than the Combined Survey Area, it can be assumed that all sandy areas within the Combined Survey Area may support Harwood's milkvetch in dynamic distributions from year to year.

Las Animas Colubrina

Impacts to Las Animas colubrine are shown in Table 22. Because Las Animas colubrina is a perennial shrub that is confined to incised washes within the northwestern portion of the Combined Survey Area, and no additional Las Animas colubrina was detected in 2010, it can be assumed that the distribution of this species does not change greatly from year to year.

Ribbed Cryptantha

Survey results of ribbed cryptantha are shown in Table 9 and impacts are shown in Table 22. This species is found mostly around the substation area and transmission line corridor. The

Reconfigured Alternative is anticipated to connect to the same offsite CRSS substation and would therefore likely result in similar impacts as the Proposed Project.

Because ribbed cryptantha is an annual herb that is confined to loose sand dunes in the substation portion of the Combined Survey Area, it can be assumed that the abundance and distribution of this species may fluctuate within the dunes from year to year but the species likely does not disperse beyond the dune habitat.

Winged Cryptantha

Survey results of winged cryptantha are found in Tables 9 and 10. However, this species was only observed within buffer portions of the Combined Survey Area. Neither the Proposed Project nor the Reconfigured Alternative would permanently, directly impact this plant species.

Because winged cryptantha is an annual herb that occupies two distinct habitats within the Combined Survey Area, it can be assumed that the abundance and distribution of this species may fluctuate greatly from year to year.

Utah Milkvine

The Proposed Project BRSA and Reconfigured Alternative BRSA contain nearly equivalent amounts of Utah milkvine (Tables 9 and 10).

Because Utah milkvine is a perennial vine that was observed in high numbers in both 2009 and 2010, it can be assumed that the distribution of this species may not change drastically from year to year but the ability to distinguish this species from the other vines may fluctuate based on environmental conditions (i.e., in years of low rainfall this species may lie dormant).

Harwood's Woollystar

The Proposed Project may permanently, directly impact Harwood's woollystar (Tables 9 and 22) The Reconfigured Alternative is anticipated to connect to the same offsite CRSS substation and would therefore likely result in similar impacts as the Proposed Project.

Because Harwood's woollystar is an annual herb that is confined to loose sand dunes in the substation portion of the Combined Survey Area, it can be assumed that the abundance and

distribution of this species may fluctuate within the dunes from year to year but the species likely does not disperse beyond the dune habitat.

Desert Unicorn

Survey results for the desert unicorn are depicted in Tables 9 and 10. The southward shift of solar block #4 (southwest) under the Reconfigured Alternative results in more desert unicorn occurring within the Reconfigured Alternative Disturbance Area than the Proposed Project Study Area. Direct impacts resulting from the Reconfigured Alternative are shown in Table 22.

Because desert unicorn is a perennial herb that occupies sandy washes throughout the Combined Survey Area, it can be assumed that the abundance and distribution of this species may fluctuate gradually year to year and could potentially include areas throughout the braided washes traversing the Combined Survey Area.

Indirect Impacts

Indirect impacts are essentially identical for both the Proposed Project and Reconfigured Alternative. There is the potential for both temporary and permanent indirect impacts to non-listed special status plant species occurring in the area surrounding the disturbance area as a result of Project-related construction activities, if left unmitigated. Seven special status plant species occur in the buffer areas associated with the Proposed Project BRSA and Reconfigured Alternative BRSA (Figures 10 and 11).

Potential temporary, indirect impacts to non-listed special status plant species would arise from unmitigated runoff and sedimentation, erosion, fugitive dust, and unauthorized access outside of the disturbance area by construction workers. Runoff, sedimentation, and erosion can adversely impact plant populations by damaging individuals or by altering site conditions sufficiently to favor other species (native and exotic nonnatives) that would competitively displace the special status species. Construction-generated fugitive dust can adversely affect plants by reducing the rates of metabolic processes such as photosynthesis and respiration. Potential permanent, indirect impacts to non-listed special status plant species are also likely to arise from population fragmentation and introduction of nonnative exotic species. Due to low densities in rare plant populations, they are susceptible to and are likely to become easily fragmented by the placement of Project facilities, which can impact pollinator activity and, as a result, gene flow. In addition, the introduction and establishment of exotic species within, or adjacent to, special status plant populations can adversely affect native species by reducing growth in addition to dispersal and

recruitment. Exotic species are opportunistic and often occupy disturbed soils such as those created in transmission line corridors and areas of exposed bare ground resulting from ground disturbing activities within the disturbance area. Wildfires caused by construction or downed transmission lines are rare but may occur. Exotics often frequent areas adjacent to and within burn areas following a wildfire. These potential permanent indirect impacts would be considered a significant impact if left unmitigated.

Significance after Mitigation

Potential construction-related direct and indirect impacts to the seven non-listed special status plant species occurring within the BRSA would be reduced to less than significant through implementation of the avoidance, minimization, and mitigation measures as noted in Chapter 5 (i.e., implementation of measures from the 2009 BRTR, as well as eventual CEC Conditions of Certification and requirements specified in the Biological Opinion and by BLM).

4.2.4 Wildlife Species

Federal Listed Wildlife Species – Desert Tortoise

Direct Impacts

Proposed Project

Direct impacts would occur to suitable DT habitat as a result of construction grading and vegetation removal in the Project Disturbance Area. A single adult male DT that was observed on the west side of the disturbance area would be directly impacted. No active burrow was noted to be associated with this DT during this observation; however, there are five active burrows and three active pallets within the western portion of the Project Disturbance Area. These DT burrows and foraging habitat for the single male DT would be directly impacted by construction activities.

Direct permanent impacts to 7,014.8 acres of DT habitat would potentially occur as a result of construction of Project facilities. Approximately 3,990.1 acres of this acreage is moderate-quality DT habitat and 3,024.7 acres is low-quality DT habitat (Figure 14). Temporary direct impacts to the DT would result from an increase in vehicle traffic during development of the disturbance area prior to the establishment of the DT exclusionary fencing. Since DT is a federally listed species, any removal of active burrows and occupied foraging habitat would be considered

significant if left unmitigated. To limit direct mortality to individual DT, the Project Disturbance Area would be fenced and preconstruction DT clearance would occur.

Reconfigured Alternative

Direct impacts would occur to suitable DT habitat as a result of construction grading and vegetation removal in the Reconfigured Alternative Disturbance Area. Two adult male DTs were observed in the southwest power block. No active burrow was noted to be associated with the DT on the north side of the southwest power block; however, the DT found on the southern side was seen at the entrance to a DT burrow. Additionally, there are seven active burrows and three active pallets within the Reconfigured Disturbance Area. These DT burrows and foraging habitat for the two male DTs would be directly impacted by construction activities.

Direct permanent impacts to 5,548.0 acres of DT habitat would potentially occur as a result of construction of Project facilities. Approximately 3,017.1 acres of this acreage is moderate-quality DT habitat (for this area) and 2,530.9 acres is low-quality DT habitat (Figure 15). Temporary direct impacts to the DT would result from an increase in vehicle traffic during development of the disturbance area prior to the establishment of the DT exclusionary fencing. Since DT is a federally listed species, any removal of active burrows and occupied foraging habitat would be considered significant if left unmitigated. To limit direct mortality to individual DT, the Reconfigured Alternative Disturbance Area would be fenced and preconstruction DT clearance would occur.

Indirect Impacts

Indirect impacts are essentially identical for both the Proposed Project and Reconfigured Alternative. Indirect impacts to DT would occur from increased common raven (*Corvus corax*) presence associated with the construction of new elevated perching sites (e.g., new transmission line towers, perimeter fencing). Development and new elevated perching sites as a result of Project construction could increase the probability that young ravens remain in the area and could increase raven numbers which, in turn, could result in increased predation on DT in the vicinity of each disturbance area.

Indirect impacts would also result from invasive plants that outcompete native plants and reduce foraging habitat for DT. Potential deposition of sediment loads during heavy rain events and flooding downstream of the site, which would impact existing DT burrows outside of the survey

area. Additionally, increased road used to the construction site may increase the potential of vehicles crushing DT.

Significance after Mitigation

Since DT is a federally listed species, any adverse impact would be considered significant if left unmitigated. Potential construction-related direct and indirect impacts to DT would be reduced to less than significant through implementation of the avoidance, minimization, and mitigation measures as noted in Chapter 5 (i.e., implementation of measures from the 2009 BRTR, as well as eventual CEC Conditions of Certification and requirements specified in the Biological Opinion and by BLM).

State Listed Wildlife Species - Desert Tortoise

See the discussion above regarding impacts to the federally listed and State-listed DT. The DT is the only State-listed species known on site.

Other Special Status Wildlife Species

Direct Impacts

Direct impacts to other non-listed, special status wildlife species would result from the construction of facilities and development of each the disturbance area regardless of the selected alternative. Construction would result in the crushing of occupied burrows and destruction of nests, collisions with construction and maintenance vehicles, and loss of habitat. Direct impacts specific to non-listed special status wildlife species are discussed below.

Indirect Impacts

Indirect impacts from potential deposition of sediment loads during heavy rain events and flooding downstream of the site could impact existing habitat for non-listed special status wildlife outside of the Project site. However, these impacts would be minimized by Project design (i.e., rerouting the desert wash and connecting to offsite channels, and grading and compacting the entire footprint of the solar array, thereby reducing onsite erosion). Similarly, indirect impacts to habitat by changes in drainage patterns potentially altering offsite vegetation communities would be minimized by design.

Temporary, indirect impacts are likely to arise from construction-generated fugitive dust accumulation on surrounding vegetation resulting in destruction and/or avoidance of habitat by wildlife. Nighttime lighting during the construction phase would also disrupt species movement and/or cause increased predation rates. Indirect impacts from potential deposition of sediment loads during heavy rain events and flooding downstream of the site would impact existing habitat for non-listed special status wildlife outside of the survey area.

However, these impacts would be minimized by design (i.e., rerouting the desert wash and connecting to an offsite channel, and grading and compacting the entire footprint of the solar array, thereby reducing onsite erosion). Similarly, indirect impacts to habitat by changes in drainage patterns potentially altering offsite vegetation communities would be minimized by design.

The potential for Project-related direct and indirect impacts specific to non-listed special status wildlife species is discussed in the following text.

Western Burrowing Owl

Direct Impacts

Proposed Project

Based on 2009 and 2010 data, construction grading and vegetation removal in the Proposed Project Disturbance Area would permanently impact WBO by removing one active WBO burrow and habitat for one individual WBO. No WBO breeding in 2009 was documented during surveys. No additional WBO presence within the Proposed Project Disturbance Area was documented incidental to the 2010 surveys. Most of the Project Disturbance Area contains suitable WBO habitat, with the exception of the far western portion. The far western portion is characterized by steep, rocky canyons; desert wash; and hard desert pavement and cobble terrace substrate, and contains few burrows suitable for nesting WBOs. Most burrows with WBO sign had relatively small amounts of degraded sign, indicating that owls only used them for a brief period of time before vacating, or previous use may have been more extended or regular but much of the original sign has disappeared. It is possible that the Proposed Project BRSA may be used more during migration or other seasonal movements, or during winter. Temporary direct impacts to WBO would also result from an increase in vehicle traffic while the Project is under construction and, consequently, an increase in vehicular strikes of WBOs.

Reconfigured Alternative

Based on spring 2010 data, construction grading and vegetation removal in the Reconfigured Alternative Disturbance Area would permanently impact WBO by removing habitat for one individual WBO. No WBO breeding in 2010 was documented during surveys. Site conditions and potential impacts to the Reconfigured Alternative Disturbance Area are identical to those detailed for the Proposed Project above.

The loss of occupied WBO breeding or wintering habitat is considered a significant impact if left unmitigated. Specifically, based on the CBOC mitigation guidelines and definition of impacts, the following potential effects on WBO as a result of Project implementation would be significant and require mitigation: 1) disturbance or harassment of WBOs within 160 feet of occupied burrows; 2) destruction of active burrows and burrow entrances; and 3) degradation of foraging habitat adjacent to occupied burrows.

Indirect Impacts

Indirect impacts of Project construction on WBO are discussed in general above (see Other Special Status Wildlife Species). Indirect impacts are identical for both the Proposed Project and Reconfigured Alternative. Indirect impacts could result from increased common raven and raptor predation on WBO associated with the addition of new elevated perching sites, including the transmission structures, perimeter fencing, and transmission lines, as discussed previously for DT. Additionally, temporarily ponded water from construction (e.g., dust suppression during construction) and garbage from increase human presence might attract common ravens. These indirect impacts would potentially impact WBO and offsite WBO breeding habitat or burrows and adjacent foraging habitat. These indirect impacts would be considered significant.

Significance after Mitigation

Potential construction-related direct and indirect impacts to WBO would be reduced to less than significant through implementation of the avoidance, minimization, and mitigation measures as noted in Chapter 5 (i.e., implementation of measures from the 2009 BRTR, as well as eventual CEC Conditions of Certification and requirements specified in the Biological Opinion and by BLM).

Loggerhead Shrike

Direct Impacts

Proposed Project

Suitable loggerhead shrike habitat present throughout the footprint would be directly impacted by construction of the Project Disturbance Area.

Reconfigured Alternative

Suitable loggerhead shrike habitat present throughout the footprint would be directly impacted by construction of the Reconfigured Alternative Disturbance Area.

The species was found at low densities in both the Proposed Project and Reconfigured Alternative Disturbance Areas, predominately in the Sonoran creosote bush scrub, and in transitional areas composed of both Sonoran creosote bush scrub and desert dry wash woodland. Impacts would be similar for both the Proposed Project and Reconfigured Alternative.

The loss of occupied breeding habitat is considered to be a significant impact if left unmitigated, since this habitat is declining in availability in the region.

Indirect Impacts

Indirect impacts are identical for both the Proposed Project and Reconfigured Alternative. Indirect impacts of Project construction on loggerhead shrike are discussed above (see discussion under Other Special Status Wildlife Species). These indirect impacts would potentially impact offsite loggerhead shrike breeding habitat or burrows and adjacent foraging habitat. These indirect impacts would be considered significant if left unmitigated.

Significance after Mitigation

The potential loss of occupied breeding habitat is considered significant; however, this impact would be reduced to less than significant through implementation of the avoidance, minimization, and mitigation measures as noted in Chapter 5 (i.e., implementation of measures from the 2009 BRTR, as well as eventual CEC Conditions of Certification and requirements specified in the Biological Opinion and by BLM).

American Badger

Direct Impacts

Proposed Project

Direct permanent impacts would occur to 7,020 acres of occupied American badger habitat as a result of construction of the Project Disturbance Area. Fourteen American badger dens would be impacted by Project facilities. American badger predation and den activity occur predominately in the western portion of the disturbance area; however, the entire disturbance area has suitable foraging and dispersal habitat for this species.

Temporary direct impacts to American badger would also result from an increase in vehicle traffic while the Project is under construction and, consequently, an increased potential for vehicular strikes of this species.

Reconfigured Alternative

Direct permanent impacts would occur to 5,548 acres of occupied American badger habitat as a result of construction of the Reconfigured Alternative Disturbance Area. Seventeen American badger dens would be impacted by Project facilities. American badger predation and den activity occurs predominately on the western portion of the disturbance area; however, the entire disturbance area has suitable foraging and dispersal habitat for this species.

Temporary direct impacts to American badger would also result from an increase in vehicle traffic while the Project is under construction and, consequently, an increased potential for vehicular strikes of this species.

The permanent loss of occupied American badger burrows and adjacent foraging habitat is considered a significant impact if left unmitigated, since, regionally, this habitat is limited in availability.

Indirect Impacts

Indirect impacts are identical for both the Proposed Project and Reconfigured Alternative. Indirect impacts of Project construction on American badger are discussed above (see discussion under Other Special Status Wildlife Species). These indirect impacts would potentially impact

offsite American badger breeding habitat or burrows and adjacent foraging habitat. These indirect impacts would be considered significant if left unmitigated.

Significance after Mitigation

Potential construction-related direct and indirect impacts to American badger would be reduced to less than significant through implementation of the avoidance, minimization, and mitigation measures as noted in Chapter 5 (i.e., implementation of measures from the 2009 BRTR, as well as eventual CEC Conditions of Certification and requirements specified in the Biological Opinion and by BLM).

Desert Kit Fox

Direct Impacts

Proposed Project

Direct permanent impacts would occur to 7,020 acres of occupied desert kit fox habitat as a result of construction of the Project Disturbance Area. Desert kit foxes are one of the three main mammalian predators observed, and signs of predation by this species is evident on small mammal (burrows) throughout the BRSA. Similarly, desert kit fox burrows and complexes are distributed throughout the entire disturbance area and were noted within the buffer areas. A total of 158 desert kit fox burrows and 23 burrow complexes were recorded within the disturbance area.

Temporary direct impacts to desert kit fox would result from an increase in vehicle traffic while the Project is under construction and, consequently, an increased potential for vehicular strikes of this species.

Reconfigured Alternative

Direct permanent impacts would occur to 5,548 acres of occupied desert kit fox habitat as a result of construction of the Reconfigured Alternative Disturbance Area. Desert kit foxes are one of the three main mammalian predators observed, and signs of predation by this species is evident on small mammal (burrows) throughout the BRSA. Similarly, desert kit fox burrows and complexes are distributed throughout the entire disturbance area and were noted within the

buffer areas. A total of 85 desert kit fox burrows and 24 burrow complexes were recorded within the disturbance area.

Temporary direct impacts to desert kit fox would result from an increase in vehicle traffic while the Project is under construction and, consequently, an increased potential for vehicular strikes of this species.

The permanent loss of occupied desert kit fox burrows and adjacent foraging habitat is considered a significant impact if left unmitigated, since regional habitat is limited in availability.

Indirect Impacts

Indirect impacts are identical for both the Proposed Project and Reconfigured Alternative. Indirect impacts of Project construction on desert kit fox are discussed above (see discussion under Other Special Status Wildlife Species). These indirect impacts would potentially impact offsite desert kit fox breeding habitat or burrows and adjacent foraging habitat. These indirect impacts would be considered significant if left unmitigated.

Significance after Mitigation

Potential construction-related direct and indirect impacts to desert kit fox would be reduced to less than significant through implementation of the avoidance, minimization, and mitigation measures as noted in Chapter 5 (i.e., implementation of measures from the 2009 BRTR, as well as eventual CEC Conditions of Certification and requirements specified in the Biological Opinion and by BLM).

Mojave Fringe-toed Lizard

Direct Impacts

Proposed Project

Direct impacts would occur to approximately 65 acres of sand dune habitat occupied by the MFTL in the transmission corridor (Figure 20). There were eight incidental MFTL observations recorded in this area of the Project Disturbance Area. Temporary direct impacts to MFTL would

result from an increase in vehicle traffic while the Project is under construction and, consequently, an increase in vehicular strikes of species.

Reconfigured Alternative

The Reconfigured Alternative is not a complete engineering design and thus potential MFTL impacts cannot be fully assessed. It is likely that development of a transmission corridor would be similar to the Proposed Project and it would be expected that the same SCE substation site would be the interconnection point for either the Proposed Project or the Reconfigured Alternative; thus similar direct impacts would be expected as a result of transmission line development in both instances.

The loss of occupied MFTL breeding and foraging habitat is considered to be a significant impact if left unmitigated since this habitat is declining in availability in the region.

Indirect Impacts

Indirect impacts of Project construction on MFTL are discussed above (see discussion under Other Special Status Wildlife Species). All MFTL habitat is located in the transmission corridor and this area would require installation of minimal or no wind fencing or substantive ground level structural barriers, so there would be little to no disruption of source sand, wind transport, or sand transport corridors that are important to MFTL habitat in the dune ecosystem. These indirect impacts would potentially impact offsite MFTL breeding habitat and adjacent foraging habitat. These indirect impacts would be considered significant if left unmitigated.

Significance after Mitigation

Potential construction-related direct and indirect impacts to MFTL would be reduced to less than significant through implementation of the avoidance, minimization, and mitigation measures as noted in Chapter 5 (i.e., implementation of measures from the 2009 BRTR, as well as eventual CEC Conditions of Certification and requirements specified in the Biological Opinion and by BLM).

Migratory Birds

Direct Impacts

The Proposed Project and Reconfigured Alternative would result in direct construction-related impacts to bird populations onsite in the form of habitat destruction, and potentially death, injury, or harassment of nesting birds, their eggs and their young. “Take” under the MBTA is generally interpreted as the direct death or injury of birds from collisions with vehicles and other machinery. This most frequently occurs during the vegetation clearing stage of construction and involves eggs, nestlings, and recently fledged young that cannot safely avoid equipment. Other direct impacts on bird populations using the site are the same as those identified above for listed and nonlisted special status species. Direct construction related impacts to migratory birds would be considered significant if left unmitigated.

Indirect Impacts

Indirect impacts are identical for both the Proposed Project and Reconfigured Alternative. Indirect impacts on migratory birds would include increased common raven and raptor predation associated with the addition of new subsidies including elevated perching sites, such as the tower structures, the transmission lines, perimeter fencing and support structures, food sources (e.g., waste), and water from evaporation ponds that are likely to attract common ravens, as discussed previously for DT. Temporary, indirect impacts are likely to arise from construction-generated fugitive dust accumulation on surrounding vegetation and construction-related erosion, runoff, and sedimentation into plant communities resulting in destruction and/or avoidance of migratory bird habitat.

Additionally, construction-related noise has potential to cause migratory bird nest abandonment in areas adjacent to construction in each disturbance area. Indirect impacts from these construction-related activities would be temporary, as these impacts would end with cessation of Project construction.

These indirect impacts would potentially impact breeding habitat and would be considered significant if left unmitigated.

Significance after Mitigation

Potential construction-related direct and indirect impacts to migratory birds would be reduced to less than significant through implementation of the avoidance, minimization, and mitigation measures as noted in Chapter 5 (i.e., implementation of measures from the 2009 BRTR, as well as eventual CEC Conditions of Certification and requirements specified in the Biological Opinion and by BLM).

4.2.5 Wildlife Movement

Direct Impacts

Proposed Project

The BSPP would result in direct impacts to local wildlife movement. These impacts would result from construction of the perimeter fence that would surround the facility footprint. The design of the five proposed rerouted channels may impede wildlife movement. The amount of vegetative cover that will be present as a result of natural recruitment and channel maintenance activities will be too little to provide wildlife with the security to frequently use the channel for local movement. The longest rerouted channel will run across the site from west to east and will be approximately 3.6 miles long. The other rerouted channel will run across the site from west to east and will be approximately 2.8 miles long; however, this channel does have a junction at another channel headed south near the middle of the channel. These lengths make it highly unlikely that wildlife will attempt to travel this distance with no vegetation cover. Although the shorter channel has an alternate route to shorten the distance, wildlife will not be able to see or know that an alternate route exists and are unlikely to use it. Additionally, although the channel width will be 150 feet wide, the visibility of man-made structures could cause behavioral avoidance of the channel and there would be insufficient vegetation cover to shield these man-made structures from wildlife's view.

Although impacts on local wildlife movement are anticipated, these impacts would generally be less than significant for common species. The facility footprint is not located within documented important migration routes for any terrestrial wildlife species, and most of the animals expected to move across the BSPP are considered common in California. Local movement and habitat continuity may be impeded by implementation of the BSPP. However, much of the land surrounding the site is expected to remain as natural desert plant communities, which would allow movement by common terrestrial wildlife species to continue outside of the perimeter of

the site without significant impediment. For these reasons, impacts on common terrestrial wildlife species would be less than significant.

Without mitigation, the Project may adversely affect local movement and dispersal for DT. Although DT is not a migratory species, opportunities for local movements within their home ranges and juvenile dispersal are important for maintaining viable populations. These effects would result from construction of the perimeter security fence and DT exclusion fence that would surround the Project facilities. The fence would create a permanent barrier and generally prevent local movement across the site by DT. While rerouted channels would have remained accessible to DT from adjacent areas (channels would either be constructed outside the facilities perimeter fence or DT would not be completely excluded by the chain-link fence), these channels are not expected to retain suitable habitat features for DT, and in the case of the channels passing through the Project site, could create a movement trap for DT. The lack of suitable vegetative cover for DT and increased human presence on site would limit DT from inhabiting or using rerouted channels for successful movement or dispersal through the middle of the Project site over the course of several generations. However, this would likely impact only one DT generation (which is approximately 15 to 20 years) because the life of the project is estimated to be approximately 30 years.

To prevent DT from potentially being trapped and/or lost in the central channels, a permanent DT-proof fence, or similar structure sufficient to exclude DTs from rerouted channels passing through the Project site, would be installed around the perimeter of the Project to keep DT from entering.

The project may affect DT in the context of local population dispersal because it is a resident species that generally only moves within its home range, with the exception of juvenile dispersal. Areas suitable for DT, but that are low density or occasionally not occupied, can be important for local DT movement, as this species is likely distributed in metapopulations (Tracy et al. 2004). Metapopulations are groups within a population that are typically confined to specific regions as a result of resource availability. If a metapopulation becomes fragmented, it may no longer be sustainable because individuals are not exchanged between metapopulations. The mountains on the western side of the action area within the buffer and just outside the buffer probably have significantly more DTs present than observed within the Project Disturbance Area (e.g., two DTs were observed during Project surveys in this portion of the buffer). DTs are likely present more frequently in the montane areas within this region due to the Sonoran climatic influence. The development of intervening valleys could preclude the natural dispersal of DTs between these montane populations. Local wildlife movement would be reduced because the large Project

Disturbance Area would contribute to fragmentation of the surrounding large and contiguous desert landscape. DT home ranges are small (25 to 200 acres) relative to the 7,025-acre Project Disturbance Area, and Project construction there may increase the number of DT generations it takes for individuals to disperse (i.e., reduce rates of dispersal) across the valley floor between areas of higher quality habitat to the west and northeast of the action area. DTs are known to use low-quality intermountain habitat as dispersal routes over time, providing passage between high-quality habitat areas in the surrounding mountains (Averill-Murray and Averill-Murray 2005). Historically, tortoise populations in the Sonoran Desert have exchanged individuals at a rate of one migrant per generation (Averill-Murray and Averill-Murray 2005).

Other special status terrestrial wildlife species detected in the BSPP include MFTL, desert kit fox, and American badger. Other species, such as Nelson's bighorn sheep have potential to occur in the BSPP, but were not detected during surveys. MFTL habitat only occurs within the transmission corridor and no fences will be installed in this area, which will allow local movement to be maintained for this species. Wildlife will be able to cross the channels outside the fenceline and over time wildlife with larger home ranges may become habituated to the presence of the solar facility and may use the channels in the cover of darkness. Examples of species that may eventually use the channels include the mule deer, mountain lion (*Puma concolor*), coyote, desert kit fox, and American badger. Mule deer have been documented to have large dispersal distances (60.3 to 134.8 miles) with males exhibiting variable but typically greater distances than females (Robinette 1966). Mountain lions have the ability to move large distance with home ranges in California document from 25 square miles to 235 square miles (Grigione et al. 2002). Coyotes have been documented to have large dispersal distances up to 100 miles (Beckoff 1977) although more conservative estimates range from three miles (Hawthorne 1971) and 30 miles (Berg and Chesness 1978) depending on the locality and method of estimation. Kit fox home range size varies from 1 to 8 square miles (MacDonald and Sillero-Zubiri 2004). American badgers also have large home ranges and in California mean home range across all seasons for females (n=5) was estimated at 1.94 km^2 (480 acres) while mean home range across all seasons for males (n=4) was estimated at 11.23 km^2 (2,775 acres) (Quinn 2008). Although these species have the capability to move through the channels, the occurrences will likely be rare due to the lack of vegetation over such a great distance.

Although movement across the Project Disturbance Area north of I-10 would be limited to the rerouted channels, there is habitat outside of the disturbance area that would facilitate movement around the site for other species. Local wildlife movement would be reduced because the large facility footprint would contribute to fragmentation of a large and contiguous desert landscape. However, this impediment is not expected to adversely impact movement and/or population

dispersal by the species discussed above because similar desert habitat outside of the perimeter fence would likely provide adequate movement opportunities for foraging and dispersal.

Reconfigured Alternative

The Reconfigured Alternative is not a complete engineering design and wildlife movement impacts cannot be fully assessed. However, site conditions and potential impacts to the Reconfigured Alternative Disturbance Area are similar to those detailed for the Proposed Project above. The Reconfigured Alternative does provide a large area of open space between the power blocks, which could reduce the distance that wildlife would have to travel across the site. However, this could result in an attractive nuisance by funneling wildlife between two developed areas that likely will be connected via a road and other facilities. In addition, it is likely that the connecting road and facilities could serve as a deterrent to some wildlife. The configuration shortens the distance and increases the passage to the southeast; however, the area to the southeast is somewhat of a dead end in that it is composed of agricultural areas and the Blythe Airport. It also must be noted that a complete solar facility design would utilize additional acreage for the ancillary facilities that are not defined in the Reconfigured Alternative and, use of this additional acreage could well have additional (but currently unpredictable) impacts on local wildlife movement.

Indirect Impacts

Indirect impacts would be very similar between both the Proposed Project and Reconfigured Alternative. In both cases, the BSPP would potentially result in permanent indirect impacts to wildlife movement. Potential indirect impacts of the BSPP and associated edge effects include but are not limited to altered behavior due to environmental stressors, changes in daily activity patterns, reductions in population reproductive capacity, and local population extinctions due to compromised population genetics over time or an inability to re-colonize isolated patches of habitat. These impacts vary depending on the population structure, size of the home range, migrations, and dispersal movements of the species being considered, as well as the species' behavioral response to artificial light, noise, degraded surrounding habitat, and other anthropogenic influences.

Construction of the BSPP would have permanent indirect effects on wildlife movement. Wildlife movement would be altered due to edge effects associated with development. Individually, species respond behaviorally to the edge itself (the "ecotonal effect") or to the indirect habitat changes associated with edges (the "matrix effect") (Lidicker and Peterson 1999, Kristan et al.

2003). Behavioral avoidance of human-made structures and associated edges can decrease wildlife movement and deter passage. In addition, the BSPP would indirectly impact wildlife movement through species avoidance in response to human presence. All of these factors have the potential contribute to local species extinctions.

Significance after Mitigation

Potential construction-related direct and indirect impacts to wildlife movement and dispersal would be reduced to less than significant for DT through implementation of the avoidance, minimization, and mitigation measures as noted in Chapter 5 (i.e., implementation of measures from the 2009 BRTR, as well as eventual CEC Conditions of Certification and requirements specified in the Biological Opinion and by BLM).

4.3 OPERATION

Direct and indirect impacts on biological resources during the operation of the Proposed Project and Reconfigured Alternative are discussed below. Operation impacts are not substantially different for both the Proposed Project and Reconfigured Alternative as operational impacts are predominantly indirect impacts on the resources or localized direct impacts within the operational areas. Thus, the discussion below is not separated out by the Proposed Project and Reconfigured Alternative.

4.3.1 Vegetation Communities

Direct Impacts

No vegetation will occur within the disturbance area following construction. Therefore, operation of the BSPP would not result in temporary or permanent direct impacts to either non-sensitive or sensitive vegetation communities.

Indirect Impacts

Operation of the BSPP may result in permanent indirect impacts to non-sensitive and sensitive vegetation communities surrounding the disturbance area. Permanent, indirect impacts to sensitive vegetation communities may include edge effects and increased exposure to exotic plants. Erosion and stormwater contaminant runoff may degrade adjacent sensitive vegetation communities. Exotic plant species are opportunistic and often occupy disturbed soils such as

those within the transmission line corridors and areas of exposed bare ground that may occur within the disturbance area. Wildfires caused by downed transmission lines are rare but may occur. Exotics often frequent areas adjacent to and within burn areas following a wildfire. Once introduced, these exotic plant species often outcompete natives for resources resulting in a reduction in growth, future dispersal, and recruitment of native species and the eventual degradation of the vegetation community. The impacts from exotic plant species would be considered significant where desert dry wash woodland and unvegetated ephemeral dry wash occurs adjacent to the disturbance area.

Significance after Mitigation

Potential operation-related indirect impacts to sensitive vegetation communities would be reduced to less than significant through implementation of the avoidance, minimization, and mitigation measures as noted in Chapter 5 (i.e., implementation of measures from the 2009 BRTR, as well as eventual CEC Conditions of Certification and requirements specified in the Biological Opinion and by BLM).

4.3.2 Jurisdictional Waters

Direct Impacts

Operation of the BSPP would not result in temporary or permanent, direct impacts to jurisdictional waters, as they will not occur within the disturbance area following construction.

Indirect Impacts

Indirect impacts are identical for both the Proposed Project and Reconfigured Alternative. Operation may result in permanent indirect impacts to jurisdictional waters of the State. Erosion and stormwater contaminant runoff may degrade adjacent jurisdictional waters of the State. These impacts would be considered significant where waters of the State occur adjacent to the disturbance area, if left unmitigated.

Significance after Mitigation

Potential operation-related indirect impacts to jurisdictional waters of the state would be reduced to less than significant through implementation of the avoidance, minimization, and mitigation measures as noted in Chapter 5 (i.e., implementation of measures from the 2009 BRTR, as well

as eventual CEC Conditions of Certification and requirements specified in the Biological Opinion and by BLM).

4.3.3 Flora

Direct Impacts

Operation of the BSPP would not result in temporary or permanent, direct impacts to non-listed, special status plant species, as they will not occur within the disturbance area following construction.

Indirect Impacts

Operation of the BSPP could result in permanent indirect impacts to non-listed, special status plant species. Erosion and stormwater contaminant runoff may degrade adjacent habitat for non-listed, special status plant species. Exotic plant species are opportunistic and often occupy disturbed soils such as those within the transmission line corridors and areas of exposed bare ground that may occur within the disturbance area. Exotic plant species often outcompete natives for resources resulting in a reduction in growth, future dispersal, and recruitment of native species. These impacts would be considered significant if left unmitigated where non-listed, special status plant species occur adjacent to the disturbance area.

Significance after Mitigation

Potential operation-related indirect impacts to special status plant species occurring within the buffer would be reduced to less than significant through implementation of the avoidance, minimization, and mitigation measures as noted in Chapter 5 (i.e., implementation of measures from the 2009 BRTR, as well as eventual CEC Conditions of Certification and requirements specified in the Biological Opinion and by BLM).

4.3.4 Wildlife Species

Direct Impacts

Direct impacts to wildlife species would occur from mortality of individuals by crushing or vehicle collisions during operation and maintenance activities.

Indirect Impacts

Operation of the BSPP could result in permanent, indirect impacts to special status wildlife species, which includes edge effects, where facilities would lead to increased lighting and exotic plant and wildlife invasion. Operation of facilities would not lead to increased noise greater than 60 dBA (A-weighted decibels) outside the disturbance area. Nighttime lighting could disrupt species movement and/or cause increased predation rates. Wildfires caused by downed transmission lines are rare but may occur and damage adjacent habitat. Evaporation ponds also may attract ravens in numbers beyond those afforded by the normal, arid conditions extant in the Project vicinity. A larger raven population increases the potential for predation of juvenile desert tortoises. Additionally, the evaporation ponds also represent an attractant to other migratory and resident avian species. Chemicals present in the evaporation pond water potentially could be harmful to these species.

Significance after Mitigation

Potential operation-related direct and indirect impacts to special status wildlife species occurring or assumed to occur within the buffer (i.e., DT, MFTL, WBO, loggerhead shrike, American badger, and desert kit fox) would be reduced to less than significant through implementation of the avoidance, minimization, and mitigation measures as noted in Chapter 5 (i.e., implementation of measures from the 2009 BRTR, as well as eventual CEC Conditions of Certification and requirements specified in the Biological Opinion and by BLM).

4.3.5 Wildlife Movement

Direct Impacts

Operation of the BSPP would not result in any additional direct impacts to wildlife movement beyond those described in Section 4.2.5.

Indirect Impacts

Operation of the BSPP would not result in any additional indirect impacts to wildlife movement beyond those described in Section 4.2.5.

Significance after Mitigation

Operation of the BSPP would not result in any additional significant impacts to wildlife movement; thus, no avoidance, minimization, and mitigation measures are necessary.

4.4 CUMULATIVE IMPACTS

This section addresses the potential additive impacts of implementing the BSPP in combination with other past, present, and reasonably foreseeable projects in proximity to the BSPP. The BSPP involves the development of land that is currently owned by BLM and functions as open space. Impacts to biological resources have the potential to occur primarily in native habitat.

The multiple projects proposed on BLM land are either solar power or transmission projects and are identified in Attachment I. The BLM ROW for multiple solar projects on BLM land would use up to approximately 100,000 acres of desert lands along the I-10 corridor, between 2010 and roughly 2014, based on currently available data. The actual disturbance area of these projects will be considerably smaller, perhaps around 20,000 acres. It should be noted that this acreage total assumes that all the projects that have been proposed will in fact be constructed, which is considered highly unlikely. Refer to Attachment I, for detailed information on projects considered for this cumulative analysis. The development of 20,000 acres would unavoidably impact biological resources currently found on the various project sites and would cumulatively reduce the available habitat for special status species such as DT, WBO, MFTL. Only one (Palen Solar Power Project) of the 14 projects slightly overlaps with DT critical habitat found predominately to the south of I-10. The other 13 projects do not overlap with DT critical habitat (Figure 23).

Table 23 displays the potential cumulative loss of habitat for each special status species. The large acreage assumed to be developed in each of the various projects would impact wildlife movement and fragment species populations despite mitigation (i.e., the permanent protection of offsite habitat for these species). Since most of the projects are in the valleys and along the I-10 corridor, this could potentially reduce movement and impair gene flow among species populations. Through the project-specific environmental review process, these various projects would individually be required to mitigate their own impacts through measures such as providing suitable habitat at an agency agreed-upon ratio for the affected species to compensate for the habitat loss. Acquired mitigation lands should be planned with consideration of providing local movement between areas of open space and between NECO-designated WHMAs and DWMAs. The BSPP will fully mitigate impacts to biological resources. This would be the case regardless

of whether the Proposed Project or Reconfigured Alternative were implemented. Because BSPP impacts would be fully mitigated, the cumulative contribution of the Project would be less than significant.

Table 23
Potential Cumulative Impacts to Biological Resources[a]

Resource Name	Number of Projects[b]	Total ROW Acres of Potential Suitable Habitat		Total ROW Acres of Potential Suitable Habitat to be Developed	
		Occupied	Unoccupied	Occupied	Unoccupied
Vegetation					
Desert Dry Wash Woodland	2	7,724	N/A	150	N/A
Plants					
Harwood's Milkvetch	1	0	14,095	0	1,911
Wildlife					
Desert Tortoise	9	37,904	49,478	29,115	8,292
Western Burrowing Owl	4	34,820	29,669	30,900	1,797
Desert Kit Fox	1	25,000	0	25,000	0
Loggerhead Shrike	1	4,640	0	1,800	0
Mojave Fringe-toed Lizard	5	49,484	0	8,531	0

[a] Acreages depicted in this table represent a gross-level preliminary analysis of proposed projects based on preliminary project information in most cases; as a result, these acreages are subject to change and should be used as a guideline only.
[b] Proposed Project and Reconfigured Alternative not included.

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CHAPTER 5
AVOIDANCE, MINIMIZATION, AND CONSERVATION MEASURES

The findings and impacts identified during the Spring 2010 surveys documented in this report do not result in any new significant information or conclusions not previously identified and would not require new or expanded mitigation measures beyond those already defined in previous sources, beyond the update of impact acreages for calculation of compensatory mitigation. Avoidance, minimization, and mitigation measures will come from several sources as described below and would apply to the Proposed Project or the Reconfigured Alternative:

- The list of general and resource-specific impact avoidance and minimization measures that would apply to construction-related activities is included in the 2009 BRTR (AECOM 2009a). The measures are standard practices designed to prevent environmental degradation, and the Applicant will be responsible for implementation of the measures to avoid and minimize impacts to the greatest extent feasible.
- The RSA provided the CEC staff's proposed Conditions of Certification to be implemented to avoid and minimize impacts to biological resources. (Note: The CEC licensing process is legally a CEQA-equivalent process.) The Applicant has requested revisions to the Conditions of Certification in their response to the SA/DEIS docketed with the CEC on April 19, 2010 and their Initial Testimony docketed with the CEC on June 11, 2010. The Proposed Members Proposed Decision and Final EIS will provide the final Conditions of Certification and measure agreed upon to be implemented for the Project.
- The Biological Opinion, as issued by USFWS will include reasonable and prudent measures (necessary to minimize impact to listed species); terms and conditions (these implement the reasonable and prudent measures); reporting requirements; and conservation measures.

A Biological Resources Mitigation Implementation and Monitoring Plan (BRMIMP) will be developed for review by the CEC as a Condition of Certification. The BRMIMP will comprehensively describe and correlate all avoidance, minimization, and mitigation measures, and will provide a matrix of avoidance, minimization, and mitigation measures that will be implemented from each source document for each species. The BRMIMP will track and document implementation of avoidance, minimization, and mitigation measures and monitor their effectiveness.

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CHAPTER 6
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ATTACHMENT A

FIGURES

Map Location

1 inch = 40 miles

0 40 80 Miles

Blythe Solar Power Project
Biological Technical Report

Figure 1
Regional Map

Source: ESRI; AECOM 2010

AECOM

Date: June 2010

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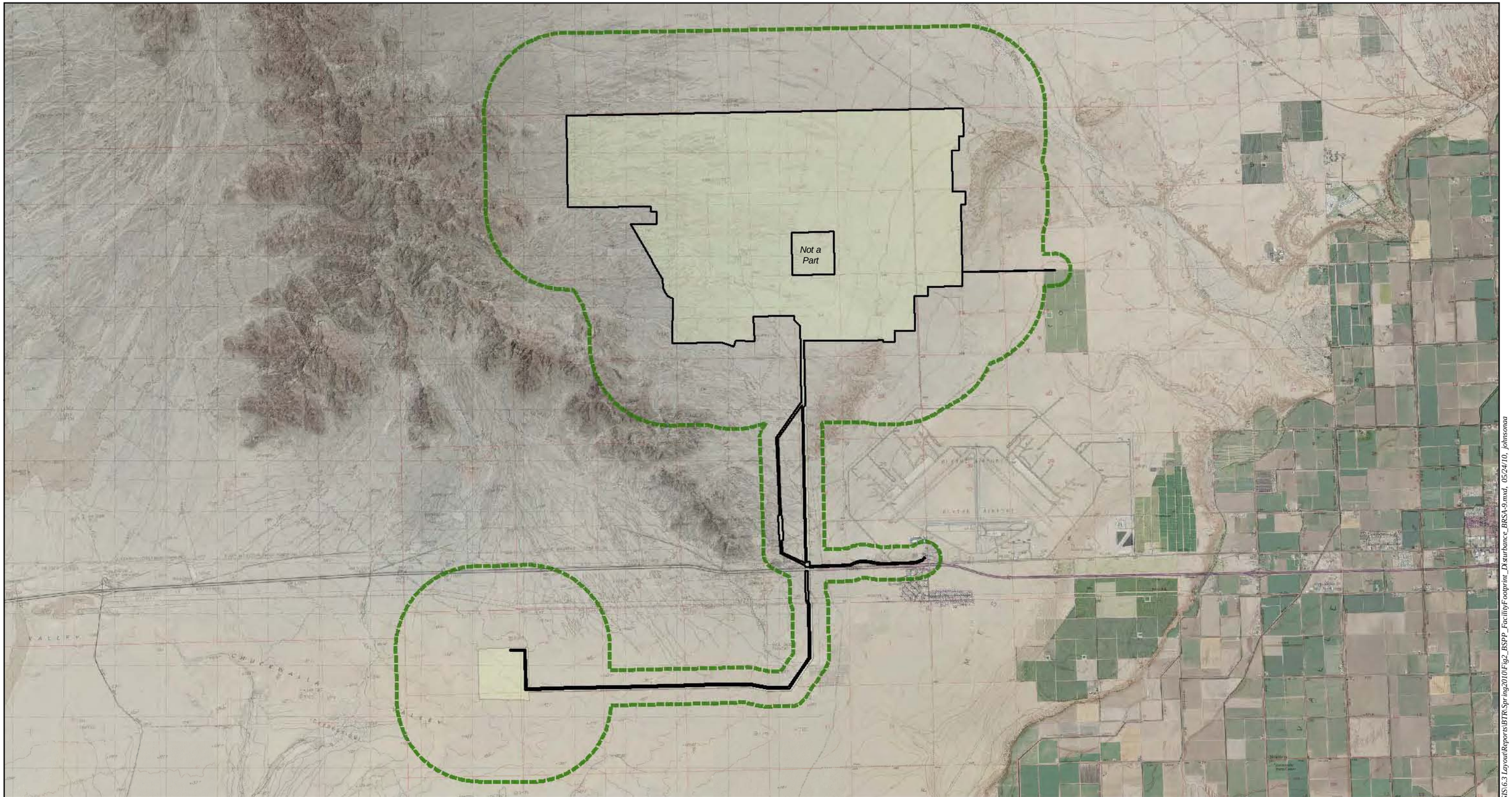

Map Location

Legend

- Proposed Project Study Area
- Project Disturbance Area
- Proposed Project BRSA

Source: NAIP 2009; AECOM 2010

N
W E
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1 in = 6,000 feet

0 6,000 12,000 Feet

Blythe Solar Power Project
Biological Technical Report

Figure 2
Proposed Project Disturbance Area and Biological Resources Survey Area

AECOM

Date: June 2010

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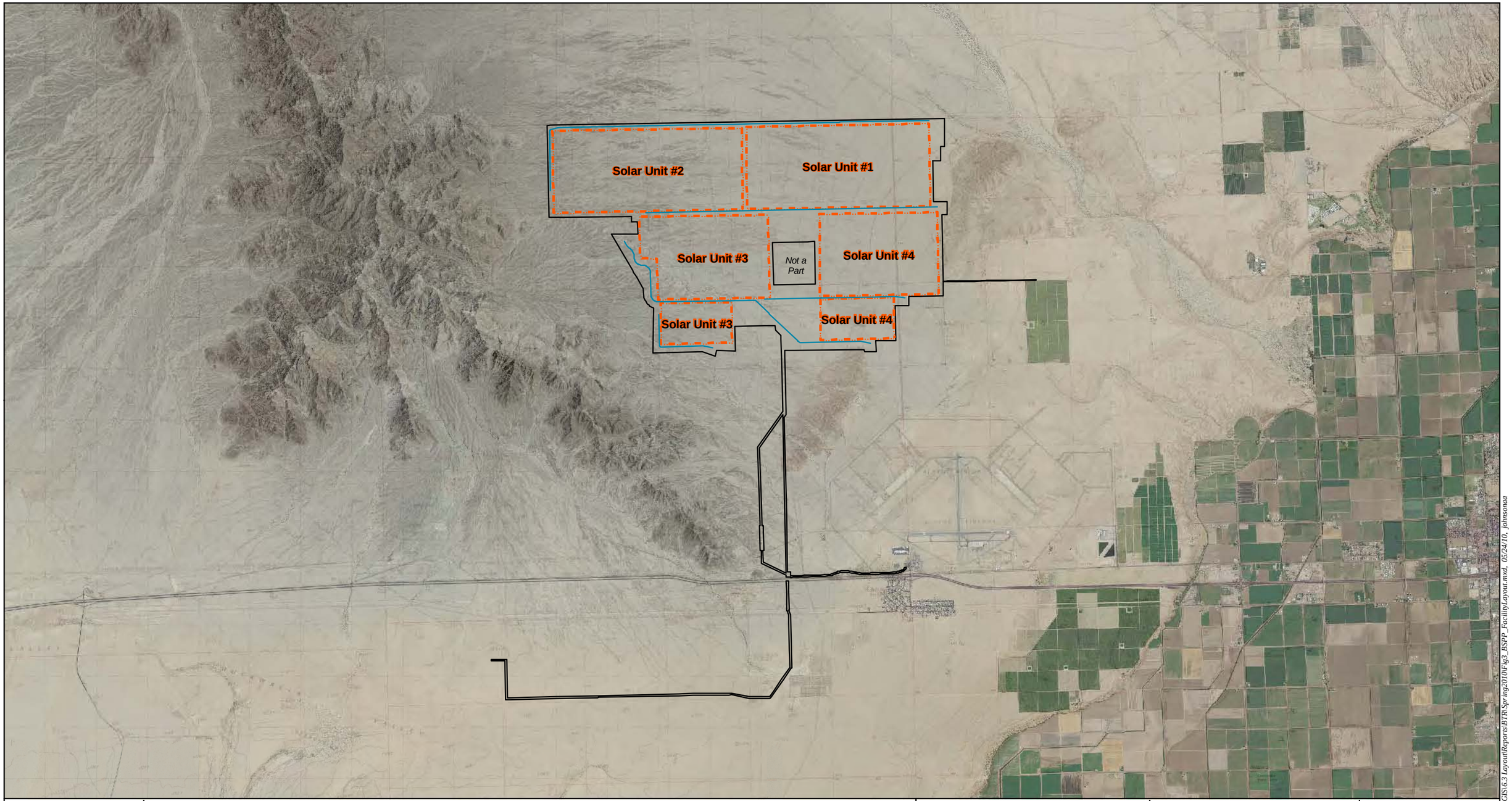

Map Location

Legend

Proposed Project Disturbance Area

Facilities Layout

Solar Unit

Rerouted Drainage

Source: NAIP 2009; ESRI; AECOM 2010; EDAW 2009

N
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1 in = 6,000 feet

0 6,000 12,000 Feet

Blythe Solar Power Project
Biological Technical Report

Figure 3
Proposed Project
Facility Layout

AECOM

Date: June 2010

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Map Location

Legend

Reconfigured Alternative Disturbance Area

Reconfigured Alternative BRSA

Source: NAIP 2009; AECOM 2010

N
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1 in = 6,000 feet

0 6,000 12,000 Feet

Blythe Solar Power Project
Biological Technical Report

Figure 4
Reconfigured Alternative Disturbance Area and Biological Resources Survey Area

AECOM

Date: June 2010

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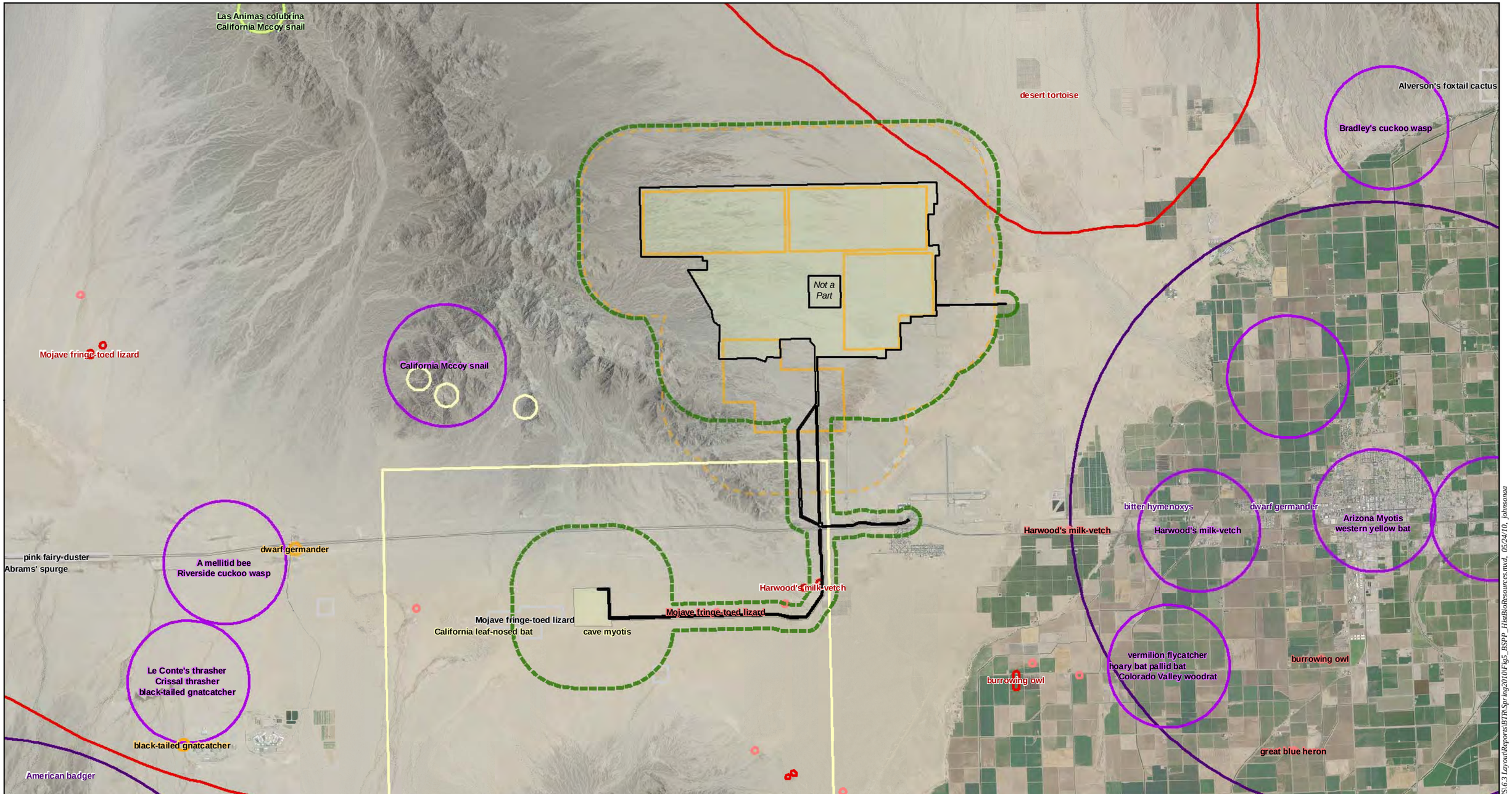

Map Location

Legend

- Proposed Project Study Area
- Proposed Project Disturbance Area
- Proposed Project BRSA
- Reconfigured Alternative Disturbance Area
- Reconfigured Alternative BRSA

Source: NAIP 2009; AECOM 2010; EDAW 2009; DFG 2009

CNDDB Species Inventory

Accuracy

- Specific Bounded Area
- Specific Bounded Area with 1/20-mile radius
- Feature with 1/10-mile radius
- Feature with 1/5-mile radius
- Feature with 2/5-mile radius
- Feature with 3/5-mile radius
- Feature with 4/5-mile radius
- Feature with 1-mile radius
- Feature with 5-mile radius
- Non-specific Area

N W E S

1 in = 8,000 feet

0 8,000 16,000 Feet

Blythe Solar Power Project
Biological Technical Report

Figure 5
Biological Resources
Regional Database

AECOM

Date: June 2010

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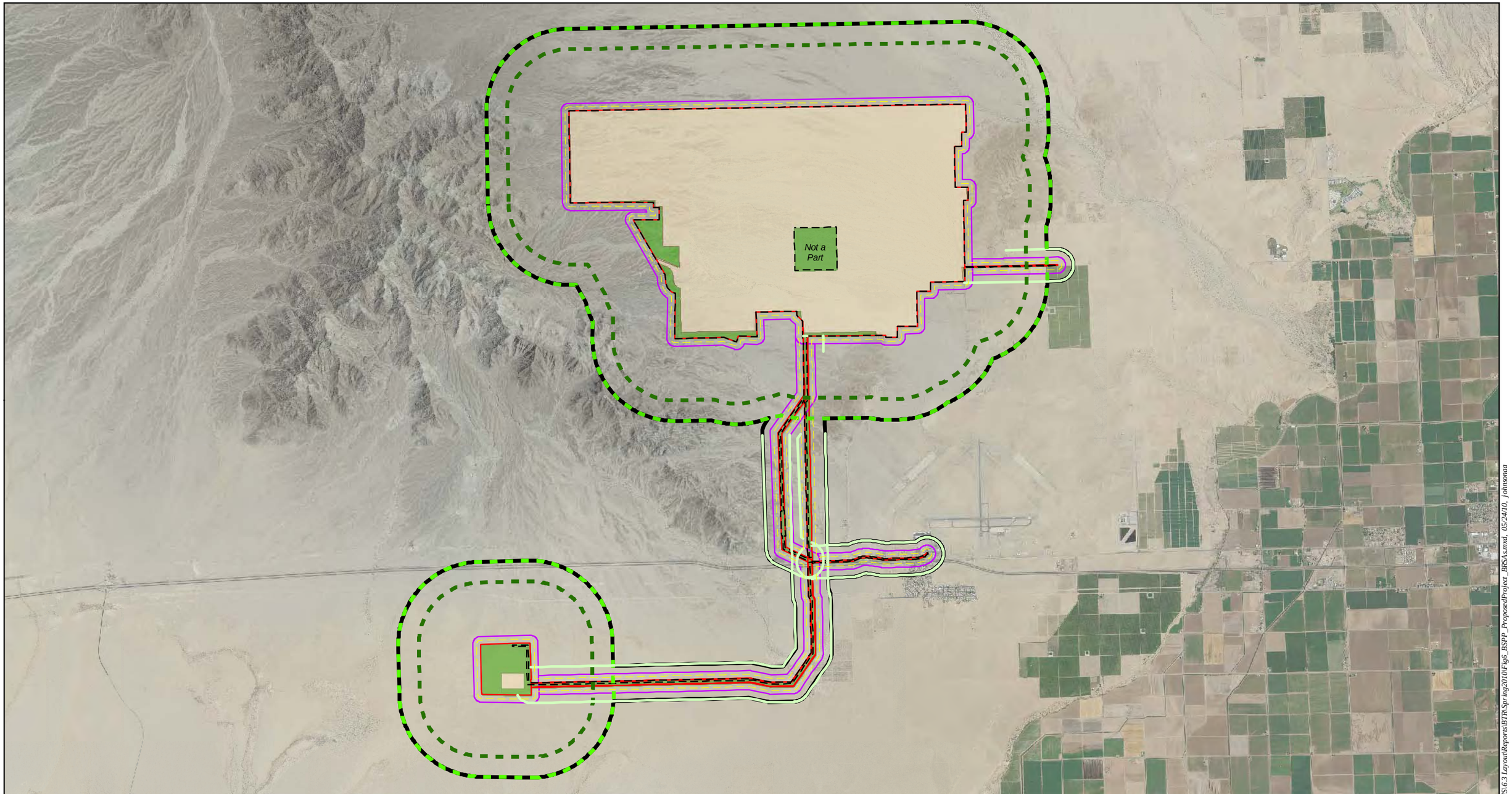


Map Location

Legend

Proposed Project Study Area
Proposed Project Disturbance Area

Survey Areas 2009-2010

Surveyed 2009-2010
Surveyed 2010

Desert Tortoise Buffer Transects

Proposed Project 1-mile Transect
Proposed Project 3/4-mile Transect
Proposed Project 1000-foot Transect

Western Burrowing Owl Survey Buffer

CBOC 492-foot Buffer

Jurisdictional Waters

Proposed Project Desert Aquatic Resources Survey Area (DARSA)

Botanical Surveys

Proposed Project BRSA

Source: NAIP 2009; AECOM 2010

N
W E
S

1 in = 6,000 feet

0 6,000 12,000 Feet

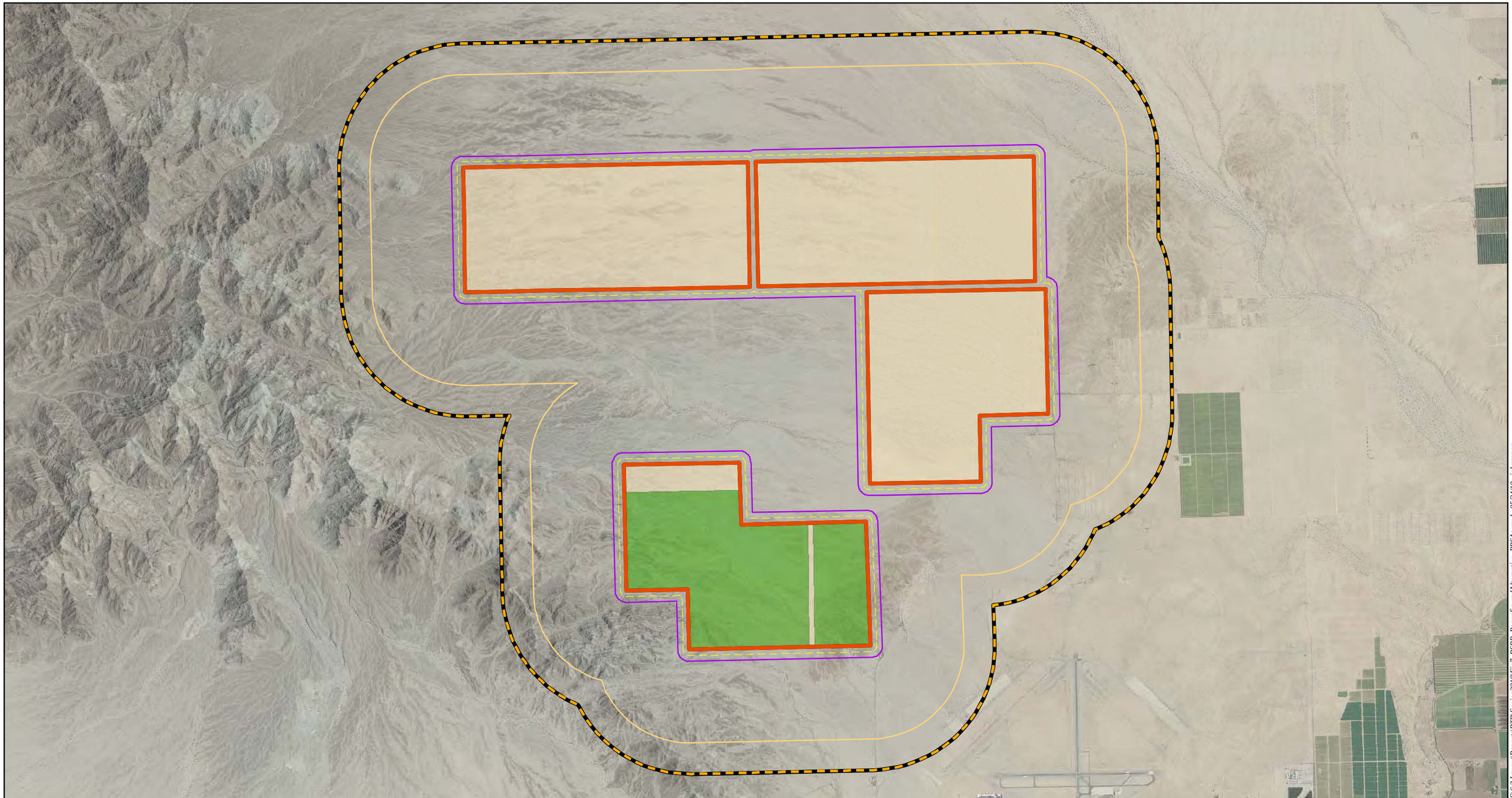
Blythe Solar Power Project
Biological Technical Report

Figure 6
Proposed Project
Biological Resource
Survey Area

AECOM

Date: June 2010

Path: P:\209\09080082 Sol Mil Blythe\6.0 GIS\6.3 Layout\Reports\BTR\Spring2010\Fig6_BSPP_ProposedProject_BRSAs.mxd, 05/24/10, johnsonda



Map Location

Legend

- Reconfigured Alternative Disturbance Area

Survey Areas 2009-2010

- Surveyed 2009-2010
- Surveyed 2010

Jurisdictional Waters

- Reconfigured Alternative Desert Aquatic Resources Area (DARSA)

Desert Tortoise Buffer Transects

- Reconfigured Alternative Disturbance Area 1-mile Transect
- Reconfigured Alternative Disturbance Area 3/4 mile Transect

Western Burrowing Owl Survey Buffer

- CBOC 492-foot Buffer

Botanical Surveys

- Reconfigured Alternative BRSA

Source: NAIP 2009; AECOM 2010

N W E S

1 in = 4,000 feet

0 4,000 8,000 Feet

Blythe Solar Power Project
Biological Technical Report

Figure 7
Reconfigured Alternative Biological Resource Survey Areas

AECOM

Date: June 2010

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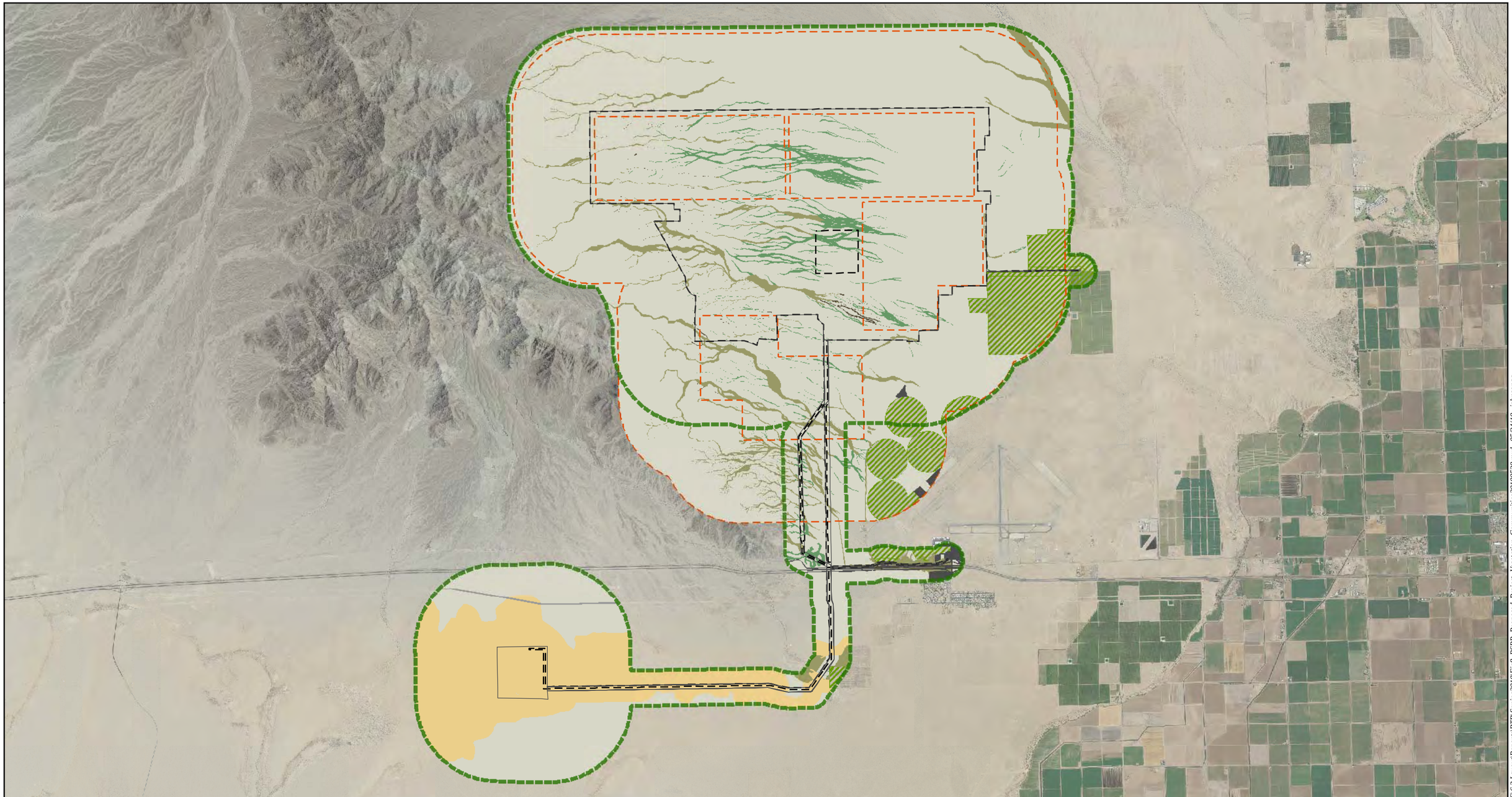

Map Location

Legend

- Proposed Project Study Area
- Project Disturbance Area
- Proposed Project BRSA
- Reconfigured Alternative Disturbance Area
- Reconfigured Alternative BRSA

Vegetation Communities

Riparian

- Creosote Bush - Big Galleta Association
- Desert Dry Wash Woodland
- Unvegetated Ephemeral Dry Wash

Upland

- Sonoran Creosote Bush Scrub
- Stabilized and Partially Stabilized Desert Dunes

Other

- Agriculture (Active and Fallow)
- Disturbed
- Developed

Source: NAIP 2009; AECOM 2010

N W E S

1 inch = 6,000 feet

0 6,000 12,000 Feet

Blythe Solar Power Project
Biological Technical Report

Figure 8
Vegetation Communities

AECOM

Date: June 2010

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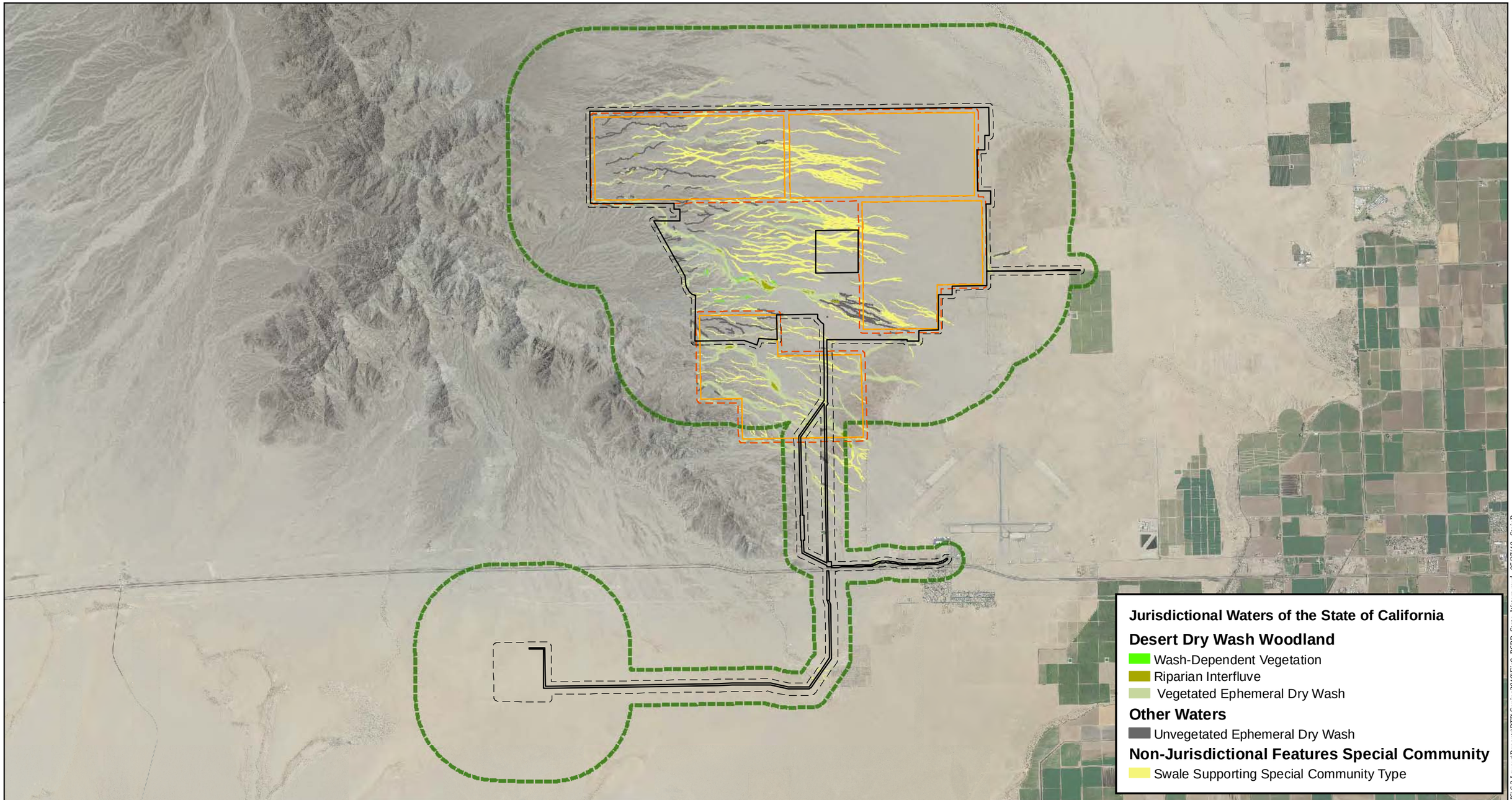

Map Location

Legend

- Project Disturbance Area
- Proposed Project BRSA
- Proposed Project Desert Aquatic Resources Survey Area
- Reconfigured Alternative Disturbance Area
- Reconfigured Alternative Desert Aquatic Resources Survey Area

Source: NAIP 2009; AECOM 2010

N W E S

1 in = 6,000 ft

0 6,000 12,000 Feet

Blythe Solar Power Project
Biological Technical Report

Figure 9
State Waters

AECOM

Date: June 2010

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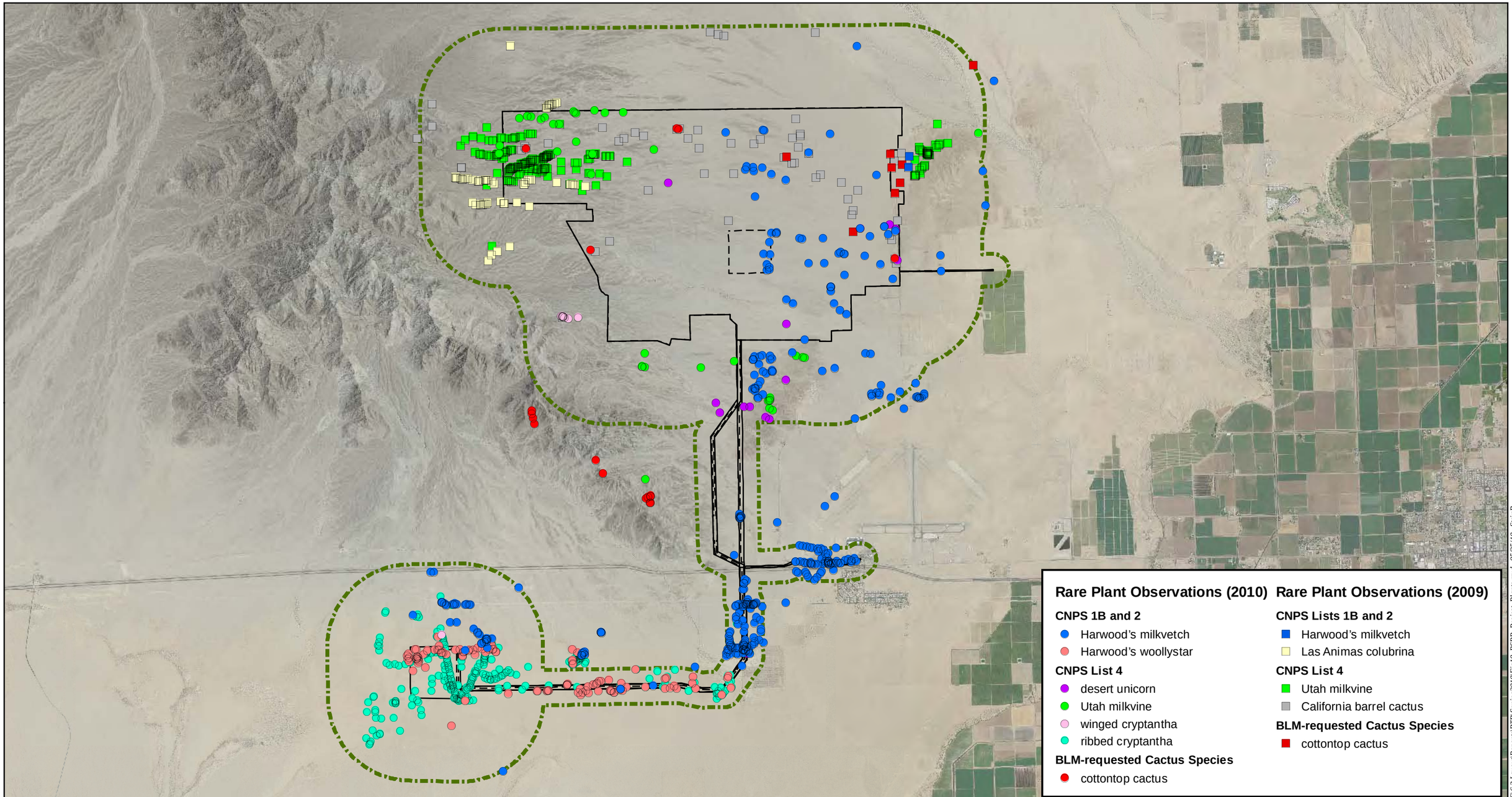

Map Location

Legend

- Proposed Project Study Area
- Proposed Project BRSA
- Project Disturbance Area

Source: NAIP 2009; EDAW 2009; AECOM 2010

N W E S

1 in = 6,000 feet

0 6,000 12,000 Feet

Blythe Solar Power Project
Biological Technical Report

Figure 10
Proposed Project Special Status Plant Species

AECOM

Date: June 2010

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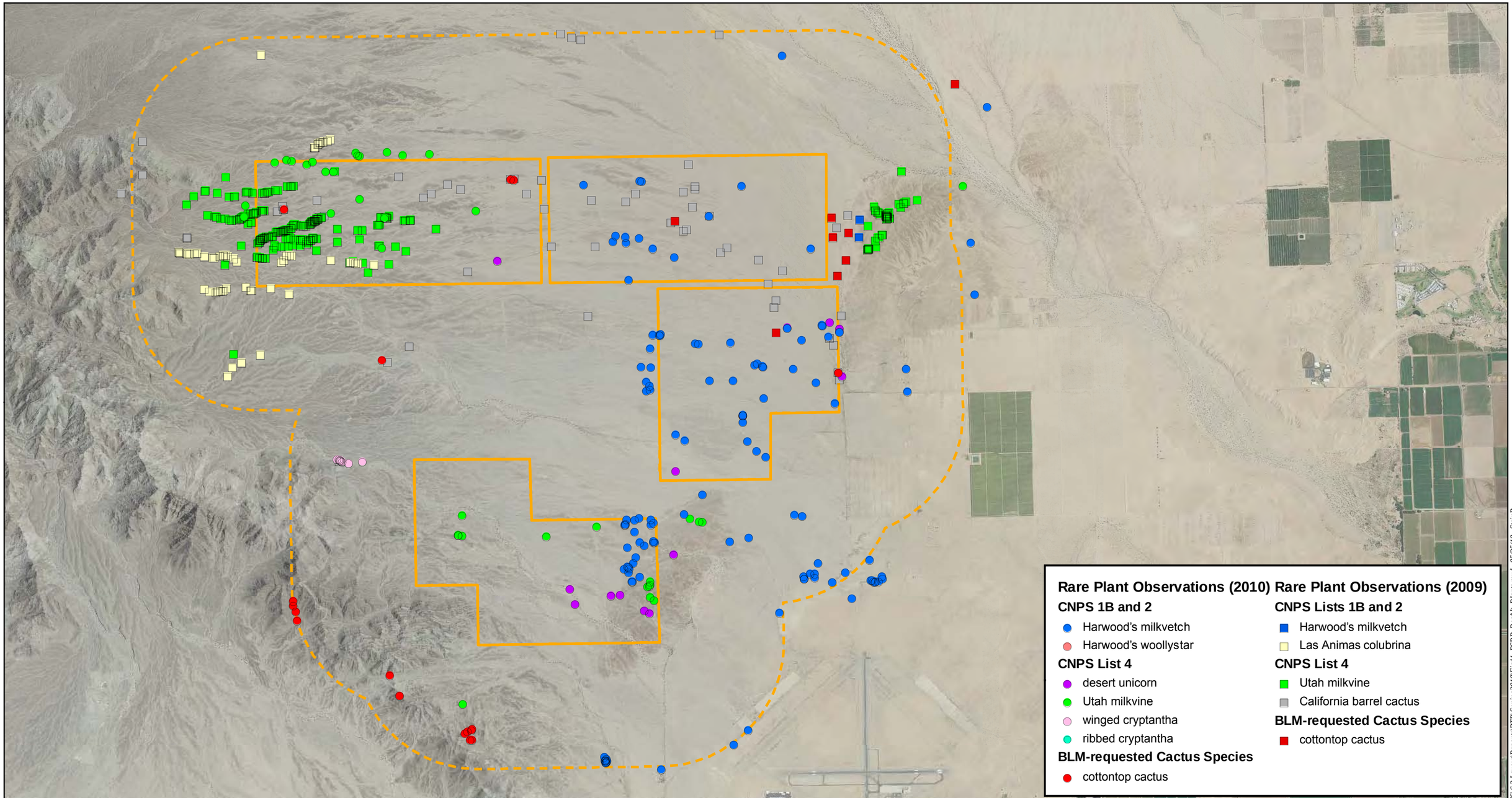

Map Location

Legend

Reconfigured Alternative Disturbance Area
Reconfigured Alternative BRSA

Source: NAIP 2009; EDAW 2009; AECOM 2010

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1 in = 4,000 ft

0 4,000 8,000 Feet

Blythe Solar Power Project
Biological Technical Report

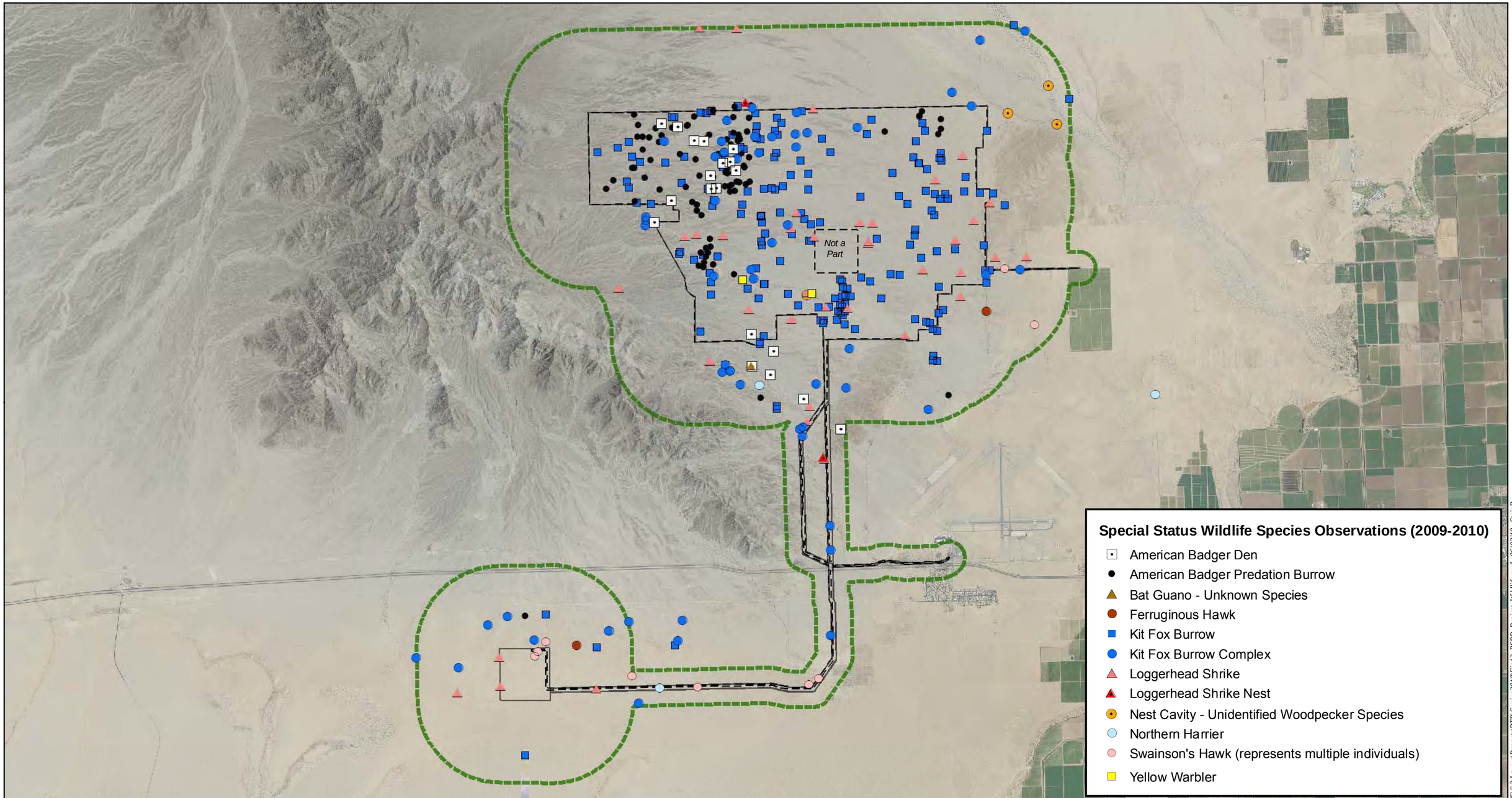
Figure 11
Reconfigured Alternative
Special Status Plant Species

AECOM

Date: June 2010

Path: P:\2009\09080082 Sol MI Blythe\6.0 GIS\6.3 Layout\Reports\BTR\Spring2010\Fig11_BSPP_RecAlt_Plants.mxd, 05/25/10, SteinB

Vegetation Communities



Map Location

Legend

- Proposed Project Study Area
- Project Disturbance Area
- Proposed Project BRSA

Source: NAIP 2009; AECOM 2009-2010

N W E S

1 inch = 6,000 feet

0 6,000 12,000 Feet

Blythe Solar Power Project
Biological Technical Report

Figure 12
Proposed Project
Special Status Wildlife

AECOM

Date: June 2010

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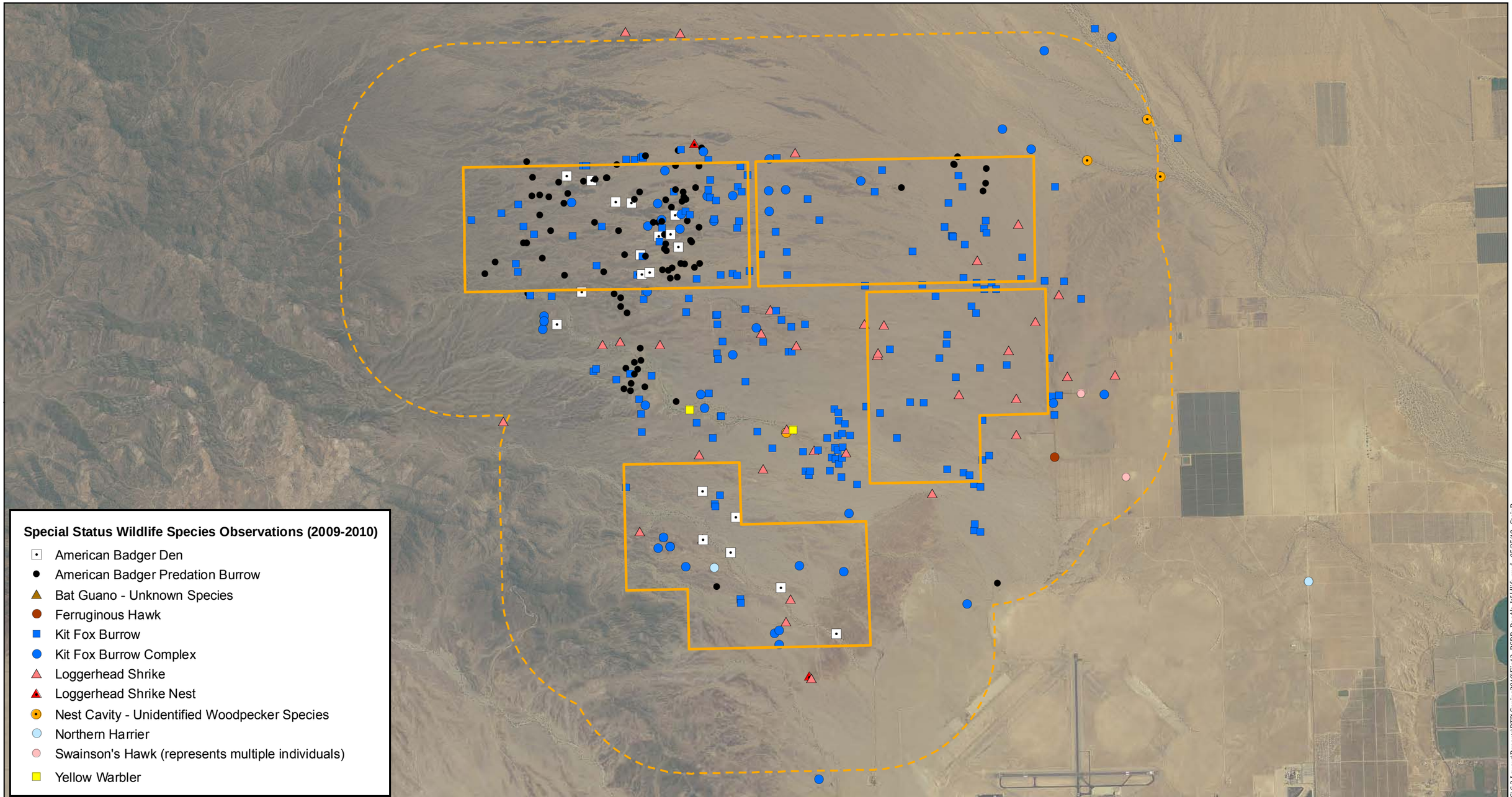


Map Location

Legend

Reconfigured Alternative Disturbance Area

Reconfigured Alternative BRSA

Source: NAIP 2009; AECOM 2009-2010

N
W E
S

1 inch = 4,000 feet

0 4,000 8,000 Feet

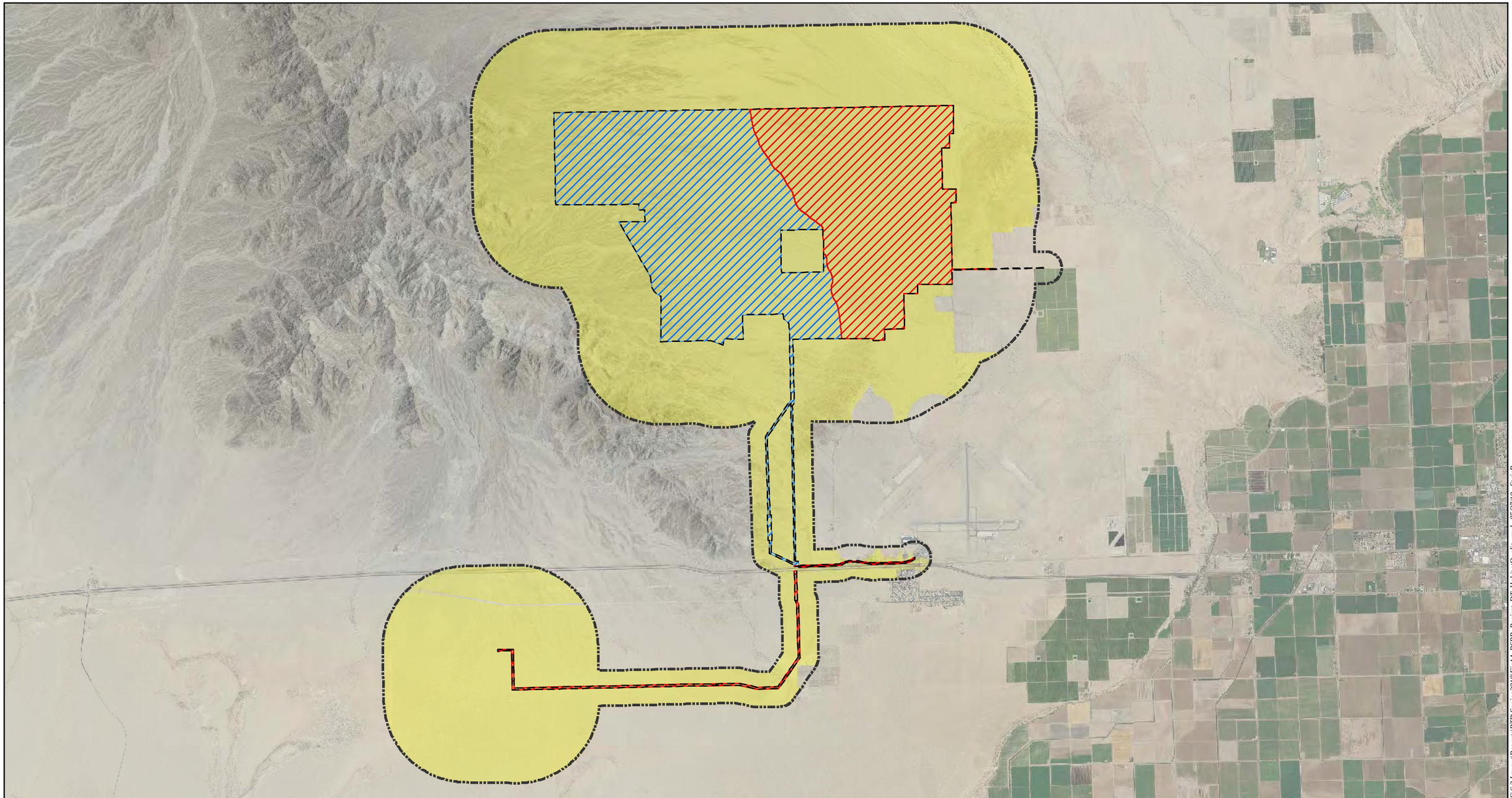
Blythe Solar Power Project
Biological Technical Report

Figure 13
Reconfigured Alternative
Special Status Wildlife

AECOM

Date: June 2010

Path: P:\2009\0980082 Sol Mil Blythe\6.0 GIS\6.3 Layout\Reports\BTR\Spring2010\Fig13_BSPP_RecAlt_Wildlife.mxd, 05/25/10, SteinB



Map Location

Legend

- Project Disturbance Area
- Proposed Project BRSA
- DETO Suitable Habitat

Suitable Habitat Quality

- Low-Quality DETO Habitat
- Moderate-Quality DETO Habitat

Source: NAIP 2009; USGS; AECOM 2009

N W E S

1 inch = 6,000 feet

0 6,000 12,000 Feet

Blythe Solar Power Project
Desert Tortoise Technical Report

Figure 14
Desert Tortoise Suitable Habitat Within the Proposed Project Biological Resources Survey Area

AECOM

Date: June 2010

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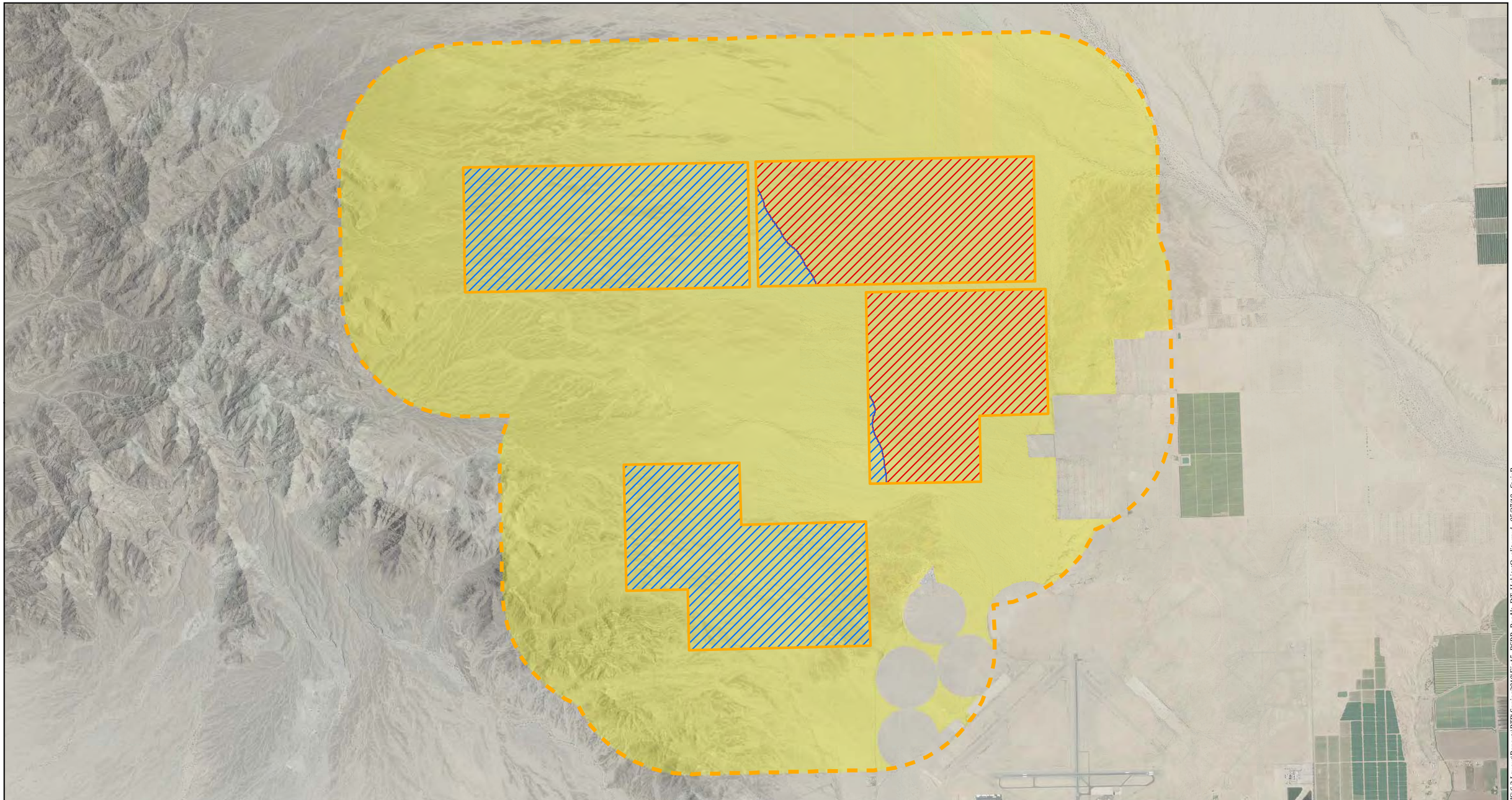


Map Location

Legend

- Reconfigured Alternative Disturbance Area
- Reconfigured Alternative BRSA
- DETO Suitable Habitat

Suitable Habitat Quality

- Low-Quality DETO Habitat
- Moderate-Quality DETO Habitat

Source: NAIP 2009; USGS; AECOM 2009

N W E S

1 inch = 4,000 feet

0 4,000 8,000 Feet

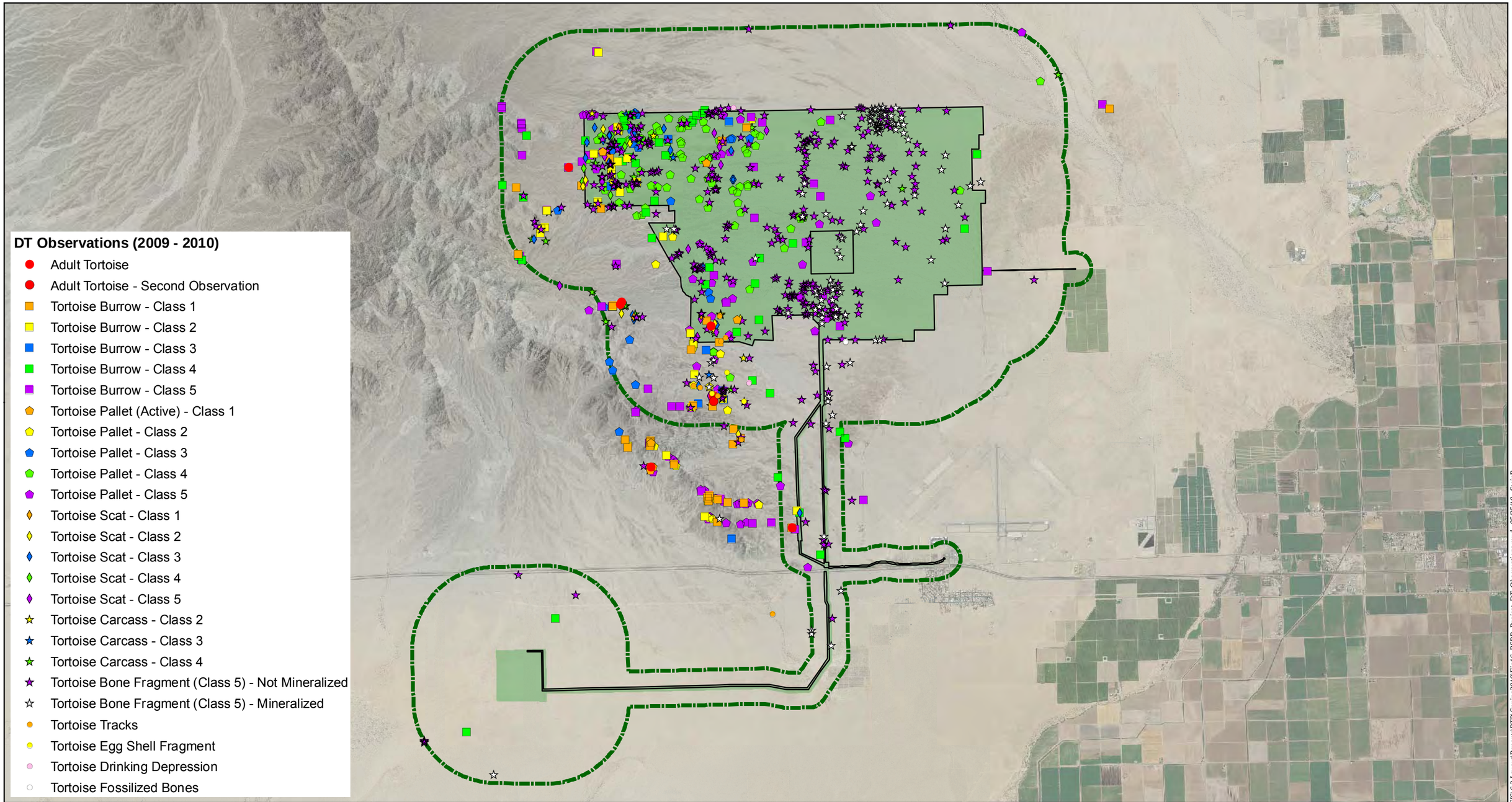
Blythe Solar Power Project
Biological Technical Report

Figure 15
Desert Tortoise Suitable Habitat within the Reconfigured Alternative Biological Resources Survey Area

AECOM

Date: June 2010

Path: P:\20090\60080082 Sol Mil Blythe\6.0 GIS\6.3 Layout\Reports\BTR\Spring2010\Fig15_BSPP_RecAlt_DT_HabitatQuality.mxd, 05/27/10, SteinB



Map Location

Legend

- Proposed Project Study Area
- Proposed Project Disturbance Area
- Proposed Project BRSA

Source: NAIP 2009; USGS; AECOM 2009

N W E S

1 inch = 6,000 feet

0 6,000 12,000 Feet

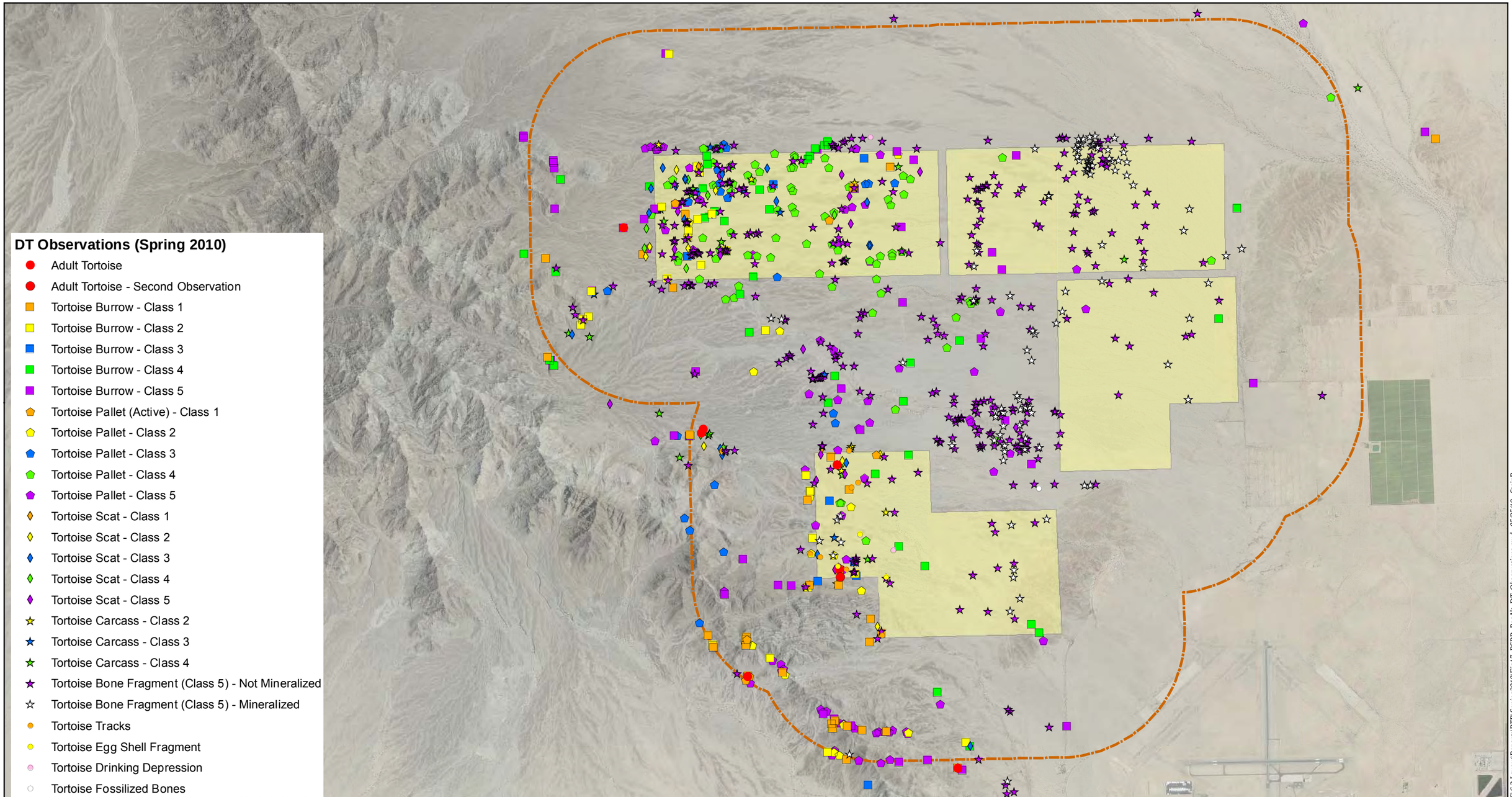
Blythe Solar Power Project
Biological Technical Report

Figure 16
Proposed Project Desert Tortoise Observations

AECOM

Date: June 2010

Path: P:\2009\0900082 Sol Mil Blythe\6.0 GIS\6.3 Layout\Reports\BTR\Spring2010\Fig16_BSPP_Project_DT_Observations.mxd, 05/25/10, SteinB



Map Location

Legend

Reconfigured Alternative Disturbance Area

Reconfigured Alternative BRSA

Source: NAIP 2009; USGS; AECOM 2009

N
W
E
S

1 inch = 4,000 feet

0 4,000 8,000 Feet

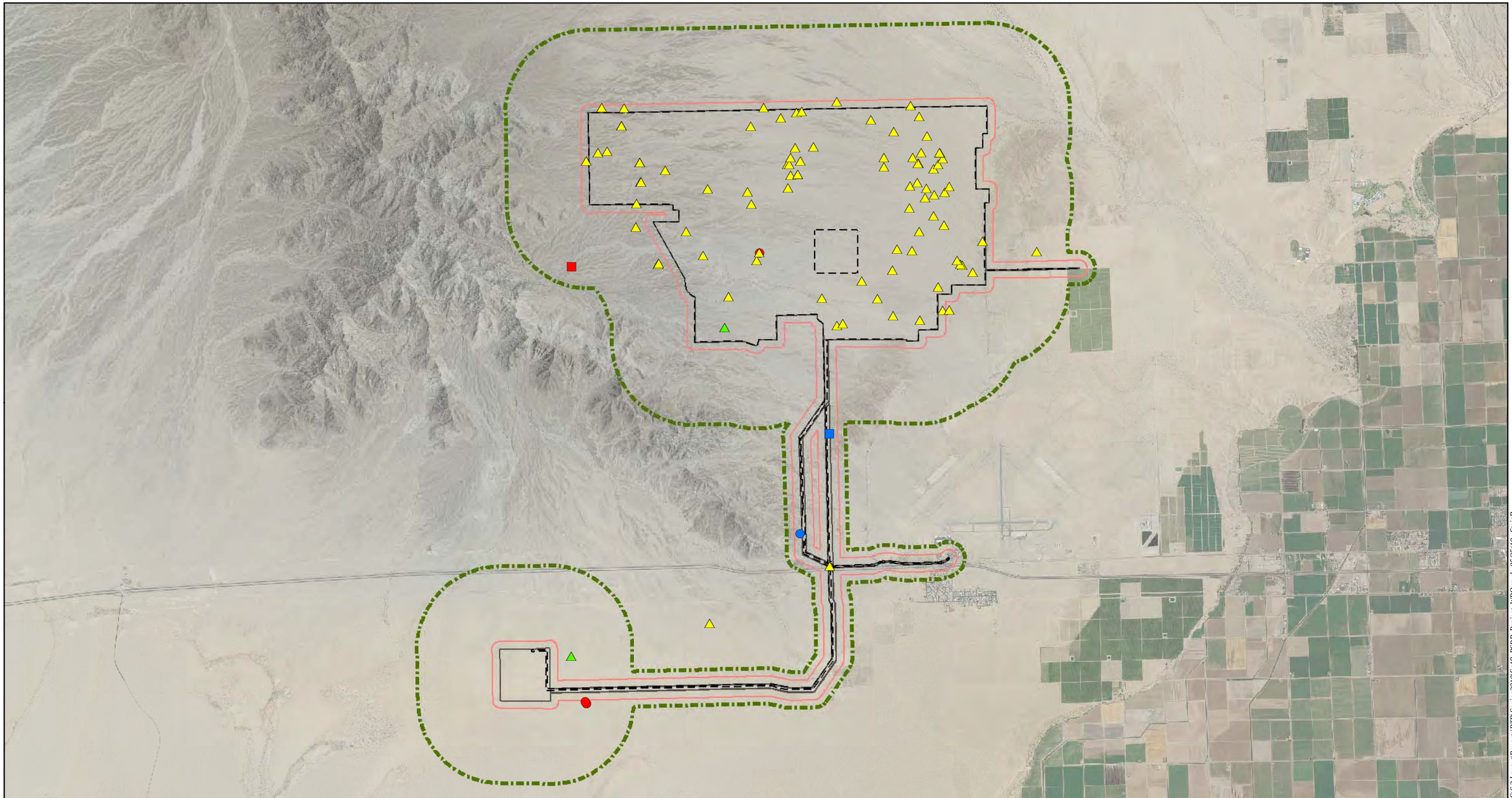
Blythe Solar Power Project
Desert Tortoise Technical Report

Figure 17
Reconfigured Alternative
Desert Tortoise Observations

AECOM

Date: June 2010

Path: P:\2009\09080082 Sol Mil Blythe\6.0 GIS\6.3 Layout\Reports\BTR\Spring2010\Fig17_BSPP_RecAlt_DT_Observations.mxd, 05/25/10, SteinB



Map Location

Legend

- Proposed Project Study Area
- Proposed Project BRSA
- Project Disturbance Area
- Burrowing Owl Survey Buffer - 492-foot

Western Burrowing Owl Observations 2010

- Western Burrowing Owl
- Western Burrowing Owl with Active Burrow
- Burrow with Sign

Observations 2009

- Western Burrowing Owl
- Western Burrowing Owl with Active Burrow
- Burrow with Sign

Source: NAIP 2009; AECOM 2010

N W E S

1 inch = 6,000 feet

0 6,000 12,000 Feet

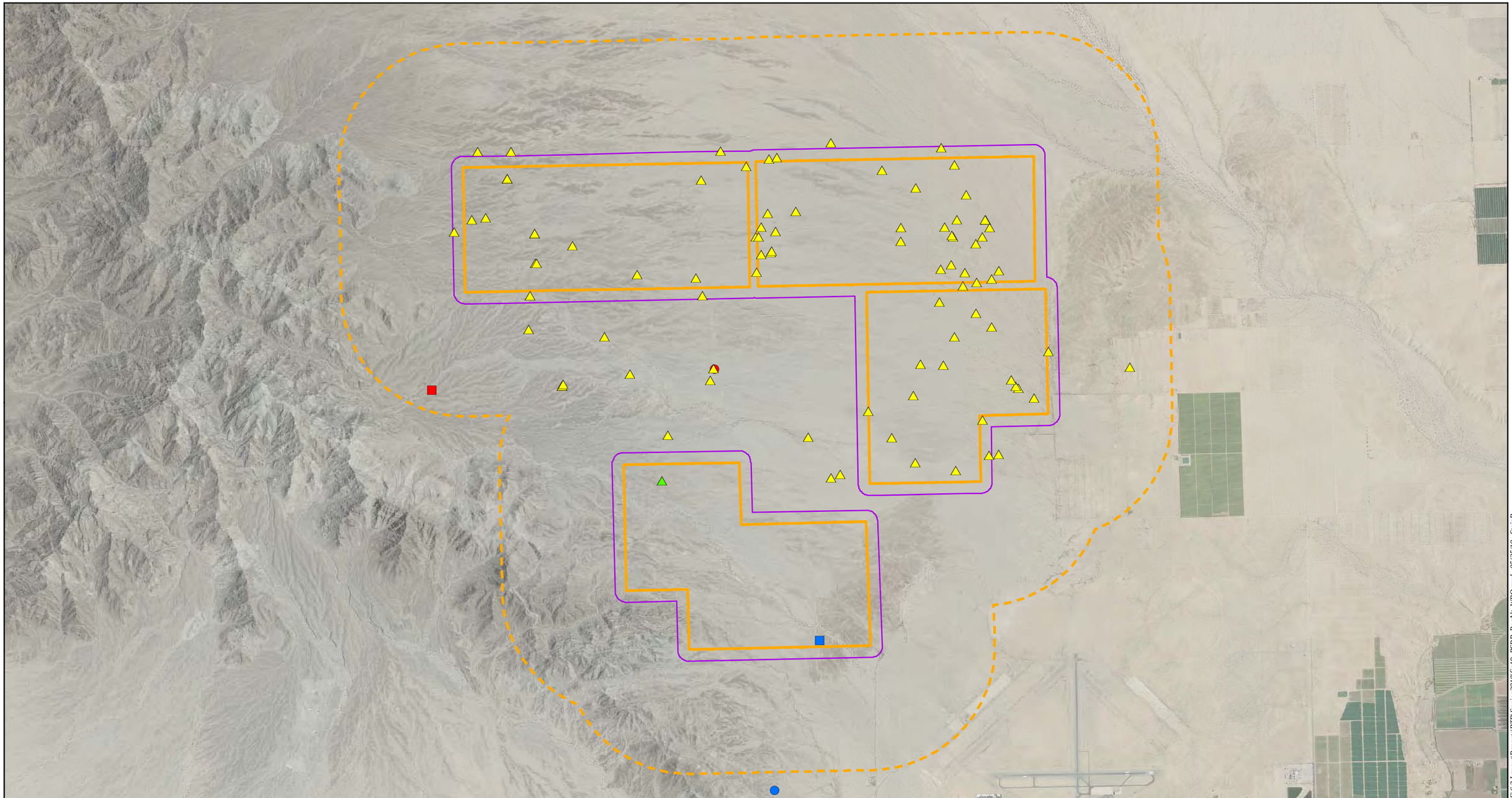
Blythe Solar Power Project
Biological Technical Report

Figure 18
Proposed Project Preliminary Burrowing Owl Observations

AECOM

Date: June 2010

Path: P:\20090\60080082 Sol MII Blythe\6.0 GIS\6.3 Layout\Reports\BTR\Spring2010\fig18_BSPP_Project_WBO.mxd, 05/25/10, SteinB



Map Location

Legend

- Reconfigured Alternative Disturbance Area
- Reconfigured Alternative BRSA
- Burrowing Owl Survey Buffer - 492-foot

Western Burrowing Owl

Observations 2010

- Western Burrowing Owl
- Western Burrowing Owl with Active Burrow
- Burrow with Sign

Observations 2009

- Western Burrowing Owl
- Western Burrowing Owl with Active Burrow
- Burrow with Sign

Source: NAIP 2009; EDAW 2009; AECOM 2010

N
W E
S

1 inch = 4,000 feet

0 4,000 8,000 Feet

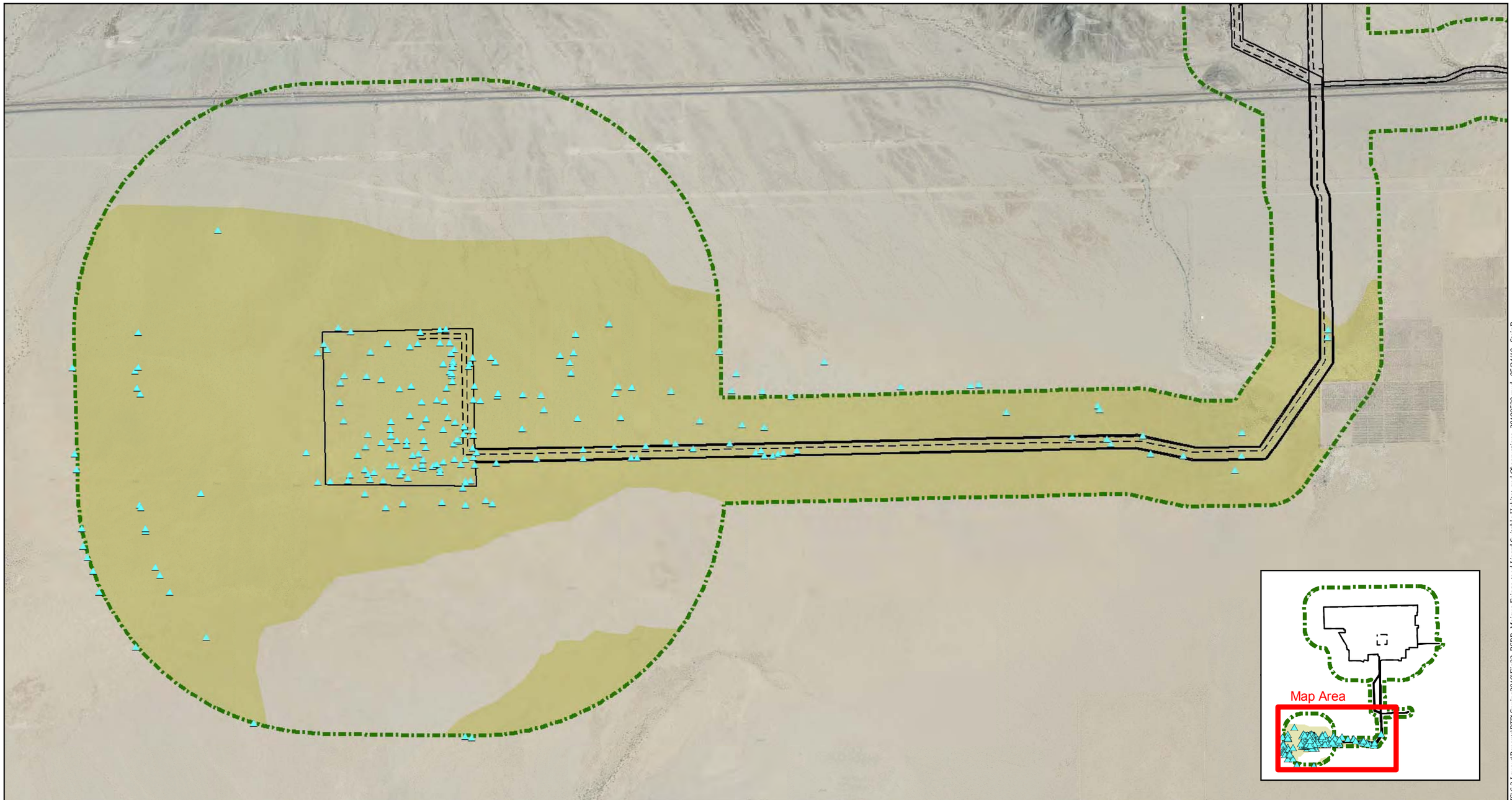
Blythe Solar Power Project
Biological Technical Report

Figure 19
Reconfigured Alternative Preliminary Burrowing Owl Observations

AECOM

Date: June 2010

Path: P:\20090\09080082 Sol Mil Blythe\6.0 GIS\6.3 LayoutReports\BTR\Spring2010\fig19_BSPP_ReAlt_WBO.mxd, 05/25/10, SteinB



Map Location

Legend

- Proposed Project Study Area
- Project Disturbance Area
- Proposed Project BRSA
- Mojave Fringe-toed Lizard Individual Observation (2009-2010)
- Suitable Habitat for Mojave Fringe-toed Lizard

Source: NAIP 2005; AECOM 2009-2010

N W E S

1 inch = 2,000 feet

0 2,000 4,000 Feet

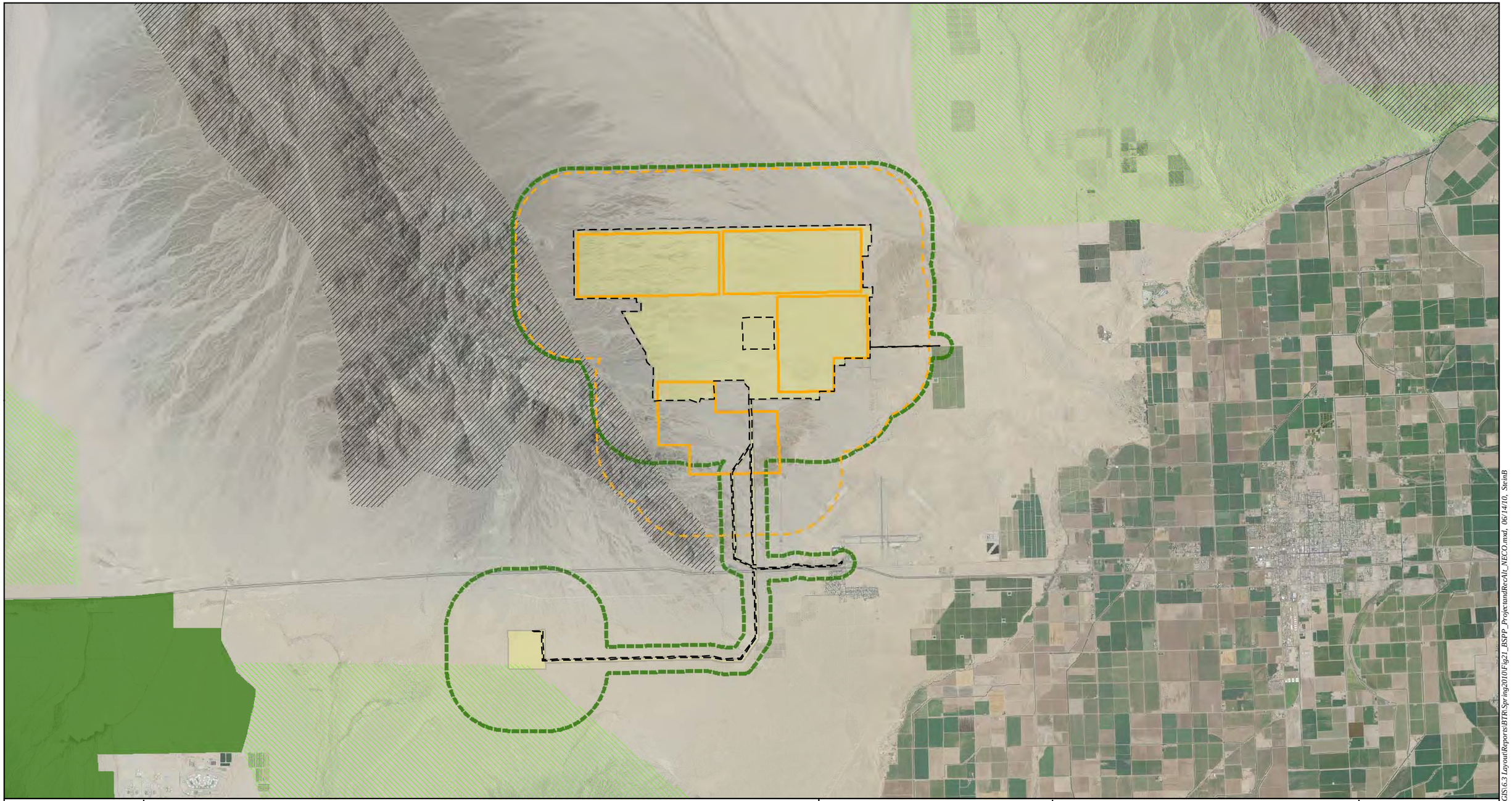
Blythe Solar Power Project
Biological Technical Report

Figure 20
Mojave Fringe-toed Lizard Suitable Habitat and Observations

AECOM

Date: June 2010

Path: P:\2009\09080082 Sol MI Blythe\6.0 GIS\6.3 Layout\Reports\BTR\Spring2010\Fig22_BSPP_Mojave Fringe-toed Lizard Suitable Habitat and Observations_20100520.mxd, 05/24/10, SteinB



Map Location

Legend

- Project Disturbance Area
- Proposed Project Study Area
- Proposed Project BRSA
- Reconfigured Alternative Disturbance Area
- Reconfigured Alternative BRSA

Desert Wildlife Management Area (NECO)

- Chuckwalla

Wildlife Habitat Management Area (NECO)

- Nelson's Bighorn Sheep
- Multiple Species

Source: NAIP 2005; AECOM 2010

N W E S

1 inch = 8,000 feet

0 8,000 16,000 Feet

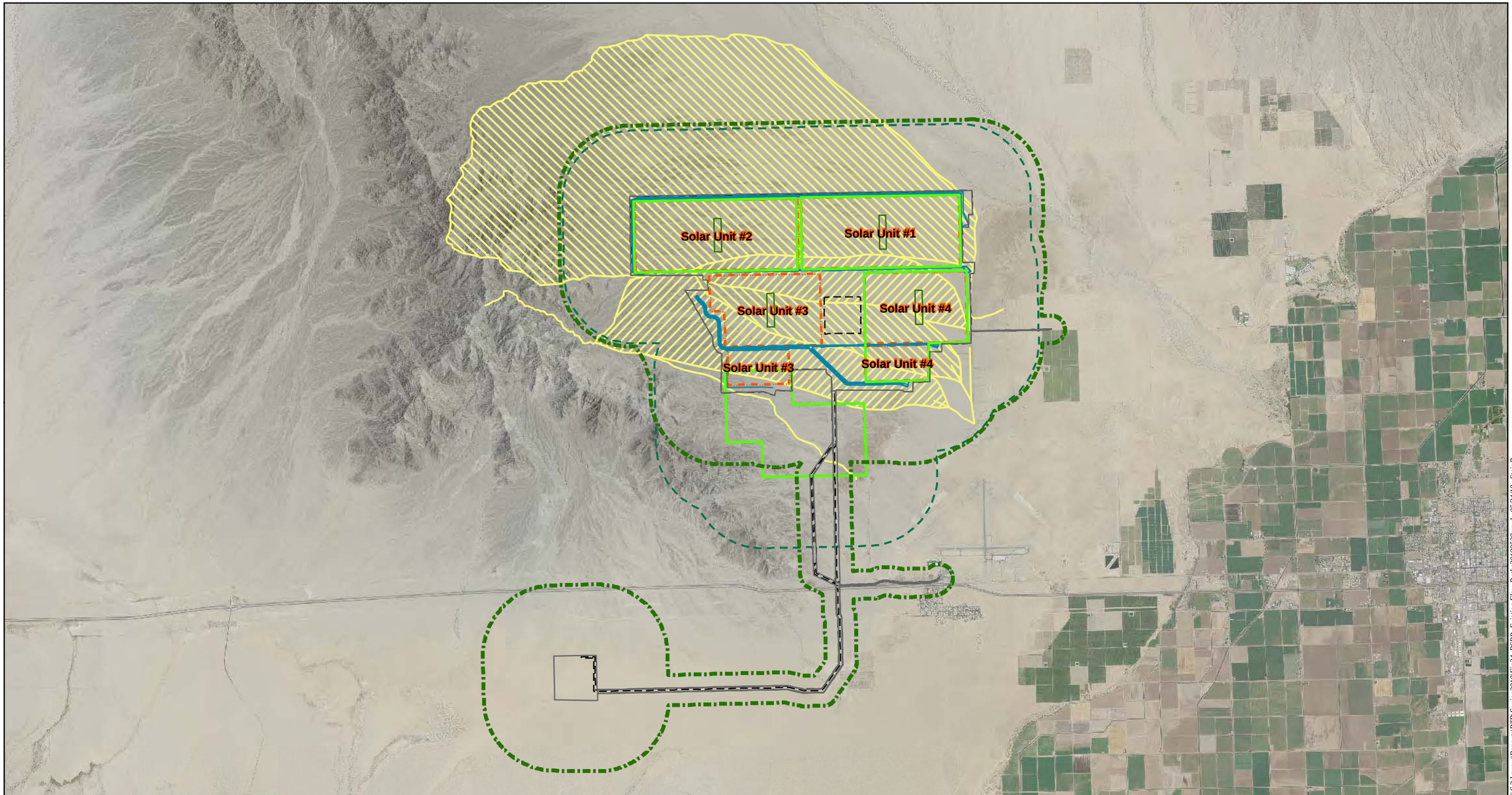
Blythe Solar Power Project
Biological Technical Report

Figure 21
Proposed Project and Reconfigured Alternative Relative to the Northern and Eastern Colorado Desert Coordinated Management Plan (NECO)

AECOM

Date: June 2010

Path: P:\2009\09080082 Sol Mil Blythe\6.0 GIS\6.3 Layout\Reports\BTR\Spring2010\Fig21_BSPP_ProjectandReconfig_NECO.mxd, 06/14/10, SteinB



Map Location

Legend

- Proposed Project Study Area
- Proposed Project BRSA
- Project Disturbance Area
- Reconfigured Alternative Disturbance Area
- Reconfigured Alternative BRSA

Facilities Layout

- Solar Unit
- Location of Power Block
- Existing Flow Paths
- Rerouted Drainage

Source: NAIP 2009; AECOM 2010

N W E S

1 in = 7,000 feet

0 7,000 14,000 Feet

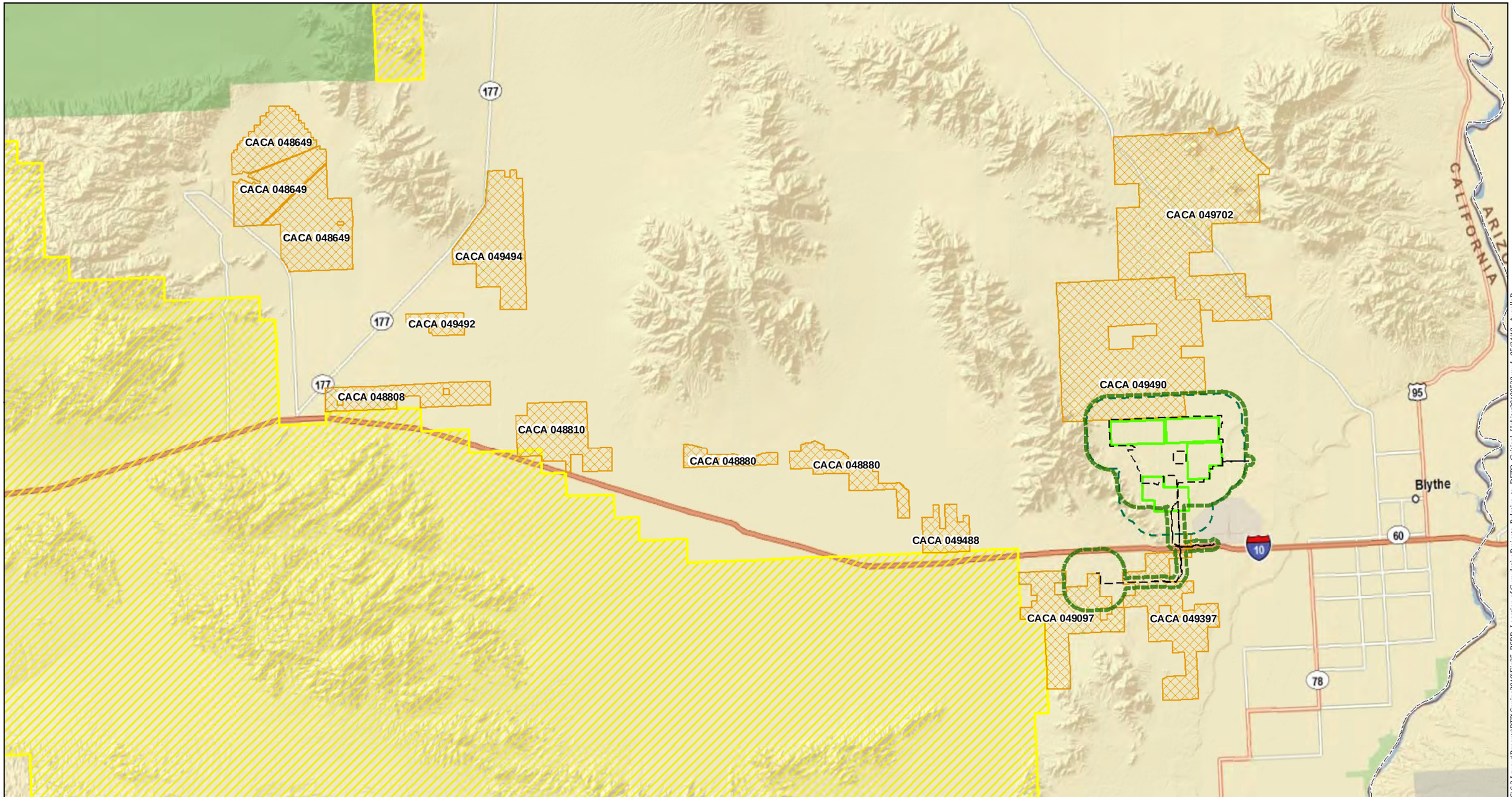
Blythe Solar Power Project
Biological Technical Report

Figure 22
Existing Flow Paths and Proposed Channels for the Proposed Project

AECOM

Date: June 2010

Path: P:\2009\0800082 Sol Mf Blythe\6.0 GIS\6.3 Layout\Reports\BTR\Spring2010\Fig24_BSPP_Existing Flow Paths20100520.mxd, 05/24/10, SteinB



Map Location

Legend

- Project Disturbance Area
- Proposed Project BRSA
- Reconfigured Alternative Disturbance Area
- Reconfigured Alternative BRSA
- Future Solar Projects
- Desert Tortoise Designated Critical Habitat (USFWS)

Source: ESRI 2010; USFWS 2009; AECOM 2010

N W E S

1 in = 4 miles

0 4 8 Miles

Blythe Solar Power Project
Biological Technical Report

Figure 23
Location of Cumulative Projects Relative to Desert Tortoise Critical Habitat

AECOM

Date: June 2010

Path: P:\20090908082 Sol MII Blythe\6.0 GIS\6.3 LayoutReports\BTR\Spring2010\Fig25_BSPP_Location of CumulativeProjects_Relative_to_DETO_Critical_Habitat20100520.mxd, 05/24/10, AngelloP

ATTACHMENT B

LIST OF FIELD BIOLOGISTS AND QUALIFICATIONS

ATTACHMENT B
LIST OF FIELD BIOLOGISTS AND QUALIFICATIONS

Name	Affiliation	Surveys Performed	Qualifications	Site		
				Palen	Blythe	Ridge.
Jason Phillips	AECOM	Aquatic Resources/ Jurisdictional Waters Western Burrowing Owl (Palen and Blythe only)	BS Biology (Ecology) MS Environmental Management (Wetland and Watershed Management) Ten years' experience in the field of biology and nearly 6 years as a biologist consultant. Regularly conducts habitat assessments and focused surveys for various sensitive fish and wildlife species, including burrowing owl. Additionally, conducts fish and wildlife exclusions and relocation for a number of species including burrowing owl. Strong academic background in aquatic and wetland ecology, as well as watershed level management. Formally trained in federal delineation guidance and procedures. .	X	X	X
Joshua Zinn	AECOM	Aquatic Resources/Jurisdictional Waters	BS Natural Resources MS Environmental Management Fifteen years' experience as an ecologist. Formally trained in the latest federal delineation guidance and procedures (including 2008 Arid West regional supplement delineation manual). Up to date on latest regulatory framework (both State	X	X	X

Name	Affiliation	Surveys Performed	Qualifications	Site		
				Palen	Blythe	Ridge.
			and federal) for jurisdictional waters. Formally trained in CRAM and HGM assessments for riverine wetlands. Up to date on resource agency practice, interpretation, and application with regard to jurisdictional waters.			
Lindsay Teunis	AECOM	Aquatic Resources/Jurisdictional Waters	BS Biology, Marine Emphasis MS Ecology Seven years' experience as a terrestrial and marine ecologist. Formally trained in the latest federal delineation guidance and procedures (including 2008 Arid West regional supplement delineation manual). Up to date on latest regulatory framework (both State and federal) for jurisdictional waters. Formally trained in CRAM and HGM assessments for riverine wetlands.	X	X	X
Andrew Fisher	AECOM	Avian Point Count	BS Wildlife, Fish, and Conservation Biology Has 2.5 years' experience conducting various bird, mammal, and herpetological surveys throughout San Diego County and in Imperial County.	X	X	
Elias Elias	Subconsultant	Avian Point Count, Desert Tortoise	Has worked conducting biological surveys for the past 15 years. His work has included wildlife censusing, including bird point count surveys and mist netting; wildlife tracking; whale surveys, and herpetile		X	X

Name	Affiliation	Surveys Performed	Qualifications	Site		
				Palen	Blythe	Ridge.
			searches.			
H. Lee Jones	Subconsultant	Avian Point Count, Western Burrowing Owl	PhD Biology MA Biology BS Zoology An ornithologist with a Ph.D. in avian biogeography from UCLA. Has been studying birds, with a special emphasis on field identification and distribution, since the age of 8. An independent consulting biologist for the past 16 years in the fields of environmental assessment, natural resource management, and biological research.	X	X	
Jim C. Luttrell	Subconsultant	Avian Point Count, Western Burrowing Owl, Desert Tortoise	MS Environmental Studies BSc Zoology An independent consulting biologist for the past 14 years in the fields of environmental assessment, natural resource management, and biological research. Is working on an ongoing raptor banding study including capture, banding, and recording molt patterns on a variety of hawks and owls. Burrowing owl capture; passive and active relocation projects.	X	X	X

Name	Affiliation	Surveys Performed	Qualifications	Site		
				Palen	Blythe	Ridge.
Andrew Sanders	UCR Herbarium	Botanical	Curator/Museum Scientist of the University of California Herbarium Specializes in the plants of southern California.	X	X	
Bonnie Hendricks-Morgal	AECOM	Botanical	MS Biology, Ecology Emphasis BS Biology, Magna Cum Laude Eighteen years of professional experience as a biologist in the environmental consulting field. Conducted and managed ecological and botanical field studies for numerous projects in Southern California. Has expertise in rare plant and floristic surveys, vegetation classification and mapping, wetland delineation and permitting, restoration and monitoring of vernal pool habitat, wildlife tracking and corridor analysis, and regional conservation planning.	X	X	
Caesara Brungraber (Wendin)	Subconsultant	Botanical	BS Biology BA Economics MS Horticulture Five years' experience as a botanical consultant in Southern California. Ten years in the Pacific coast of the United States from Alaska to California and New England. Conducted rare plant surveys, of federally and state-listed species as well as vegetation mapping, floral inventories, and restoration	X	X	

Name	Affiliation	Surveys Performed	Qualifications	Site		
				Palen	Blythe	Ridge.
			monitoring and design.			
David Silverman	Xeric Specialties Consulting	Botanical	Sixteen years of experience conducting floristic and rare plant surveys, vegetation sampling and mapping on projects throughout the Southwest, for numerous clients and agencies, including 100+ biological survey projects in the desert regions.	X	X	X
Erin Bergman	AECOM	Botanical	MS Biology/Botany BS Biology BS Health and Fitness/Philosophy Over 8 years of experience as a biologist studying and working with rare plants, invasive species, restoration of habitat, and vegetation mapping in Oregon, Washington, Indiana, and Puerto Rico. Three years of experience in Southern California working on restoration plans for State Parks, botanical surveys, rare plant surveys, and wetland surveys. Has been trained to survey rare plants in the Mojave and Colorado deserts, including fall blooming endemics. Published work on rare plants in the tropics and Southern California.	X	X	
Fred Sproul	AECOM	Botanical	BS Biology Thirty years' experience conducting rare plant surveys, and mapping of vegetation including San Diego County unincorporated	X	X	X

Name	Affiliation	Surveys Performed	Qualifications	Site		
				Palen	Blythe	Ridge.
			lands. Regional experience in Riverside, Inyo, and Kern counties and Great Basin.			
Jeanette Duffels	AECOM	Botanical	BA Environmental Studies (Emphasis in Biology) Nine years of experience as a field botanist conducting vegetation mapping, focused rare plant surveys, and habitat assessments throughout Southern California. Extensively surveyed the flora of Los Angeles County and has regional experience in Ventura, Riverside, San Diego, Kern counties and the Great Basin.	X	X	
Kristen Asmus	AECOM	Botanical	BS Plant Science Landscape Horticulture Option MS Botanical Science Eleven years' experience in vegetation mapping and rare plant surveys in Hawaii and California. Including restoration ecology and geographic information system (GIS), with 6 years involving wetland delineations. Certified as an ISA certified arborist [WE-6139A] for 8 years. Regional experience in the Sonoran Desert region, northern California: Alameda, Contra Costa, Santa Clara, San Joaquin, San Benito, Santa Cruz, San Mateo, San Francisco, Marin, Mendocino, Solano, and limited experience in the northern Sierra Nevada.	X	X	

Name	Affiliation	Surveys Performed	Qualifications	Site		
				Palen	Blythe	Ridge.
Kyle Harper	AECOM	Botanical	BS Environmental Systems (Ecology, Behavior, and Evolution) Four years of focused experience as a botanist. Conducted vegetation mapping and focused rare plant surveys throughout coastal and inland southern California. Extensively surveyed the flora of San Diego County and has also been trained to survey for rare plants of the Mojave and Colorado deserts, including fall-blooming endemics. Highly proficient in the use and customization of GIS, Visual Basic, Microsoft Access, and other data management applications.		X	
Lance Woolley	AECOM	Botanical	MA Botany Three years of professional experience as a botanist that includes performing rare plant surveys, vegetation mapping, and habitat assessments throughout Northern and Southern California.	X	X	X
Mark Bibbo	AECOM	Botanical	MS Horticulture and Agronomy BA Environmental Studies Six years of experience in plant community mapping, rare plant surveys, and floristic inventories throughout California.	X	X	
Martus, Carolyn	Subconsultant	Botanical	BS Biology MS Biology	X	X	

Name	Affiliation	Surveys Performed	Qualifications	Site		
				Palen	Blythe	Ridge.
			Nine years' experience in vegetation mapping, rare plant surveys, and invasive plant and animal monitoring projects. Regional experience includes coastal Southern California, Sonoran and Mojave desert floristic communities. She has worked on military instillations and with public utilities.			
Onkar Singh	Garcia and Associates	Botanical	BS Biology Seven years of experience in conducting comprehensive floristic and vegetation studies with extensive familiarity with the California desert floristic province.	X	X	
Richard Dwerlkotte	AECOM	Botanical	BS Environmental Biology and graduate studies Nineteen years' experience as a field botanist and ecologist conducting botanical resource studies on over 100 projects in the western United States and northern Great Plains including rare plant surveys, vegetation mapping, wetland delineation, noxious weed surveys, biological constraints and impacts analyses on a wide variety of projects, assessments of the effects of altered river hydrology on riparian and wetland vegetation.	X	X	X

Name	Affiliation	Surveys Performed	Qualifications	Site		
				Palen	Blythe	Ridge.
Shirley Innecken	AECOM	Botanical	BS Ethnobotanical Ecology Twelve years' experience in the field wildlife and botanical surveys. Conducted rare plant surveys following federal and state standards. Familiar with California floristic communities. Strong organizational skills for fieldwork implementation.	X	X	
Tammie Beyerl	AECOM	Botanical	MS Plant Biology BA Plant Biology Eight years of botanical field experience in California conducting rare plant surveys, wetland delineation, noxious weed surveys, mapping and describing plant communities, performing wetland assessments, and analyzing biological constraints.	X	X	
Ted St. John	AECOM	Botanical	PhD Physiological Plant Ecology Almost 40 years' experience in botany and plant ecology, including internationally recognized research in root growth, soil microbiology, mycorrhizal symbiosis, and other fields directly related to restoration ecology. Devised methods and principles that now figure importantly in the practice of restoration, and has written and spoken widely on mycorrhizal symbiosis and microbial ecology as they figure in restoration.	X	X	

Name	Affiliation	Surveys Performed	Qualifications	Site		
				Palen	Blythe	Ridge.
Joseph Betzler	AECOM	Botanical, Desert Tortoise	BS Botany MS Biology-Botany Diploma Plant Conservation Techniques, Royal Botanic Gardens, Kew, UK Fourteen years' experience in the field of biology. Has experience gathering data for biological assessments and evaluations, inventories, surveys, desert tortoise clearances and surveys (268 hours), and adaptive management plans. Has been a biological consultant for 5 years as a biologist. Specializes in the plants of the southwestern United States floristic provinces.	X	X	X
Andrew Forde	Subconsultant	Desert Tortoise	BS Wildlife Biology Previously authorized by the USFWS to conduct presence/absence surveys for desert tortoise and monitor construction projects. He has conducted desert tortoise surveys in Riverside County, Imperial County and Yuma County (Arizona).	X	X	
Brooks Hart	Subconsultant	Desert Tortoise	BS Biology Over 10 years of experience working as a biologist and 8 years working with desert tortoise.	X	X	X

Name	Affiliation	Surveys Performed	Qualifications	Site		
				Palen	Blythe	Ridge.
Charles German	Subconsultant	Desert Tortoise	BS Over 15 years of experience as a biologist in southern California. Conducted desert tortoise presence/absence surveys in Nevada and California. Previously approved as a desert tortoise handler on various projects.	X	X	X
Donna Germann	AECOM	Desert Tortoise	BS Conservation Biology/Applied Vertebrate Ecology Has 3 years of professional consulting and survey experience conducting biological reconnaissance surveys, vegetation mapping, endangered/threatened species surveys, construction monitoring, and mitigation monitoring. Has conducted and/or accompanied surveys for coastal California gnatcatcher, least Bell's vireo, southwestern willow flycatcher, desert tortoise, fairy shrimp, and many other sensitive species in a variety of California landscapes including desert regions, coastal communities, wetlands, and grasslands.	X	X	
Ed LaRue	Subconsultant	Desert Tortoise	BS Biology MS Entomology Several decades of experience in southern California, highly experienced with desert tortoise surveys. Small mammal trapping experience.		X	

Name	Affiliation	Surveys Performed	Qualifications	Site		
				Palen	Blythe	Ridge.
Ellen Schafhauser	Subconsultant	Desert Tortoise	Bachelor of Professional Science Involved in desert tortoise projects for the past 17 years in California and Arizona.		X	X
Gerald Braden	Subconsultant	Desert Tortoise	BA Environmental Studies and Physical Geography MS Biological Science Over 19 years of experience working as a biologist in Southern California.			X
Gregg Lukasek	Subconsultant	Desert Tortoise	BS Experience in southern California conducting biological surveys including general assessments, and desert tortoise and burrowing owl surveys.	X	X	X
Jacqueline Finck	Subconsultant	Desert Tortoise	BS Biological Sciences Consulting wildlife biologist with 9 years of experience managing, assisting, planning, and conducting a wide diversity of field surveys, biological assessments, and construction monitoring activities involving endangered, threatened, and sensitive animal and plant species throughout California and southern Nevada.	X		
James Huelsman	Subconsultant	Desert Tortoise	BS Conducts presence/absence surveys for	X	X	X

Name	Affiliation	Surveys Performed	Qualifications	Site		
				Palen	Blythe	Ridge.
			desert tortoise, coastal California gnatcatcher, and least Bell's vireo and conducts general biological assessments and focused surveys for a wide variety of special status species throughout Southern California.			
James Jennings	Subconsultant	Desert Tortoise	BS Wildlife biologist with specific endangered or sensitive species survey experience with snowy plover, peregrine falcon, prairie falcon, bald eagle, Swainson's hawk, northern goshawk, burrowing owl, loggerhead shrike, Le Conte's thrasher, sage grouse, bank swallow, yellow warbler, willow flycatcher, California gnatcatcher, least Bell's vireo, San Diego cactus wren, desert bighorn sheep, San Joaquin kit fox, giant kangaroo rat, antelope ground squirrel, desert tortoise, blunt-nosed leopard lizard, western pond turtle, California red-legged frog, San Diego horned lizard, Belding's orange-throated whiptail, and Hoover's woolly-star.	X	X	X
Jonathan "Brent" Vickers	Subconsultant	Desert Tortoise	BA Integrative Biology Conducted desert tortoise surveys in 2008 and 2009 with Peter Woodman of Kiva Biological.		X	

Name	Affiliation	Surveys Performed	Qualifications	Site		
				Palen	Blythe	Ridge.
Kim Fiehler (formerly Duncan)	AECOM	Desert Tortoise	BS Specializes in the biological requirements of rare and endangered species indigenous to Central and Northern California. Knows the survey methodologies for determination of the presence of endangered species.	X	X	X
Michael Anguiano	AECOM	Desert Tortoise	MS Ecology BA Wildlife Biology Three years of environmental consulting experience and 4 years of academic research experience in the field of wildlife biology. While at San Diego State, his research involved investigating the impact of urbanization on California kingsnake spatial ecology and on snake communities in the coastal sage scrub ecosystem. Expertise and experience also includes conservation planning, sensitive habitat assessments, wildlife species surveys, wildlife tracking, data management/analysis, and technical writing.	X	X	
Michael Gallagher	Subconsultant	Desert Tortoise	BA Has conducted clearance surveys, line distance sampling, and presence/absence surveys for desert tortoise since 2004.	X	X	X
Michael Rathbun	Subconsultant	Desert Tortoise	BS Biology	X	X	X

Name	Affiliation	Surveys Performed	Qualifications	Site		
				Palen	Blythe	Ridge.
			Over 11 years of professional experience as a biologist in southern California.			
Milo Rivera	Subconsultant	Desert Tortoise	BS Twelve years of applied and research experience in the field of environmental science, with particular emphasis on wildlife assessments, impact analysis and project management. Has conducted focused threatened and endangered species surveys and sensitive habitat surveys as well as preparing biological reports. Holds a Memorandum of Understanding (MOU) for the desert tortoise. Has conducted and managed surveys for desert tortoise, western burrowing owl, flat-tailed horned lizard, Colorado fringed toed lizard, and nesting bird surveys.	X	X	X
Nicole Stephens	Subconsultant	Desert Tortoise	BA Has worked for 1 year as crew member with Peter Woodman in the Mojave Desert. Has experience recognizing, analyzing, and recording desert tortoise sign and has assisted with desert tortoise health assessments, including the handling of desert tortoises.		X	
Patricia Seamount	Subconsultant	Desert Tortoise	BS Has conducted clearance surveys, line		X	

Name	Affiliation	Surveys Performed	Qualifications	Site		
				Palen	Blythe	Ridge.
			distance sampling, and presence/absence surveys for desert tortoise since 2004.			
Rebecca Koller	Subconsultant	Desert Tortoise	BS Environmental Science Over 8 years of experience conducting desert tortoise surveys.	X	X	
Rob Wolfson	Subconsultant	Desert Tortoise	BS Over 5 years of experience as a biologist and/or an environmental inspector in Nevada and California. Has worked as a desert tortoise biologist or monitor on numerous projects.	X	X	X
Rocky Brown	AECOM Environment	Desert Tortoise	BA Environmental Science Mr. Brown has over 8 years of experience in the environmental consulting field with experience in a wide variety of biological work throughout southern and central California. Experience includes conducting habitat assessments/ constraints analyses; jurisdictional delineations and wetland permitting; habitat restoration/revegetation planning and implementation monitoring; tree and vegetation surveys/mapping; sensitive species surveys, including desert tortoise; and construction monitoring.	X	X	
Russ Smith	AECOM Environment	Desert Tortoise	BS Biology Has 36 years of professional experience as a	X	X	

Name	Affiliation	Surveys Performed	Qualifications	Site		
				Palen	Blythe	Ridge.
			herpetologist.			
Scott Cameron	Subconsultant	Desert Tortoise	BA Over 18 years of biological consulting experience in sensitive biological resources inventories, endangered species surveys, general wildlife biology, environmental mitigation monitoring, and wildlife and botanical habitat evaluations in southern California. Experience with desert tortoise protocol surveys and preconstruction surveys.	X	X	
Shelly Dayman	AECOM	Desert Tortoise	BS Ecology Has 9 years of experience conducting biological surveys; vegetation mapping; construction monitoring; and wildlife surveys for desert tortoise, western burrowing owl, and small mammals in the southwestern United States.	X	X	X
Wayne Vogler	AECOM Environment	Desert Tortoise	BS, Biological Sciences, Concentration in Ecology and Environmental Science Over 15 years' experience working as a biologist and has worked on several large-scale desert tortoise projects.	X	X	
Arthur Davenport	Subconsultant	Desert Tortoise, Botanical	BS Over 20 years' experience in southern California conducting biological surveys	X	X	X

Name	Affiliation	Surveys Performed	Qualifications	Site		
				Palen	Blythe	Ridge.
			including focused rare plant surveys, small mammal trapping, desert tortoise surveys, sensitive bird species surveys, and general biological surveys.			
Katie Hall	AECOM	Desert Tortoise, Burrowing Owl	BA Geography (Environmental Sciences concentration) Over 7 years of multidisciplinary experience serving as environmental scientist, ecologist, research assistant, and assistant manager on various projects. Has conducted surveys for state and federally listed plant and wildlife species. Has experience in performing protocol-level surveys for federally and state-listed threatened and endangered species including desert tortoise, Quino checkerspot butterfly, least Bell's vireo, and arroyo toad.	X	X	X
Andy Hatch	AECOM	Western Burrowing Owl	MS Biological Sciences BS Earth Systems Wildlife biologist with 6 years professional experience in California with special-status wildlife species including mammals, birds, reptiles, amphibians, and invertebrates.			X
Elizabeth Gruenstein	AECOM	Western Burrowing Owl	BS Biology with a concentration in Environmental Has 2.5 years of experience conducting	X	X	

Name	Affiliation	Surveys Performed	Qualifications	Site		
				Palen	Blythe	Ridge.
			wildlife surveys in the San Francisco Bay Area and the southern Sierra Nevada.			
Heather Valentine	AECOM	Western Burrowing Owl	BS Ecology Wildlife biologist with 7 years of experience. Specializes in the implementation of focused wildlife surveys and habitat assessments, primarily for raptors, Passerine birds, and mammals. Extensive experience conducting habitat assessments and protocol surveys for several species, including spotted owl, northern goshawk, willow flycatcher, and American marten.	X		X
Hildie Spautz	AECOM	Western Burrowing Owl	MA Conservation Biology Has 16 years' experience conducting avian surveys, botanical surveys, and vegetation assessments in Northern and Southern California. Two years conducting surveys for herps and mammals in northern California.	X	X	
Josh Meidav	AECOM	Western Burrowing Owl	BA Environmental Studies MS and PhD Restoration Ecology Twelve years of experience as an ecologist/environmental scientist that includes assessment and monitoring of vegetation, wildlife, watershed factors, water quantity and quality, hydrology, geomorphology, and restoration (design and	X	X	

Name	Affiliation	Surveys Performed	Qualifications	Site		
				Palen	Blythe	Ridge.
			monitoring). Locales of projects include sites in Oregon, Nevada, Alaska, and Nicaragua, as well as throughout California.			
Julie Roth	AECOM	Western Burrowing Owl	BS Biology (Neurobiology and Behavior) MS Biology Four years' experience as a field research assistant in eastern California and western Nevada at the University of California, Riverside and University of Nevada, Reno. Seven years' experience conducting protocol-level surveys for small mammals, birds, bats, amphibians and reptiles, including various special status species surveys in northern California.	X	X	X
Mike Ireland	AECOM	Western Burrowing Owl	MA Seven years' professional natural resource survey experience including over 1,500 hours of western burrowing owl experience conducting habitat assessments, CBOC protocol surveys, passive exclusions, and preconstruction surveys in urban riparian corridors, grassland, agricultural and ranch areas, and desert areas throughout the San Francisco Bay area, Central Valley, and in Riverside County, California.	X	X	
Robert Conohan	AECOM	Western Burrowing Owl	BSc Environmental Science Approximately 8 years of professional	X	X	

Name	Affiliation	Surveys Performed	Qualifications	Site		
				Palen	Blythe	Ridge.
			experience working as a field biologist with an expertise in conducting avian, herpetological, and small mammal surveys. Has experience conducting biological investigations in the deserts of San Bernardino, Kern, Imperial and Riverside counties. Has participated in a variety of projects including environmental assessments, environmental impact studies, natural science inventories and habitat assessments for rare and endangered species.			
Sean Avent	AECOM	Western Burrowing Owl	BS Oceanography and Marine Biology Nine years as a biological research assistant at San Francisco State University, and 5 years performing various aquatic invertebrate, fish, mammal, bird, and herpetological surveys throughout California.	X	X	
Steve Henderson	AECOM	Western Burrowing Owl	BS Environmental Biology (Terrestrial Ecology) MS Biological Sciences (Ecology) Wildlife biologist with 15 years' experience designing, conducting, and managing large-scale avian surveys, including protocol surveys and habitat assessments for western burrowing owl and other special status species throughout California. California project experience has focused on biological		X	X

Name	Affiliation	Surveys Performed	Qualifications	Site		
				Palen	Blythe	Ridge.
			inventories and analyses of desert, grassland, forest, woodland, and riparian habitats.			
Vick Germany, AIP	AECOM	Western Burrowing Owl	MA Resource Management and Environmental Planning BA Biology (Ecology and Systematics) Has 22 years of experience as an environmental planner that includes conducting protocol and preconstruction surveys for burrowing owl, California red-legged frog, and California tiger salamander in the San Francisco Bay Area.	X	X	
Wendy Broadhead	AECOM	Western Burrowing Owl	BS Plant Science BA Anthropology BA Art More than 17 years of experience in resource management. Experience in the field of ecology includes plant and wildlife baseline surveys; threatened, endangered, and sensitive species surveys including focused surveys for western burrowing owl.			X
Dana Terry	AECOM	Western Burrowing Owl, Desert Tortoise	BS Zoology BS Ecology & Evolution Five years of experience conducting surveys in California for special-status wildlife species including mammals, birds, reptiles, amphibians, and invertebrates. Regularly	X	X	

Name	Affiliation	Surveys Performed	Qualifications	Site		
				Palen	Blythe	Ridge.
			conducts site assessments and focused surveys for burrowing owls.			
Veronica Wunderlich	AECOM	Western Burrowing Owl, Desert Tortoise	BA Biology (Zoology) MS Biology (Behavior and Physiology) Wildlife biologist with 8 years of experience working with protected aquatic, avian, and terrestrial species in California, including conducting site assessments, and monitoring and protocol-level surveys for special-status species such as California red-legged frog, giant garter snake, California tiger salamander, western burrowing owl, silvery legless lizard, Swainson's hawk, Aleutian Canada goose, sandhill cranes, nesting birds, San Joaquin kit fox, bats, salmonids and other anadromous fishes. Authorized by the U.S. Fish and Wildlife Service 10(a)(1)(A) and California Department of Fish and Game to both survey and collect federally listed California red-legged frog, giant garter snake, and California tiger salamander.	X	X	

ATTACHMENT C

BOTANICAL SURVEY REPORT

BLYTHE SOLAR POWER PROJECT
BOTANICAL SURVEY REPORT
RIVERSIDE COUNTY, CALIFORNIA

Prepared for:

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June 2010

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NOTE TO READER

The following terms will be used throughout this report:

- Project Disturbance Area: This is the proposed BSPP Disturbance Area that includes the entire Proposed Project footprint (fence line including solar fields, transmission facilities, office and maintenance buildings, lay down area, bioremediation area, and leach fields as described in further detail below). It does not include the Colorado River Substation (CRSS), which will be permitted, constructed and operated by Southern California Edison (SCE).
- Proposed Project Study Area: This includes the proposed BSPP Disturbance Area plus additional areas surveyed during 2009 and 2010 for contingency in the engineering design that ultimately will not be disturbed by BSPP, such as the survey area for the CRSS and associated buffers that will be permitted, constructed and operated by SCE.
- Proposed Project BRSA: The Proposed Project BRSA includes the Project Disturbance Area, Proposed Project Study Area, and all associated buffers.
- Reconfigured Alternative Disturbance Area: The Reconfigured Alternative Disturbance Area encompasses the disturbance resulting from the proposed construction of the reconfigured alternative solar power blocks only (which includes the solar fields and components listed in the project description below).
- Reconfigured Alternative BRSA: The Reconfigured Alternative BRSA includes the Reconfigured Alternative Disturbance Area and all associated buffers.
- Combined Survey Area: The Combined Survey Area is the Proposed Project BRSA and the Reconfigured Alternative BRSA. This is all areas surveyed during 2009 and 2010 (the collective total area surveyed to date by AECOM for the BSPP).

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1.0 SUMMARY

Two consecutive years of botanical survey data are now available for the Blythe Solar Power Project (BSPP). In 2009, botanical surveys were conducted for the Proposed Project design and, in 2010, botanical surveys were conducted for a Reconfigured Alternative design, which includes a large area of overlap with the 2009 area surveyed.

The areas surveyed in 2009–2010 consist of eight different plant communities and land cover types. Of these, three vegetation communities and land cover types are considered sensitive by the California Department of Fish and Game (CDFG): creosote bush-big galleta association, desert dry wash woodland, and unvegetated ephemeral dry wash. The overwhelmingly dominant vegetation community on site is Sonoran creosote bush scrub.

Thirty-one special status plant species were identified to have some potential for occurrence within or adjacent to the BSPP Survey Area, one of which is federally listed (Coachella Valley milkvetch [*Astragalus lentiginosus* var. *coachellae*]). Of these, seven were detected within the BSPP Combined Survey Area during spring 2009–2010. No federally listed or state-listed plant species were detected during surveys, but three of the special status species detected are California Native Plant Society (CNPS) List 1B or List 2 and therefore require consideration under the California Environmental Quality Act (CEQA): Harwood's woollystar (*Eriastrum harwoodii*), Harwood's milkvetch (*Astragalus insularis* var. *harwoodii*), and Las Animas colubrina (*Colubrina californica*). The remaining four species are on CNPS List 4 (watch-list), and are recommended for consideration under CEQA, but this consideration may not be required pending agency review: ribbed cryptantha (*Cryptantha costata*), winged cryptantha (*Cryptantha holoptera*), Utah milkvine (*Cynanchum utahense*), and desert unicorn (*Proboscidea althaefolia*).

Rainfall during the 2008–2009 and 2009–2010 winter seasons provided adequate moisture to allow sufficient germination and blooming during the 2009 and 2010 growing seasons, although the Combined Survey Area received more rain during the 2009–2010 season than in 2008–2009 (resulting in increased germination and bloom across the site for the second year of surveys). Special status plant species would have been highly detectable during the field survey period if they were present within the Combined Survey Area. Environmental conditions were favorable for determining the presence of general and special status plant species in both 2009 and 2010.

2.0 INTRODUCTION

For 2 consecutive years, AECOM (formerly EDAW) performed biological resources studies for Palo Verde Solar I, LLC, who is the Applicant for the proposed BSPP (also referred to as

"Project"). The Project is proposed on public lands managed by the Bureau of Land Management (BLM) in Riverside County, California, and the Applicants have submitted an application to BLM for a right-of-way (ROW) grant. The BSPP will be a solar thermal electricity-generating facility using parabolic trough technology with a nominal capacity of 1,000 megawatts (MW).

This Botanical Survey Report (BSR) details the complete results of 2010 botanical surveys conducted for the Proposed Project and Reconfigured Alternative, and incorporates a summary of 2009 survey results where applicable. This BSR does not analyze how the Proposed Project or Reconfigured Alternative will potentially impact threatened, endangered, or special status plants and sensitive vegetation communities documented on site. Impacts analysis will be conducted within the Biological Resources Technical Report.

3.0 PROPOSED PROJECT AND RECONFIGURED ALTERNATIVE DESCRIPTION

The Proposed Project and Reconfigured Alternative would be located in the southern California inland desert, approximately eight miles west of the City of Blythe, the majority of which would be located approximately two miles north of the Interstate 10 (I-10) corridor in Riverside County, California (Figure 1). The Proposed Project and Reconfigured Alternative are proposed on primarily undeveloped open space.

The Proposed Project and Reconfigured Alternative site is nearly completely vacant and undeveloped land is owned the federal government and administered by the BLM. There is a 160-acre private parcel in the center of the Project Disturbance Area that currently is not planned for use by the Proposed Project. Another 160-acre parcel south of the Project Disturbance Area, but within the BRSA, is not planned for use by the Proposed Project. There are no existing structures that would need to be demolished. The site is mostly flat, with elevation ranging on U.S. Geologic Survey (USGS) topographical maps from a high of about 670 feet above sea level at the southwestern limits of the site to a low of about 420 feet above mean sea level near the southeastern site boundary.

During World War II, the site was part of the General George S. Patton Desert Training Center, officially the California-Arizona Maneuver Area (CAMA), a simulated theater of operations. The site area was heavily used by tanks and other military vehicles. Nearby Blythe Airport was used as a CAMA training field. The 46th Bomb Group, and later the 34th Bomb Group, occupied nearby Blythe Airport, then known as Bishop Army Field, and flew training missions in a variety of military aircraft, including bombers.

3.1 Proposed Project

The Applicant is proposing to construct the BSPP, a nominal 1,000-MW commercial solar thermal power-generating facility. The Proposed Project would be located on a 9,405-acre ROW owned by the federal government and administered by the BLM. Use of the federal land would involve issuance of a ROW grant to the Applicant by the BLM. The total Project Disturbance Area would be 7,025 acres (Figure 2). The total Proposed Project Study Area is 7,614 acres (Figure 2). The Proposed Project would use solar parabolic trough technology to generate electricity. With this technology, arrays of parabolic mirrors collect heat energy from the sun and refocus the radiation on a receiver tube located at the focal point of the parabola. A heat transfer fluid (HTF) is heated to high temperature (approximately 750 degrees Fahrenheit [°F]) as it circulates through the receiver tubes. The heated HTF is then piped through a series of heat exchangers where it releases its stored heat to generate high-pressure steam. The steam is then fed to a traditional steam turbine generator where electricity is produced.

The Proposed Project would have a nominal output of 1,000-MW, consisting of four independent 250 MW power plants (Units #1, #2, #3, and #4). The units would be developed in phases, with construction scheduled to begin in late 2010 on the first unit, which would come on line in mid-2013.

Each power block unit would have its own solar field, composed of piping loops arranged in parallel groups, and its own power block, centrally located within the solar field. Each power block would have its own HTF pumping and freeze-protection system, solar steam generator, steam turbine generator, an air-cooled condenser for cooling, transmission lines and related electrical system, and auxiliary equipment (e.g., water treatment system, emergency generators, evaporation ponds). Major project components are identified below.

The BSPP would require a new transmission line. Transmission line features (e.g., crossing structures, pole pads, crane pads, pull sites, splice sites, spur roads, and an access road) would be located along an 8-mile transmission line corridor that extends to a point south of I-10 and then turns west (Figure 2). The transmission line and utility lines share the same corridor except where the transmission line jogs west on the north side of I-10 as show in in Figure 3. The transmission line will be connected to a substation that Southern California Edison (SCE) will be constructing as part of the strengthening and upgrading of its transmission network to support integration of renewable projects. Final placement and development of the substation would be the responsibility of the utility (SCE).

Access to the BSPP would be on a new road heading north from the frontage road along I-10. Only a small portion of the overall facility footprint would be paved, primarily the site access road, the service roads to the power blocks, and six acres of each of the 18 acre power blocks. The solar fields would remain unpaved and without a gravel surface in order to prevent mirror damage. The BSPP solar fields and support facilities perimeter would be secured with chain-link metal-fabric security fencing and controlled access gates.

Major Project Components

The major components and features of the Proposed Project include:

- Solar Field and Power Block Unit #1 (northeast);
- Solar Field and Power Block Unit #2 (northwest);
- Solar Field and Power Block Unit #3 (southwest);
- Solar Field and Power Block Unit #4 (southeast);
- Access road including upgraded portion of Black Rock Road to onsite office;
- Office and parking;
- Land treatment unit (LTU) for bioremediation/land farming of HTF-contaminated soil;
- Warehouse/maintenance building, assembly hall, and laydown area;
- Onsite transmission facilities, including central internal switchyard;
- Natural gas pipeline;
- Telecommunications lines;
- Evaporation ponds;
- Dry wash rerouting; and
- Groundwater wells used for water supply.

Major components of each power block include:

- Steam generation heat exchangers;
- HTF overflow and expansion vessels;
- One auxiliary boiler;
- One steam turbine-generator (STG);
- One generator step up transformer (GSU);
- Air cooled condenser (ACC);
- One wet cooling tower for ancillary equipment;

- Water filter system and clarifier system
- Combination firewater/clarified water tank;
- Potable water system
- Demineralized water system
- Demineralized water tank
- High efficiency reverse osmosis (HERO) waste water recovery system
- Recovered water surge tank
- Evaporation waste stream pond(s)
- Water, natural gas, and HTF pipelines exiting the power block;
- Operations and maintenance buildings; and
- Transmission and telecommunications lines exiting the power block.

The Applicant has made various minor modifications to the BSPP since the AFC was submitted in August 2009. Some of these minor changes are not reflected in the March 2010 Staff Assessment/Draft Environmental Impact Statement (SA/DEIS) and reflect further definition of linear facilities and other changes required as a result of the Applicant's discussions with Staff, other regulatory agencies and the engineering team. New transmission line locations and associated buffers (as part of the Reconfigured Alternative discussed below) as well as additional locations added due to minor Proposed Project changes were surveyed in the spring of 2010 and are the included in the analysis of this report.

Changes to the Proposed Project were submitted to the CEC on April 19, 2010 and include:

- Removal of the four gas-fired HTF heaters (one per Unit);
- Addition of an onsite concrete batch plant during construction (within AFC Disturbance Area);
- Addition of evaporation ponds to process industrial wastewater flows (within AFC Disturbance Area);
- Revision to construction water requirements, number of groundwater wells, and construction water storage approach (within AFC Disturbance Area);
- Finalization of the gen-tie line route to the SCE Colorado River Substation (portion of route outside of AFC Disturbance Area) (Figure 2);
- Clarification on the removal of the existing onsite (abandoned) natural gas pipeline;
- Changes to layout of project facilities (within AFC Disturbance Area);
- Revisions to project drainage system construction sequencing;

- Clarification on the paving of Black Rock Road (roadway section to be improved extends for a total length of approximately 3,500 feet);
- Addition of a temporary construction power line from offsite (outside of AFC Disturbance Area);
- Refinement of the daily construction schedule;
- Finalization of the telecommunications line (within AFC Disturbance Area);
- Revised list of water treatment and hazardous materials chemicals; and
- Addition of an onsite fuel depot (within AFC Disturbance Area).

3.2 Reconfigured Alternative

At the request of the CEC, this report presents findings and analysis for the Reconfigured Alternative that was analyzed in the SA/DEIS. The Reconfigured Alternative would be a 1,000-MW solar facility, similar to the Proposed Project. Three of the proposed solar power blocks (Units 1, 2, and 4) would remain at their proposed locations. These include the two northern solar fields and the southeastern solar field. Unit 3 (the southwestern solar field) would be relocated approximately 0.80 mile south of its proposed location. Approximately 480 acres of the Reconfigured Alternative (a portion of Unit 3) would be outside of the ROW application area, but the alternative would remain entirely within the BLM managed lands.

It is important to note that the Reconfigured Alternative is not a complete engineering design. The Reconfigured Alternative Disturbance Area provides sufficient area for construction of four solar power blocks (and the components outlined above) only. It does not include areas for access roads, staging, office and management facilities, staging area, land treatment unit, dry wash rerouting, water supply, or transmission lines. The Reconfigured Alternative Disturbance Area would be 5,548 acres (Figure 2). The Reconfigured Alternative Disturbance Area encompasses the disturbance caused by construction of the solar power blocks and solar fields only; it does not include shared facilities and linears

Major Reconfigured Alternative Components

The major components and features of the proposed Reconfigured Alternative include:

- Solar Field and Power Block Unit #1 (northeast);
- Solar Field and Power Block Unit #2 (northwest);
- Solar Field and Power Block Unit #3 (southwest); and
- Solar Field and Power Block Unit #4 (southeast).

Most of the Reconfigured Alternative overlaps Proposed Project and was surveyed during 2009. Unsurveyed portions of the Reconfigured Alternative were surveyed in the spring of 2010 and are included in the analysis of this BSR.

4.0 METHODS

AECOM biologists conducted 2010 field assessments and focused botanical surveys beginning in March and continuing through May. Exact dates of surveys and a list of staff are summarized in Table 1.

Table 1
Floral Survey Schedule – 2010

Surveyors[1] \ Dates	March 8–9	March 15–18	March 25–28	March 29–April 2	April 14–15	April 20–21	May 11
Bergman, Erin	X	X		X			
Beyerl, Tammie	X		X	X			
Bibbo, Mark	X	X	X	X			
Duffels, Jeanette		X	X	X	X		
Dwerlkotte, Richard	X		X	X			
Harper, Kyle		X					
Hendricks-Morgal, Bonnie					X		
Sanders, Andrew		X					
Silverman, David			X	X			
Singh, Onkar		X	X				
Sproul, Fred	X	X		X	X	X	
St. John, Ted				X		X	
Woolley, Lance	X	X		X			X

[1] Qualifications for biologists listed in Table 1 can be reviewed in Attachment 2.

4.1 Vegetation Mapping Methods

Vegetation community mapping occurred within portions of the Combined Survey Area that either were not previously surveyed or needed to be re-surveyed using a smaller minimum mapping unit (MMU) (i.e., buffer areas in 2009 that became Disturbance Areas in 2010 required more detailed mapping). Field biologists used orthotopographic maps at a scale of 1 inch equals 700 feet for vegetation mapping. Vegetation communities have been classified according to Holland (1986). Sawyer and Keeler-Wolf (1995) and CDFG (2003) classifications were also used to provide additional detail where appropriate, such as denoting special or sensitive vegetation communities that are either known or believed to be of high priority for inventory in

the California Natural Diversity Database (CNDDB) due to their unique nature, limited distribution (i.e., rarity), or importance for special status wildlife species.

Project botanists consulted with regional experts including Andrew Sanders (of the University of California at Riverside [UCR] Herbarium) and David Silverman (of Xeric Specialties Consulting) to conclude that intuitive controlled surveys per Whiteaker et al. (1998) are sufficient for documenting a complete floral inventory on site (including the target special status plant species). The Whiteaker (1998) method is the BLM-approved method for conducting botanical surveys. Surveyors conducted vegetation mapping within the Proposed Project Study Area and Reconfigured Alternative Disturbance Area by walking meandering transects; transect spacing was dynamic based on habitat complexity and topography, and was close enough to allow visual coverage of vegetation signatures at the minimum mapping unit (MMU) within the Proposed Project Study Area and Reconfigured Alternative Disturbance Area (0.01 acre for riparian areas and 1.0 acre for all other cover types).

Within the buffer areas, the MMU for all land cover types, including riparian, was 1.0 acre. Vegetation mapping within the Proposed Project or Reconfigured Alternative buffer areas was therefore conducted by walking transects within native habitat that were spaced wider than those walked within Disturbance Areas but allowed visual coverage of vegetation signatures 1.0 acre in size or larger. Developed land and agricultural areas were surveyed by a combination of walking transects and selecting key vantage points from existing dirt access roads.

In areas where the aerial imagery was difficult to discern (e.g., the edge of a stabilized dune formation with sandy soils), Global Positioning System (GPS) points were recorded with habitat notes and photos as appropriate to assist with office-based, post-field verification of vegetation polygons delineated in the field.

Dominant plant species present within each riparian and upland vegetation community mapped on site were recorded according to the 50/20 dominance rule (Environmental Laboratory 1987). According to this rule, dominant plant species are defined as those that, when ranked in order of abundance, collectively make up 50 percent relative cover. Each dominant species individually makes up at least 20 percent relative cover or is needed to surpass the 50 percent relative cover threshold. Once the dominant plant species are identified according to this method, they will be grouped according to relative cover: species below 20 percent, species ranging from 20 to 50 percent cover, and species exceeding 50 percent cover.

Vegetation mapping was conducted concurrently with rare plant surveys, so all rare plant observations were accurately delineated using GPS equipment at the time of first observation (refer to rare plant survey methods below for more detail).

Additionally, a description of each vegetation community mapped on site was recorded including the extent of disturbance, presence of special soils, potential jurisdictional waters, and habitat suitability for rare plant species. Invasive species listed by the California Invasive Plant Council (Cal-IPC) as A-1, A-2, and B status species (Cal-IPC 2010) were noted when occurring in high concentrations (approximately 100 square feet and larger) and in nearly monotypic stands. Potential invasive plant species that were expected to be encountered during 2010 surveys on the Project site include tamarisk (*Tamarix* spp.), Saharan mustard (*Brassica tournefortii*), Mediterranean grass (*Schismus* sp.), red brome (*Bromus madritensis*), and cheat grass (*Bromus tectorum*).

Additional Discussion of Sensitive Vegetation Communities

Vegetation communities and other land cover types classified as "sensitive" within this report were determined by applying the following regulatory context. Guidance for determining sensitive vegetation communities is provided by resource agencies including BLM, CDFG, and CNPS, as well as supporting documentation such as the CNDDB. These Federal, state, and local agencies and related publications typically are in concurrence on the classification of sensitive vegetation communities and other land cover types. For example, vegetation communities or other cover types that are coincident with jurisdictional waters will typically be considered sensitive. For the BSPP, these waters are regulated by Sections 1600 et seq. of the California Fish and Game Code. Additionally, the occurrence of suitable habitat for special status plant and animal species also raises the sensitivity of a vegetation community. Biologically, the vegetation communities that provide the highest habitat values within the Combined Survey Area are the riparian communities associated with the desert washes.

4.2 Floral Inventory and Rare Plant Survey Methods

Rare plant surveys occurred within the portions of the Combined Survey Area that either were not previously surveyed, or were necessary to comply with the December 2009 CEC data request for consideration of 15 additional special status plant species and detailed mapping of ribbed cryptantha (*Cryptantha costata*).Botanical surveys were initiated on the BSPP site on March 8, 2010, and continued through May 11, 2010.

Rare plant surveys followed survey guidelines from the following resources: 1) Guidelines for Conducting and Reporting Botanical Inventories for Federally Listed, Proposed, and Candidate Plants (USFWS 2000); 2) Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Natural Communities (CDFG 2009);[1] 3) CNPS Botanical Survey Guidelines (CNPS 2001); and 4) Survey Protocols for Survey and Manage Strategy 2: Vascular Plants (Whiteaker et al. 1998).

Past botanical technical reports and agency letters relevant to the Combined Survey Area were consulted when considering the species with potential to occur on site (CH2MHill 2008; AECOM 2009a and 2009b; USFWS 2009). At the direction of BLM, any varieties of California barrel cactus (*Ferocactus cylindraceus* var. *cylindraceus*), cottontop cactus (*Echinocactus polycephalus* var. *polycephalus*), and hedgehog cactus (*Echinocereus* spp.) encountered on site were also recorded and mapped during rare plant surveys (LaPre 2009). Additionally, the portion of the Combined Survey Area that was previously surveyed in 2009 was revisited systematically to comply with the December 2009 CEC data request for consideration of 15 additional special status plant species and detailed mapping of ribbed cryptantha (*Cryptantha costata*).

Rare plant surveys were "intuitive controlled" (per Whiteaker et al. 1998). The surveys were conducted by walking transects placed systematically throughout the Combined Survey Area while searching for target plant species and suitable habitats. In portions of the Project Disturbance Area and Reconfigured Alternative Disturbance Area not previously surveyed during 2009, botanists traversed all representative habitats, providing complete visual coverage in areas determined to be suitable for target plant species (including microhabitats – small patches of suitable habitat that are smaller than 0.1 acre in size, and are surrounded by unsuitable habitat).). This required closely spaced transects in the desert washes, incised channels, and sandy dune habitats (50–100 feet, possibly less depending on topographic complexity) and allowed wider spacing in the flat creosote bush scrub and desert pavement (approximately 100–200 feet, or more depending on visibility). Transects followed topographic relief rather than predefined survey grids, for the purpose of providing focused coverage of the desert washes.

In the Combined Survey Area buffers, suitable habitats associated with the major desert washes or sandy dune habitats were surveyed with complete visual coverage but the areas were not resurveyed with the same rigor as the Disturbance Areas.

[1] This document replaced the CDFG document entitled "Guidelines for Assessing the Effects of Proposed Projects on Rare, Threatened and Endangered Plants and Natural Communities."

Suitable habitats were determined based on geography, slope aspect, soil substrate, vegetation community, associated plant species, and familiarity with each species based on reference populations and historical surveys conducted in the region. Unsuitable habitats were traversed while traveling between areas of suitable habitat, providing partial survey coverage in these areas. Each field botanist carried a GPS to record their path through the Combined Survey Area each day.

The exception to the "intuitive controlled" method described above would have been with respect to the Coachella Valley milkvetch surveys. This federally endangered plant species must receive more focused attention in areas of suitable habitat where the species has potential to occur, based on USFWS requirements. Project Biologist Andrew Sanders (of the UCR Herbarium) has determined that Coachella Valley milkvetch is not currently documented outside of the Coachella Valley area. To reach this conclusion, Mr. Sanders thoroughly reviewed the vouchered collections (identified as Coachella Valley milkvetch) from the Desert Center area (Dice 980324-2; Dice 980324-3; and Sears 1173) and other collection data (e.g., http://ucjeps.berkeley.edu/consortium/ and UCR herbaria specimens). After careful consideration, Mr. Sanders found the Desert Center collections (i.e., all Coachella Valley milkvetch collections outside the Coachella Valley) to be *Astragalus lentiginosus* var. *variabilis* rather than *A. lentiginosus* var. *coachellae*.

Therefore, focused surveys for Coachella Valley milkvetch were not applicable to the BSPP botanical surveys, and field observations during the 2010 survey season corroborated the findings of Andrew Sanders. A letter from Andrew Sanders is provided as Attachment 3.

The timing of rare plant surveys was based on the most phenologically appropriate time for each target plant species; surveys occurred when reproductive structures (i.e., flowers and fruits) and distinctive leafy parts were present and easily identifiable. When possible, known locations of rare plants in the vicinity of the Project site were visited to verify the status of these species during the 2010 growing season (germinating, flowering, seeding, etc.). When reference site visits were not possible, specimens from the UCR Herbarium were studied to inform field biologists of important keying characters (Attachment 4).

In general, the ideal survey window for spring 2010 was closely associated with the rainfall pattern, considering both rainfall totals and the timing of precipitation. Additional surveys occurred as many times as necessary to ensure the blooming periods of all target rare plant

species were covered.[2] Areas containing rare plants were visited at least twice during the survey season and all observed species were identifiable during these visits. The the substation area was revisited during four separate weeks to ensure the *Cryptantha* and *Eriastrum* were properly identified, as the *Cryptantha* can be difficult to distinguish and the *Eriastrum* species were later to bloom than others within the Combined Survey Area. Areas with desert pavement, high disturbance, and/or little species diversity were only visited once.

During spring rare plant surveys, each field botanist recorded a complete floral inventory, including the phenology(ies) observed (to document the blooming period and calibrate the timing of additional surveys). All plant species observed during the rare plant surveys are provided as Attachment 5.

Plant nomenclature follows that of The Jepson Desert Manual (Baldwin et. al. 2002). Additionally, scientific names are used in all records to avoid confusion between taxa. Time was allotted as necessary to confirm the identity of unknown species to the taxonomic level necessary to determine identification and sensitivity.

If a target rare plant population was located, the population was assessed for vigor and potential existing threats (e.g., off-road vehicle activity and invasive plants) and the number of individuals were counted (or subsampled and population size estimated in the event of large populations). All sensitive plant locations identified were recorded directly with submeter handheld GPS units and were subsequently mapped on aerial photo-based field maps (700-foot scale orthotopographic maps). Rare plant detections are mapped either as individual point locations (for single plants or small clusters of plants) or as occupied polygons (for large, continuous populations of plants).

In addition to mapping special status species occurrences, suitable habitat for the target species was assessed and mapped. In many cases, not enough information is known about microhabitat preferences of a species to define its habitat beyond the level of vegetation communities.

[2] In DR-BIO-81 of the AECOM Response to the CEC Data Request (December 2009), AECOM proposed that biologists would walk 10- to 20-meter parallel transects within all habitats of the disturbance areas, regardless of habitat suitability. After further consideration of the terrain within the Combined Survey Area, this approach was revised; habitat complexity dictated how far each botanist was able to see and therefore dictated the necessary spacing. AECOM botanists have consulted with regional experts including Andrew Sanders and David Silverman to conclude that intuitive controlled surveys per Whiteaker et al. 1998 are sufficient for documenting a complete floral inventory on site (including the target special status plant species). Therefore, this is the BLM-approved method of performing survey transects for all survey areas larger than 1 acre.

Following submittal of this report, CNDDB forms will be completed and submitted to CDFG (as publically available data) for all special status plant species observed. Voucher specimens of special status plant species were collected if it was determined that such collection would not jeopardize the existing population. These collections were submitted to the UCR Herbarium through Andrew Sanders.

4.3 Additional Survey Considerations

During vegetation mapping and rare plant surveys, field botanists were prepared to document any observations of creosote bush rings (none were discovered).

Regional experts were consulted for guidance through all phases of survey work for concurrence with the methods employed by AECOM survey teams. This includes botanists such as David Silverman (of Xeric Specialties Consulting) and Andrew Sanders. These experts received copies of this methodology and provided approval prior to field surveys, and once in the field they trained crews on species identification, conducted expert habitat assessments, and provided guidance on optimal survey timing for the targeted special status plant species.

5.0 RESULTS

This section details the results of 2009 and 2010 field surveys, including the special status plant species, vegetation communities, and other land cover types observed within the Combined Survey Area. Additionally, this section provides a discussion of special status plant species that are not documented but have potential to occur within the Combined Survey Area.

5.1 Vegetation Communities

Eight vegetation communities and other cover types were identified within the Combined Survey Area during 2009–2010 field surveys, including upland, riparian, and other cover types. The acreages of each vegetation community within the Combined Survey Area are provided in Table 2.

Vegetation communities are described in detail below and based on a classification system by R. Holland (1986). When appropriate, vegetation classification by J.O. Sawyer and T. Keeler-Wolf (1995) are also considered. Community types according to CDFG (2003) are listed where applicable. Photographic documentation of vegetation communities is included in Attachment 6.

Table 2
Vegetation Communities and Cover Types within the Combined Survey Area (Acres)

Vegetation Communities and Other Cover Types	Proposed Project BRSA			Reconfigured Alternative BRSA		
	Study Area	Buffer Area	Total[2]	Disturbance Area	Buffer Area	Total[2]
Riparian						
Creosote Bush-Big Galleta Association	403.10	70.54	**473.64**	237.04	220.28	**457.32**
Desert Dry Wash Woodland	220.16	650.52	**870.68**	171.32	594.34	**765.66**
Unvegetated Ephemeral Dry Wash[1]	8.68	2.71	**11.39**	4.96	6.40	**11.36**
Subtotal Riparian[2]	*631.94*	*723.77*	***1,355.71***	*413.32*	*821.02*	***1,234.34***
Upland						
Sonoran Creosote Bush Scrub	6,606.87	12,783.70	**19,390.57**	5,134.66	12,584.71	**17,719.37**
Stabilized and Partially Stabilized Desert Dunes	363.12	2,299.50	**2,662.62**	0	0	**0**
Subtotal Upland[2]	*6,969.99*	*15,083.20*	***22,053.19***	*5,134.66*	*12,584.71*	**17,719.37**
Other Cover Types						
Agricultural Land	6.50	1,059.77	**1,066.27**	0	1,236.57	**1,236.57**
Developed	5.53	84.97	**90.49**	0	22.18	**22.18**
Disturbed	0	26.54	**26.54**	0	0	**0**
Subtotal Other Cover Types[2]	*12.03*	*1,171.28*	***1,183.30***	*0*	*1,258.75*	***1,258.75***
Total Acres[2]	**7,613.96**	**16,978.25**	**24,592.20**	**5,547.98**	**14,664.49**	**20,212.47**

[1] Unvegetated channels are potentially jurisdictional aquatic features and were not mapped within the buffer because these surveys were conducted at a minimum mapping unit of 1.0 acre, as opposed to 0.01 of an acre for riparian vegetation communities within the disturbance area. This approach is consistent with the AECOM Jurisdictional Delineation methodology and is pursuant to Appendix B, Section (g), Subsection (13), Paragraph (B), Clause (iii) of the CEC Siting Regulations, which does not require detailed mapping of aquatic features beyond 250 feet of the disturbance limits (CEC 2007).

[2] All values were rounded to the nearest hundredth-acre after summation.

5.1.1 Riparian Vegetation Communities

Three riparian vegetation communities are present within the Combined Survey Area. These communities are associated with the braided washes traversing much of the site and have not been historically exposed to the same disturbance regime as the flat upland areas. Field observations showed that major washes within the western side of the Combined Survey Area exhibited less refuse and historical signs of military training, agricultural, or other human land

use. Many of the minor washes within the central and eastern portions of the Combined Survey Area do not topographically exclude pedestrians and vehicles, and therefore exhibit similar disturbance levels and land use patterns when compared with the surrounding uplands.

Creosote Bush – Big Galleta Association

The creosote bush – big galleta vegetation community is not distinguished by Holland (1986) but is considered a subcomponent of Sonoran creosote bush scrub under Holland Code 33100. This vegetation type is listed as the Creosote Bush – Big Galleta Association (33.010.13) in the CDFG List of California Terrestrial Natural Communities Recognized by the CNDDB, and is considered a special community on this list (CDFG 2003). Special community types are either known or believed to be of high priority for inventory in the CNDDB (CDFG 2003). This community is considered a relatively rare vegetation community in California deserts and its range has probably decreased in areas with prolonged heavy grazing (Thomas et al. 2004).

Within the Combined Survey Area, the creosote bush – big galleta vegetation community occurs as an understory component in the washes within the dry desert wash woodland and continues along low sandy areas (swales) within the larger Sonoran creosote bush scrub community of the Combined Survey Area. Dominant and indicator plants of this community include creosote bush (*Larrea tridentata*), big galleta grass (*Pleuraphis rigida*), and cheesebush (*Hymenoclea salsola*). Occasional associates found within this community include brownplume wire lettuce (*Stephanomeria pauciflora* var. *pauciflora*), Utah milkvine (*Cynanchum utahense*), Hartweg's twinevine (*Sarcostemma cynanchoides* ssp. *hartwegii*), and trailing townula (*Sarcostemma hirtellum*).

Desert Dry Wash Woodland

Desert dry wash woodland is considered sensitive by the CNDDB (CDFG 2003) and BLM (2002). Desert dry wash woodland is designated by Holland (1986) as Code 62200 and is classified by the CNDDB (CDFG 2003) as the Blue Palo Verde – Ironwood – Smoke Tree Woodland Alliance 61.530.00. Desert dry wash woodland is distributed along the larger drainages of the lower Mojave Desert and more generally through the Colorado Desert. Desert dry wash woodland is typically an open vegetation community; however, canopy development and density are variable and may depend on water supply. It is drought-deciduous, microphyllous riparian thorn scrub woodland that can range between 15 and 60 feet tall, dominated by one or more fabaceous trees (Holland 1986).

This vegetation community occupies the major washes that traverse the Combined Survey Area and is dominated by an open overstory of ironwood (*Olneya tesota*), blue palo verde

(*Parkinsonia florida*), smoketree (*Psorothamnus spinosus*), cheesebush, catclaw (*Acacia gregii*), dye bush (*Psorothamnus emoryi*), and sweetbush (*Bebbia juncea* var. *aspera*). The dry desert wash woodland within the Combined Survey Area also contains a scattered understory of big galleta grass, desert starvine (*Brandegea bigelovii*), and desert lavender (*Hyptis emoryi*) that is intermixed with creosote bush and Russian thistle (*Salsola tragus*). Tamarisk species, which are invasive, are also interspersed throughout this community.

Within the Combined Survey Area, this plant community principally comprises a set of braided washes that drain east from the McCoy Mountains. They originate in steep incised canyons near the western edge of the buffer and dissipate as the slope decreases disposing of their alluvia on level areas near the center of the Combined Survey Area (Table 2) (Figure 3).

Unvegetated Ephemeral Dry Wash

This community consists of unvegetated washes that are dominated by sandy substrate and little to no vegetation. Unvegetated ephemeral dry wash occurs within the transition zone between the desert dry wash woodland, as the washes are transitioning to sheet flow as they drain to the northeast (Table 2) (Figure 3).

There were no dominant plant species observed in association with unvegetated ephemeral dry wash, as these areas are primarily devoid of vegetation.

Within the Combined Survey Area, unvegetated ephemeral dry wash is interspersed throughout the dry desert wash woodland but is often much smaller than the 0.1-acre MMU threshold. Due to the larger 1.0-acre MMU in the buffer areas, corresponding unvegetated ephemeral dry wash was not mapped in the buffer but was included as a component of the desert dry wash woodland. As a relic of several past disturbance area alterations, there is now a small amount of unvegetated ephemeral dry wash mapped within the buffer areas.

5.1.2 Upland Vegetation Communities

Two upland vegetation communities are present within the Combined Survey Area: Sonoran creosote bush scrub and stabilized and partially stabilized desert dunes. Sonoran creosote bush scrub covers an overwhelming percentage of the acreage of the Combined Survey Area.

Past disturbance within the upland vegetation communities of the Combined Survey Area includes military training and agricultural use. These are historical disturbances, and the Sonoran creosote bush scrub within the Combined Study Area has been recovering through natural

recruitment. As a result, two invasive plant species, Russian thistle and Saharan mustard, can be found in disturbed areas throughout the Combined Survey Area, especially near roads and in fallow and active agricultural areas. Another exotic plant, Mediterranean grass, is prevalent throughout the Sonoran creosote bush scrub.

Sonoran Creosote Bush Scrub

Sonoran creosote bush scrub is designated by Holland Code 33100 and by the Sawyer and Keeler-Wolf Ocotillo Series 182. This community is characterized by sandy soils with an underlying shallow clay pan on a broad, gentle southeast-trending slope draining into the Colorado River.

Dominant plants for this community within the Combined Survey Area include creosote bush and burroweed (*Ambrosia dumosa*). Brittlebush (*Encelia farinosa*), cheesebush, and ocotillo (*Fouquieria splendens*) also occur.

This is the most common vegetation community within the Combined Survey Area, dominating the alluvial soil deposits (Table 2) (Figure 3). This plant community intergrades into most of the other plant communities within the Combined Survey Area, including the desert dry wash woodland. Within the Combined Survey Area, there are regions of desert pavement covered with rounded cobbles ranging in diameter from 1 to 3 inches. Typically, these areas are higher than the surrounding landscape by 3 to 15 feet. These areas are included with Sonoran creosote bush scrub, though the plant density is lower and the habitat is more open.

Within the utility corridor on the south side of I-10, fine sand drifts are interspersed within more stabilized areas containing a low percentage of creosote bush (1 to 2 percent cover). To be conservative, much of this interspersed creosote bush was included with the stabilized and partially stabilized desert dunes vegetation community described below.

Stabilized and Partially Stabilized Desert Dunes

Stabilized and partially stabilized desert dunes are designated by Holland as 22200 and by Sawyer and Keeler-Wolf as the Mesquite Series 274. This vegetation community occupies the substation area of the Proposed Project BRSA but does not occur within the Reconfigured Alternative BRSA.

Within the Proposed Project BRSA, this vegetation community does not have a well-developed shrub stratum but does contain more dye bush relative to other areas of the Combined Survey

Area. Dominant plants within this community are primarily herbaceous, including several species of *Cryptantha* (e.g., *C. angustifolia*, *C. maritima*, *C. costata*, *C. holoptera*), two species of Astragalus (*A. aridus* and *A. insularis* var. *harwoodii*), scattered big galleta grass, and sand verbena (*Abronia villosa* var. *villosa*). Many plants from the Sonoran creosote bush scrub are sparsely present within this community as well, and much of the area is invaded by Saharan mustard. Four special status plant species were observed within stabilized and partially stabilized desert dunes, two of which are restricted to this vegetation community (refer to Section 5.3).

5.1.3 Other Cover Types

Three other cover types have been defined for the Combined Survey Area, all of which are attributable to human land use: agricultural land, developed, and disturbed.

Agricultural Land

There is no associated Holland or Sawyer and Keeler-Wolf classification for this land cover type. It includes lands that are currently under cultivation and those that are abandoned (e.g., fallow). In the abandoned agriculture areas, native Sonoran creosote bush scrub plant species are beginning to recover. Russian thistle, Saharan mustard, and other exotic plants were observed interspersed with the native vegetation and are indicative of past agricultural disturbance. All disturbed areas associated with past and present agricultural activities are included under this cover type, which occurs along the eastern border of the Combined Survey Area. (Table 2) (Figure 3).

Developed Areas

Developed areas consist of roadways (I-10, deteriorating asphalt road, and dirt access roads), a large concrete military runway, and cleared land around holdings within the Combined Survey Area (Table 2) (Figure 3).

Disturbed Areas

Disturbed areas are the result of historical or recent ground disturbance such as excavation or off-road vehicle activity. This designation was assigned to unimproved roadsides and a pipeline trench within the Combined Survey Area. These areas are typically linear and small in area (Table 2) (Figure 3).

5.2 Floral Inventory

A total of 168 plant species were detected during 2010 botanical surveys (Attachment 5). Of these, 156 plant species are native to the region. Past agricultural and military uses have influenced the exotic weeds found within the BRSA; as a result, 12 of the plant species detected are nonnative: red brome (*Bromus madritensis* ssp. *rubens*), Bermuda grass (*Cynodon dactylon*), barley (*Hordeum* sp.), Mediterranean grass, brome fescue (*Vulpia bromoides*), prickly lettuce (*Lactuca serriola*), Saharan mustard, London rocket (*Sisymbrium irio*), nettleleaf goosefoot (*Chenopodium murale*), Russian thistle, sour clover (*Melilotus indica*), and tamarisk.

Scanned data sheets from botanical surveys are included as Attachment 7, and a map of survey tracks walked is included as Attachment 8 of this BSR.

Of the native species detected, seven are special status (CNPS Listed and NECO Covered) and two are cactus species targeted at the request of BLM (LaPre 2009). These species are discussed in detail in the following section.

5.3 Special Status Plant Species

Special status plants are native species that are either legally protected under the CESA and/or ESA or other regulations, or species considered by the scientific community to be sufficiently rare to qualify for such listing. CNPS List 1A, 1B, and 2 species are fully considered, as they meet the definitions of Section 1901, Chapter 10 (Native Plant Protection Act) or Sections 2062 and 2067 (CESA) during the preparation of environmental documents relating to CEQA. Many CNPS List 3 and 4 species do not meet the definitions of Section 1901, Chapter 10 (Native Plant Protection Act) or Sections 2062 and 2067 (CESA) but are strongly recommended for consideration under CEQA (CNPS 2001). This BSR fully evaluates plant species meeting any of the above requirements at the request of CEC. Subsequent reports (e.g., AFC, Biological Resources Technical Report) may not consider the CNPS List 3 and 4 species discussed herein.

Forty-one special status plant species were evaluated based on habitat conditions and regional proximity to the Study Area. Of these, 31 species were determined to have potential to occur within the Combined Survey Area based on regional occurrence data and habitat analysis (e.g., a 16-quad CNDDB search including the four U.S. Geological Survey quadrangles occupied by the Combined Survey Area and a surrounding 12-quad buffer, CEC and/or SA/DEIS recommendation) (Table 3) (CDFG 2010).

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Table 3
Special Status Plant Species Potentially Occurring within the Combined Survey Area

Common Name Scientific Name	Sensitivity Status[1]	General Habitat Description (CNPS 2010)	Plant Habit, Flowering Period	Regional Context and Potential for Occurrence within Study Area	Disturbance Area		Buffer	
					Findings[2]	Potential[3]	Findings[2]	Potential[3]
CNPS List 1A, CNPS List 1B and CNPS List 2 Plant Species								
Coachella Valley milkvetch *Astragalus lentiginosus* var. *coachellae*	ESA: Endangered CNPS: List 1B.2 BLM: Sensitive	Sonoran Desert, in sandy areas growing at elevations of 0 to 1,150 feet	Annual or perennial herb that flowers February–May	**Regional Context:** The nearest documented record of this species is 31 miles to the west of the Combined Survey Area, although this has been proven to be a misidentification (Attachment 3). Populations are restricted to the Coachella Valley, approximately 50 miles west of the Combined Survey Area (CDFG 2010). The Combined Survey Area is beyond the known species range for Coachella Valley milkvetch.				
				Proposed Project: Habitat for this species occurs within sandy areas, including the stabilized and partially stabilized desert dunes south of I-10 and the sandy washes in the northeast and western portions of the Proposed Project BRSA.	ND	M	ND	M
				Reconfigured Alternative: Habitat for this species occurs within the sandy washes in the northeast and western portions of the Reconfigured Alternative BRSA.	ND	M	ND	M
chaparral sand verbena *Abronia villosa* var. *aurita*	CNPS: List 1B.1	Chaparral, coastal scrub, and desert dunes, on sandy soils growing at elevations of 260 to 5,250 feet	Annual herb that flowers January–June	**Regional Context:** The nearest documented record of this species is 105 miles to the west of the Combined Survey Area, in Palm Desert (CCH 2010). The Combined Survey Area is east of the known species range for chaparral sand verbena, and although suitable sandy soils are present within the Combined Survey Area the distance from documented locations is quite far to expect this species to occur. This species was identified by the SA/DEIS as having low potential to occur within the Combined Survey Area; while this report maintains that potential of occurrence to remain conservative, it is the opinion of AECOM biologists that this species is not expected to occur within the Combined Survey Area. This species was therefore not considered during crew training and herbaria review. There was one species from the genus *Abronia* observed within the Combined Survey Area during 2009 and 2010 botanical surveys, which was definitively keyed to *A. villosa* var. *villosa*.				
				Proposed Project: Habitat for this species occurs within sandy areas, including the stabilized and partially stabilized desert dunes south of I-10 and the sandy washes in the northeast and western portions of the Proposed Project BRSA.	ND	L	ND	L
				Reconfigured Alternative: Habitat for chaparral sand verbena occurs only south of I-10. This species was not expected to occur and was not detected within the Reconfigured Alternative BRSA during 2009 or 2010 botanical surveys.	ND	NE	ND	NE
angel trumpets *Acleisanthes longiflora*	CNPS: List 2.3 NECO	Dry places, generally on carbonate/limestone derived soils in mountainous areas 30 to 8,000 feet	Prostrate to ascending perennial stems <3 feet; flowers produced during May	**Regional Context:** The closest record of this species is on the Big Maria Mountains, 9 miles southeast of the Combined Survey Area (CDFG 2010). The Combined Survey Area is within the known species range of angel trumpets.				
				Proposed Project: The soils within the Proposed Project BRSA are not appropriate for this species.	ND	NE	ND	NE
				Reconfigured Alternative: The soils within the Reconfigured Alternative BRSA are not appropriate for this species.	ND	NE	ND	NE

Common Name Scientific Name	Sensitivity Status[1]	General Habitat Description (CNPS 2010)	Plant Habit, Flowering Period	Regional Context and Potential for Occurrence within Study Area	Disturbance Area		Buffer	
					Findings[2]	Potential[3]	Findings[2]	Potential[3]
desert sand-parsley *Ammoselinum giganteum*	CNPS: List 2.3	Sonoran desert scrub growing in dry basins at elevations of 1,300 feet (SA/DEIS and California Consortium of Herbaria cite 500 feet elevation [CCH 2010])	Annual herb that flowers March–April	**Regional Context:** Only two documented records of this species exist, 45 miles to the west of the Combined Survey Area, near Hayfields Dry Lake (CCH 2010). Both of these records are from 1922, and the species has not been observed in California since 1922 (even at the 1922 observation sites). The Combined Survey Area is east of the known species range for desert sand-parsley, but is not beyond the possible species range if desert sand-parsley is still extant in California. This species was identified by the SA/DEIS as having low potential to occur within the Combined Study Area; while this report maintains that potential of occurrence to remain conservative, it is the opinion of AECOM biologists that this species is not expected to occur within the Combined Survey Area. There are no dry lake beds within the Combined Survey Area, and there are no known extant populations in California. This species was therefore not considered during crew training and herbaria review. There was no species observed from the family Apiaceae within the Combined Survey Area during 2009 and 2010 botanical surveys.				
				Proposed Project: Habitat for this species does not specifically occur within Proposed Project BRSA, although there is limited information on the habitat preferences of this species. Desert sand-parsley was not detected within the Proposed Project BRSA during 2009 or 2010 botanical surveys.	ND	L	ND	L
				Reconfigured Alternative: Habitat for this species does not specifically occur within Proposed Project BRSA, although there is limited information on the habitat preferences of this species. Desert sand-parsley was not detected within the Reconfigured Alternative BRSA during 2009 or 2010 botanical surveys.	ND	L	ND	L
small-flowered androstephium *Androstephium breviflorum*	CNPS List 2.2	Desert dunes	Perennial from corm, 4 to 12 inches; flowers March–April	**Regional Context:** Two documented occurrences are located approximately 50 miles from the Combined Survey Area, one to the northeast and one to the northwest. The Combined Survey Area is south of the documented species range but is not beyond the possible species range of small-flowered androstephium (CCH 2010).				
				Proposed Project: Habitat for this species occurs on dunes and loose sand within the buffer area.	ND	H	ND	H
				Reconfigured Alternative: Habitat for this species occurs on dunes and loose sand within the buffer area.	ND	H	ND	H
Harwood's milkvetch *Astragalus insularis* var. *harwoodii*	CNPS: List 2.2 NECO	Sonoran Desert, sandy to gravely areas 0 to 1,000 feet	Grayish annual <16 inches; blooms January–May	**Regional Context:** Harwood's milkvetch occurs on site. The range of this species includes concentrations at several points around the southern California deserts. Concentrations are found near Anza Borrego (80 miles SW), Imperial Valley (50 miles SW and 60 miles south), and southern Mojave Desert (60 miles NW). There are also observations about 20 miles to the west of the Combined Survey Area (CCH 2010).				
				Proposed Project: Numerous plants were observed in the transmission line and eastern half of the Proposed Project BRSA, always in stabilized sandy soil (not loose, sandy dunes). Refer to extended habitat discussion in Section 5.3.1.	P	H	P	H
				Reconfigured Alternative: Numerous plants were observed in the eastern half of the Reconfigured Alternative BRSA, always in stabilized sandy soil (not loose, sandy dunes). Refer to extended habitat discussion in Section 5.3.1.	P	H	P	H

Common Name Scientific Name	Sensitivity Status[1]	General Habitat Description (CNPS 2010)	Plant Habit, Flowering Period	Regional Context and Potential for Occurrence within Study Area	Disturbance Area		Buffer	
					Findings[2]	Potential[3]	Findings[2]	Potential[3]
California ayenia *Ayenia compacta*	CNPS List 2.3	Sonoran desert scrub/rocky	Shrub much branched at base, <16 inches; blooms March–April	**Regional Context:** California ayenia is known to occur near Desert Center, about 30 miles west of the Combined Survey Area. The Combined Survey Area is east of the documented species range (which occurs primarily in the western Mojave Desert) but is not beyond the possible species range of California ayenia (CCH 2010).				
				Proposed Project: Habitat for this species may be found in rocky canyons on the western boundary of the buffer zone.	ND	NE	ND	L
				Reconfigured Alternative: Habitat for this species may be found in rocky canyons on the western boundary of the buffer zone.	ND	NE	ND	L
fairyduster *Calliandra eriophylla*	CNPS: List 2.3 NECO	Sonoran Desert, sandy washes, slopes and mesas, typically found at ± 5,000 feet	Shrub <1 foot that blooms March–April	**Regional Context:** The nearest population occurs 16 miles to the west of the Combined Survey Area (CDFG 2010). The Combined Survey Area is not geographically remote from the species range for fairyduster but is below the typical elevation range for this species.				
				Proposed Project: Marginal habitat for fairyduster occurs within the Proposed Project BRSA. Fairyduster was not detected within the Proposed Project BRSA during 2009 or 2010 botanical surveys.	ND	NE	ND	L
				Reconfigured Alternative: Fairyduster is not expected to occur within the Reconfigured Alternative BRSA. Fairyduster was not detected within the Proposed Project BRSA during 2009 or 2010 botanical surveys.	ND	NE	ND	L
alkali mariposa lily *Calochortus striatus*	CNPS: List 1B.2 BLM Sensitive	Western Mojave Desert, alkaline meadows, moist creosote bush scrub found at 2,600 to 4,600 feet	Perennial plant from corm; 2-inch stem has short lived basal leaves up to 8 inches in length; plants bloom April–June	**Regional Context:** The nearest population occurs 135 miles to the northwest of the BRSA (CCH 2010). The Combined Survey Area is both geographically remote from the species range for Alkali mariposa lily and is below the typical elevation range for this species.				
				Proposed Project: Alkali mariposa lily is not expected to occur within the Proposed Project BRSA.	ND	NE	ND	NE
				Reconfigured Alternative: Alkali mariposa lily is not expected to occur within the Reconfigured Alternative BRSA.	ND	NE	ND	NE
sand evening-primrose *Camissonia arenaria*	CNPS: List 2.2	Sonoran desert scrub (sandy or rocky) growing at elevations from -200 feet to 3,000 feet	Annual or perennial herb that flowers November–May	**Regional Context:** The nearest documented occurrence is 16 miles south of the Combined Survey Area (CCH 2010). The Combined Survey Area is slightly north of the known species range, but is not beyond the possible species range for sand evening-primrose. This species was identified by the SA/DEIS as having low potential to occur within the Combined Study Area; after consideration of this species, it is the opinion of AECOM biologists that sand evening-primrose does have a low potential to occur within the Combined Survey Area. This species was not considered during crew training and herbaria review, as it did not appear in the 16-quad search and related study prior to field surveys. There were six species from the genus *Camissonia* observed within the Combined Survey Area during 2009 and 2010 botanical surveys, each of which was definitively keyed to species (or hybrid) other than sand evening-primrose.				
				Proposed Project: Habitat for this species occurs within Proposed Project BRSA. Sand evening-primrose was not detected within the Proposed Project BRSA during 2009 or 2010 botanical surveys.	ND	L	ND	L
				Reconfigured Alternative: Habitat for this species occurs within Proposed Project BRSA. Sand evening-primrose was not detected within the Reconfigured Alternative BRSA during 2009 or 2010 botanical surveys.	ND	L	ND	L

Common Name Scientific Name	Sensitivity Status[1]	General Habitat Description (CNPS 2010)	Plant Habit, Flowering Period	Regional Context and Potential for Occurrence within Study Area	Disturbance Area		Buffer	
					Findings[2]	Potential[3]	Findings[2]	Potential[3]
crucifixion thorn *Castela emoryi*	CNPS: List 2.3 NECO	Desert areas on dry, gravelly washes, slopes, plains found at ±2,150 feet	Shrub <10 feet; blooms April–May	**Regional Context:** The nearest population occurs 20 miles to the northwest of the Combined Survey Area (CDFG 2010). The Combined Survey Area is not geographically remote from the species range for Crucifixion thorn but is below the typical elevation range for this species.				
				Proposed Project: Crucifixion thorn was not detected within the Proposed Project BRSA during 2009 or 2010 botanical surveys.	ND	L	ND	L
				Reconfigured Alternative: Crucifixion thorn was not detected within the Reconfigured Alternative BRSA during 2009 or 2010 botanical surveys.	ND	L	ND	L
Abram's spurge *Chamaesyce abramsiana*	CNPS List 2.2	Sonoran desert scrub (sandy) at elevations from -16 to 3,000 feet	Prostrate annual; blooms September– November	**Regional Context:** The nearest population is 20 miles west near Ford dry lake. The Combined Survey Area is within the known species range of Abram's spurge (CCH 2010).				
				Proposed Project: Habitat for Abram's spurge occurs throughout the Proposed Project BRSA. Results are incomplete pending fall 2010 botanical surveys.	TBD	M	TBD	M
				Reconfigured Alternative: Habitat for Abram's spurge occurs throughout the Reconfigured Alternative BRSA, but results are incomplete pending fall 2010 botanical surveys.	TBD	M	TBD	M
Arizona spurge *Chamaesyce arizonica*	CNPS: List 2.3 BLM Sensitive	Sonoran desert scrub (sandy) growing at elevations from 150 feet to1,000 feet	Perennial herb that flowers March–April	**Regional Context:** The nearest documented occurrence is 90 miles southwest of the Combined Survey Area (CCH 2010). The Combined Survey Area is east of the known species range for Arizona spurge, and although suitable sandy soils are present within the Combined Survey Area the distance from documented locations is quite far to expect this species to occur. This species was identified by the SA/DEIS as having low potential to occur within the Combined Survey Area; while this report maintains that potential of occurrence to remain conservative, it is the opinion of AECOM biologists that this species is not expected to occur within the Combined Survey Area. This species was therefore not considered during crew training and herbaria review. There was one species from the genus *Chamaesyce* observed within the Combined Survey Area during 2009 and 2010 botanical surveys, which was definitively keyed to *C. polycarpa*.				
				Proposed Project: Habitat for this species occurs within Proposed Project BRSA. Arizona spurge was not detected within the Proposed Project BRSA during 2009 or 2010 botanical surveys.	ND	L	ND	L
				Reconfigured Alternative: Habitat for this species occurs within Proposed Project BRSA. Arizona spurge was not detected within the Reconfigured Alternative BRSA during 2009 or 2010 botanical surveys.	ND	L	ND	L
flat-seeded spurge *Chamaesyce platysperma*	CNPS List 1B.2	Desert dunes, Sonoran desert scrub (sandy)	Prostrate annual; blooms May but can also bloom September– November	**Regional Context:** The nearest population is 110 miles west, in Coachella Valley. While suitable habitat is present within the Combined Survey Area, the Combined Survey Area is geographically remote from the species range for flat-seeded spurge (CCH 2010). The CEC specifically requested that flat-seeded spurge be considered during 2010 botanical surveys.				
				Proposed Project: Habitat for flat-seeded spurge occurs throughout the Proposed Project BRSA. Results are incomplete pending fall 2010 botanical surveys.	TBD	L	TBD	L
				Reconfigured Alternative: Habitat for flat-seeded spurge occurs throughout the Reconfigured Alternative BRSA. Results are incomplete pending fall 2010 botanical surveys.	TBD	L	TBD	L

Common Name Scientific Name	Sensitivity Status[1]	General Habitat Description (CNPS 2010)	Plant Habit, Flowering Period	Regional Context and Potential for Occurrence within Study Area	Disturbance Area		Buffer	
					Findings[2]	Potential[3]	Findings[2]	Potential[3]
Las Animas colubrina *Colubrina californica*	CNPS: List 2.3 NECO	Sonoran Desert creosote bush scrub <3,500 feet	Shrubs are generally <3 feet; blooms June–July	**Regional Context:** Las Animas colubrina occurs on site. The Combined Survey Area is within the known species range of Las Animas colubrina (CCH 2010).				
				Proposed Project: Numerous plants were observed in the incised washes in the northwestern portion of the Proposed Project BRSA. Refer to extended habitat discussion in Section 5.3.1.	P	H	P	H
				Reconfigured Alternative: Numerous plants were observed in the incised washes in the northwestern portion of the Reconfigured Alternative BRSA. Refer to extended habitat discussion in Section 5.3.1.	P	H	P	H
glandular ditaxis *Ditaxis claryana*	CNPS List 2.2 NECO	Sonoran Desert at elevations <350 feet; sandy soils in creosote bush scrub	Annual or perennial herb that blooms from December–May	**Regional Context:** There are records of glandular ditaxis 30 miles to the west of the Combined Survey Area (CDFG 2010). The habitat preferences of this species, sandy soils at low elevations, are present within the Combined Survey Area. The Combined Survey Area is south of the documented species range but is not beyond the possible species range of glandular ditaxis (CCH 2010).				
				Proposed Project: Habitat for glandular ditaxis occurs throughout the Proposed Project BRSA. Results are incomplete pending fall 2010 botanical surveys.	TBD	M	TBD	M
				Reconfigured Alternative: Habitat for glandular ditaxis occurs throughout the Reconfigured Alternative BRSA, but results are incomplete pending fall 2010 botanical surveys.	TBD	M	TBD	M
Harwood's woollystar *Eriastrum harwoodii*	CNPS List 1B.2	Desert dunes and loose sand on valley bottoms at <2,975 feet	Annual, 2 to 12 inches; blooms June–July	**Regional Context:** Harwood's woollystar occurs on site. This species is involved in a taxonomic change from *E. sparsiflorum* and is found in only a few scattered locations on the California desert: within and south of the Mojave National Preserve, east of Joshua Tree National Park, and in the Anza-Borrego area (CCH 2010). The Combined Survey Area is within the known species range of Harwood's woollystar. Refer to extended habitat discussion in Section 5.3.1.				
				Proposed Project: Numerous plants were observed in the substation and transmission line portions of the Proposed Project BRSA, in association with the stabilized and partially stabilized desert dunes. Refer to extended habitat discussion in Section 5.3.1.	P	H	P	H
				Reconfigured Alternative: Harwood's woollystar was not detected within the Reconfigured Alternative BRSA during 2009 or 2010 botanical surveys. All observations were located south of I-10; refer to extended habitat discussion in Section 5.3.1.	ND	H	ND	H
pink velvet mallow *Horsfordia alata*	CNPS List 2	Rocky canyons, creosote bush scrub (rocky), washes	Subshrub <16 inches; March–April; November–December	**Regional Context:** Pink velvet mallow is known to occur about 40 miles south of the Combined Survey Area in Imperial County (CDFG 2010). Although the Combined Survey Area is north of the known species range of pink velvet mallow, habitat for this species may be found in rocky canyons on the western boundary of the Combined Survey Area, and the Combined Survey Area is not beyond the possible species range of pink velvet mallow (CCH 2010).				
				Proposed Project: Habitat for pink velvet mallow occurs throughout the western buffer of the Proposed Project BRSA. Results are incomplete pending fall 2010 botanical surveys.	TBD	M	TBD	M
				Reconfigured Alternative: Habitat for pink velvet mallow occurs throughout the western buffer Reconfigured Alternative BRSA, but results are incomplete pending fall 2010 botanical surveys.	TBD	M	TBD	M

Common Name Scientific Name	Sensitivity Status[1]	General Habitat Description (CNPS 2010)	Plant Habit, Flowering Period	Regional Context and Potential for Occurrence within Study Area	Disturbance Area		Buffer	
					Findings[2]	Potential[3]	Findings[2]	Potential[3]
bitter hymenoxys *Hymenoxys odorata*	CNPS List 2.1	Riparian scrub, Sonoran desert scrub (sandy), sandy flats near Colorado River	Annual herb <24 inches; blooms February–May	**Regional Context:** The nearest known populations of bitter hymenoxys are about 20 miles south along the Colorado river. The Combined Survey Area is within the known species range of bitter hymenoxys (CCH 2010).				
				Proposed Project: Bitter hymenoxys was not detected within the Proposed Project BRSA during 2009 or 2010 botanical surveys.	ND	M	ND	M
				Reconfigured Alternative: Bitter hymenoxys was not detected within the Reconfigured Alternative BRSA during 2009 or 2010 botanical surveys.	ND	M	ND	M
California satintail *Imperata brevifolia*	CNPS List 2.1	San Bernardino Mountains, Mojave Desert, in cultivation; found up to 1,700 feet	Perennial grass found near wet springs, meadows, streamsides, and flood plains; flowers September–May	**Regional Context:** The closest records of this species are near the Colorado River, 13 miles east of the Combined Survey Area (CDFG 2010). While the Combined Survey Area is near California satintail populations, the habitat preferences of this species (near wet springs, meadows, streamsides and floodplains) are not present on site.				
				Proposed Project: California satintail was not expected to occur and was not detected within the Proposed Project BRSA during 2009 or 2010 botanical surveys.	ND	NE	ND	NE
				Reconfigured Alternative: California satintail was not expected to occur and was not detected within the Reconfigured Alternative BRSA during 2009 or 2010 botanical surveys.	ND	NE	ND	NE
spearleaf *Matelea parvifolia*	CNPS List 2.3	Sonoran desert scrub (rocky), dry rocky areas 1,430 to 3,560 feet	Twinning perennial shrub; blooms March–May	**Regional Context:** Spearleaf is known to occur south of Desert Center, about 40 miles west of the Combined Survey Area on or near the Bradshaw Trail (CDFG 2010). Rocky canyon habitat marginally suitable for this species may be found in canyons on the western boundary of the buffer zone. Coupling the marginally suitable habitat with the distance to the nearest occurrence, the Combined Survey Area is not beyond the possible species range, but spearleaf is not expected to occur.				
				Proposed Project: Spearleaf was not expected to occur and was not detected within the Proposed Project BRSA during 2009 or 2010 botanical surveys.	ND	NE	ND	NE
				Reconfigured Alternative: Spearleaf was not expected to occur and was not detected within the Reconfigured Alternative BRSA during 2009 or 2010 botanical surveys.	ND	NE	ND	NE
Argus blazing star *Mentzelia puberula (M. oreophila)*	CNPS List 2.2	Washes, limestone soils in desert mountains 2,925 to 5,850 feet	Perennial 6 to 16 inches; blooms May–June	**Regional Context:** Taxonomy remains ambiguous. Closest known populations are about 45 mi northwest in the Coxcomb Mountains and 35 miles southwest in the Chocolate Mountains (CDFG 2010). The Combined Survey Area is within the possible species range for Argus blazing star, but limestone soils and desert mountains are not present on site.				
				Proposed Project: Argus blazing star was not expected to occur and was not detected within the Proposed Project BRSA during 2009 or 2010 botanical surveys.	ND	NE	ND	NE
				Reconfigured Alternative: Argus blazing star was not expected to occur and was not detected within the Reconfigured Alternative BRSA during 2009 or 2010 botanical surveys.	ND	NE	ND	NE

Common Name Scientific Name	Sensitivity Status[1]	General Habitat Description (CNPS 2010)	Plant Habit, Flowering Period	Regional Context and Potential for Occurrence within Study Area	Disturbance Area		Buffer	
					Findings[2]	Potential[3]	Findings[2]	Potential[3]
slender woolly-heads *Nemacaulis denudata* var. *gracilis*	CNPS: List 2.2	Coastal dunes, desert dunes, and Sonoran desert scrub growing at elevations from -160 feet to 1,400 feet	Annual herb that flowers April–May	**Regional Context:** The nearest documented occurrence is 45 miles northeast of the Combined Survey Area (CCH 2010). The Combined Survey Area is within the known species range for slender woolly-heads. This species was identified by the SA/DEIS as having low potential to occur within the Combined Survey Area; after consideration of this species, it is the opinion of AECOM biologists that slender woolly-heads does have a low potential to occur within the Combined Survey Area. This species was not considered during crew training and herbaria review, as it did not appear in the 16-quad search and related study prior to field surveys. There was no species observed from the genus *Nemacaulis* within the Combined Survey Area during 2009 and 2010 botanical surveys.				
				Proposed Project: Habitat for this species occurs within Proposed Project BRSA. Slender woolly-heads was not detected within the Proposed Project BRSA during 2009 or 2010 botanical surveys.	ND	L	ND	L
				Reconfigured Alternative: Habitat for this species occurs within Proposed Project BRSA. Slender woolly-heads was not detected within the Reconfigured Alternative BRSA during 2009 or 2010 botanical surveys.	ND	L	ND	L
lobed ground cherry *Physalis lobata*	CNPS List 2.3	Mojave desert scrub (decomposed granitic) 1,625-2,600 feet	Perennial <20 inches; blooms September–January	**Regional Context:** The closest known populations are over 60 miles to the north (CCH 2010). Suitable habitat is not present within the Combined Survey Area, and the Combined Survey Area is south of the known species range for lobed ground cherry.				
				Proposed Project: Lobed ground cherry was not expected to occur and was not detected within the Proposed Project BRSA during 2009 or 2010 botanical surveys.	ND	NE	ND	NE
				Reconfigured Alternative: Lobed ground cherry was not expected to occur and was not detected within the Reconfigured Alternative BRSA during 2009 or 2010 botanical surveys.	ND	NE	ND	NE
Orocopia sage *Salvia greatae*	CNPS List 1B.3 NECO	Southwestern Sonoran Desert (Orocopia, Chocolate Mountains) on alluvial slopes between 100 and 800 feet	Shrubs are <3 feet with blooms from March–April	**Regional Context:** This species has been recorded in the mountains 30 miles to the west of the Combined Survey Area at an elevation of approximately 2,000 feet (CDFG 2010). Habitat for this species is present within the western portion of the BRSA. The Combined Survey Area is east of the known species range but is not beyond the possible species range of Orocopia sage (CCH 2010).				
				Proposed Project: Orocopia sage was not detected within the Proposed Project BRSA during 2009 or 2010 botanical surveys.	ND	M	ND	M
				Reconfigured Alternative: Orocopia sage was not detected within the Reconfigured Alternative BRSA during 2009 or 2010 botanical surveys.	ND	M	ND	M
desert spikemoss *Selaginella eremophila*	CNPS List 2.2	Eastern Peninsular Ranges to the Sonoran Desert at elevations <3,000 feet; shaded sites among rocks, in crevices, and in gravelly soils	Dense mat forming nonflowering plant	**Regional Context:** This species has been recorded 50 miles to the west (CCH 2010). Marginal habitat for this species is present on the Combined Survey Area as shaded sites on gravel soils, in crevices, and among rocks. The Combined Survey Area is east of the known species range but is not beyond the possible species range for desert spikemoss.				
				Proposed Project: Desert spikemoss was not detected within the Proposed Project BRSA during 2009 or 2010 botanical surveys.	ND	L	ND	L
				Reconfigured Alternative: Desert spikemoss was not detected within the Reconfigured Alternative BRSA during 2009 or 2010 botanical surveys.	ND	L	ND	L

Common Name Scientific Name	Sensitivity Status[1]	General Habitat Description (CNPS 2010)	Plant Habit, Flowering Period	Regional Context and Potential for Occurrence within Study Area	Disturbance Area		Buffer	
					Findings[2]	Potential[3]	Findings[2]	Potential[3]
Coves' cassia *Senna covesii*	CNPS List 2.2 NECO	Dry, sandy desert washes, slopes of the Sonoran Desert between 1,600 and 2,000 feet	Small perennial shrub to 2 feet tall; blooms in April	**Regional Context:** This species has been recorded in the Chuckwalla Mountains at higher elevations than the Combined Survey Area, 32 miles to the west (CCH 2010). The Combined Survey Area is within the known species range for Coves' cassia. Elevations may be too low for sandy wash habitat on site to be suitable.				
				Proposed Project: Coves' cassia was not detected within the Proposed Project BRSA during 2009 or 2010 botanical surveys.	ND	L	ND	L
				Reconfigured Alternative: Coves' cassia was not detected within the Reconfigured Alternative BRSA during 2009 or 2010 botanical surveys.	ND	L	ND	L
mesquite nest straw *Stylocline sonorensis*	CNPS: List 1A NECO	Sonoran desert scrub (sandy) growing at elevations of 1,400 feet	Annual herb that flowers April	**Regional Context:** Only two documented records of this species exist, 45 miles to the west of the Combined Survey Area, near Hayfields Dry Lake (CCH 2010). Both of these records are from 1930, and the species is presumed extinct in California (all known occurrences extirpated). The Combined Survey Area is east of the known species range for mesquite nest straw, but is not beyond the possible species range if mesquite nest straw is still extant in California. This species was identified by the SA/DEIS as having low potential to occur within the Combined Study Area; while this report maintains that potential of occurrence to remain conservative, it is the opinion of AECOM biologists that this species is not expected to occur within the Combined Survey Area. There are no known extant populations in California. This species was therefore not considered during crew training and herbaria review. There was one species from the genus *Stylocline* observed within the Combined Survey Area during 2009 and 2010 botanical surveys, which was definitively keyed to *C. gnaphaloides*.				
				Proposed Project: Habitat for this species does occur within Proposed Project BRSA, however this species is presumed extinct. Mesquite nest-straw was not detected within the Proposed Project BRSA during 2009 or 2010 botanical surveys.	ND	L	ND	L
				Reconfigured Alternative: Habitat for this species does occur within Proposed Project BRSA, however this species is presumed extinct. Mesquite nest-straw was not detected within the Reconfigured Alternative BRSA during 2009 or 2010 botanical surveys.	ND	L	ND	L
dwarf germander *Teucrium cubense* ssp. *depressum*	CNPS List 2.2	Sandy soils, washes, and fields in the Sonoran Desert below 1,200 feet	Annual plants up to 6 inches tall; blooms March–May	**Regional Context:** The closest records for this species are 8 miles east of the Combined Survey Area (CDFG 2010). The Combined Survey Area is within the known species range of dwarf germander, and suitable habitat is present within the Combined Survey Area.				
				Proposed Project: Dwarf germander was not detected within the Proposed Project BRSA during 2009 or 2010 botanical surveys.	ND	H	ND	H
				Reconfigured Alternative: Dwarf germander was not detected within the Reconfigured Alternative BRSA during 2009 or 2010 botanical surveys.	ND	H	ND	H

Common Name Scientific Name	Sensitivity Status[1]	General Habitat Description (CNPS 2010)	Plant Habit, Flowering Period	Regional Context and Potential for Occurrence within Study Area	Disturbance Area		Buffer	
					Findings[2]	Potential[3]	Findings[2]	Potential[3]
jackass clover *Wislizenia refracta* ssp. *refracta*	CNPS List 2.2 NECO	Sandy washes, roadsides, alkaline flats in the Mojave Desert, and northern Sonoran Desert between 1,600 and 2,000 feet	Annual herb; blooms April–November	**Regional Context:** The nearest occurrence is adjacent to Palen Dry Lake, 27 miles west of the Combined Survey Area (CDFG 2010). While the Combined Survey Area is not beyond the possible species range for Jackass clover, habitat for this species within the Combined Survey Area is not as alkaline as in places where it is recorded.				
				Proposed Project: Jackass clover was not detected within the Proposed Project BRSA during 2009 or 2010 botanical surveys.	ND	L	ND	L
				Reconfigured Alternative: Jackass clover was not detected within the Reconfigured Alternative BRSA during 2009 or 2010 botanical surveys.	ND	L	ND	L
Orcutt's woody-aster *Xylorhiza orcuttii*	CNPS List 1B.2 BLM Sensitive	Arid canyons between 60 and 1,000 feet	Shrub <5 feet; blooms March–April	**Regional Context:** One plant recorded north of the San Diego/Imperial County border in Indio (Riverside County). All records are located 80 miles west of the Combined Survey Area (CDFG 2010). Based on the current information, the Combined Survey Area is not within the possible species range of Orcutt's woody aster.				
				Proposed Project: Orcutt's woody-aster was not expected to occur and was not detected within the Proposed Project BRSA during 2009 or 2010 botanical surveys.	ND	NE	ND	NE
				Reconfigured Alternative: Orcutt's woody-aster was not expected to occur and was not detected within the Reconfigured Alternative BRSA during 2009 or 2010 botanical surveys.	ND	NE	ND	NE
CNPS List 3, CNPS List 4, and Taxonomically Unresolved Plant Species								
ribbed cryptantha *Cryptantha costata*	CNPS List 4.3	Desert dunes, quite specific to loose drifting sand <1,625 feet	Annual 10 to 20 centimeters; branched and bristly; blooms February–May	**Regional Context:** Ribbed cryptantha occurs on site. The range of this species is desert areas of San Bernardino, Riverside, and Imperial Counties, with limited outliers as far north as Inyo County over 150 miles to the north. The Combined Survey Area is within the known species range of ribbed cryptantha (CCH 2010).				
				Proposed Project: This species was observed in abundance within the substation and transmission line portions of the Proposed Project BRSA, in association with the stabilized and partially stabilized desert dunes. Refer to extended habitat discussion in Section 5.3.1.	P	H	P	H
				Reconfigured Alternative: Ribbed cryptantha was not detected within the Reconfigured Alternative BRSA during 2009 or 2010 botanical surveys. All observations were located south of I-10; refer to extended habitat discussion in Section 5.3.1.	ND	H	ND	H

Common Name Scientific Name	Sensitivity Status[1]	General Habitat Description (CNPS 2010)	Plant Habit, Flowering Period	Regional Context and Potential for Occurrence within Study Area	Disturbance Area		Buffer	
					Findings[2]	Potential[3]	Findings[2]	Potential[3]
winged cryptantha *Cryptantha holoptera*	CNPS List 4.3	Sonoran desert scrub, primarily on rocky slopes <5500 feet	Annual 10 to 50 centimeters; branched and bristly; blooms March–April	**Regional Context:** Winged cryptantha occurs on site. The range of this species is mostly the California desert areas of San Bernardino, Riverside, and Imperial counties, east of a north-south line between Baker and the mountains west of El Centro. There are small outlying populations in Los Angeles and Inyo counties. The Combined Survey Area is within the known species range of winged cryptantha (CCH 2010).				
				Proposed Project: This species was found on an incised rocky wash bank on old alluvium, at the eastern foot of the McCoy Mountains within the western side of the Proposed Project buffer. A single winged cryptantha individual was identified south of I-10 within the substation buffer.	ND	H	P	H
				Reconfigured Alternative: This species was found on an incised rocky wash bank on old alluvium, at the eastern foot of the McCoy Mountains within the western side of the Reconfigured Alternative buffer.	ND	H	P	H
Wiggins' cholla *Cylindropuntia wigginsii* (syn: *Opuntia wigginsii*)	CNPS: List 3.3 NECO	Sonoran desert scrub (sandy) growing at elevations from 100 feet to 2,900 feet	Perennial stem succulent that flowers March	**Regional Context:** The nearest documented occurrence is 10 miles south of the Combined Survey Area (CCH 2010). This species is a taxonomically unresolved, sporadic hybrid of *Cylindropuntia* (*Opuntia*) *ramosissima* and *Cylindropuntia* (*Opuntia*) *echinocarpa* (CNPS 2010). This species was identified by the SA/DEIS as not expected to occur within the Combined Survey Area; AECOM concurs with this assessment. Both *O. ramosissima* and *O. echinocarpa* were observed within the Combined Survey Area during 2009 and 2010 botanical surveys, but no hybrids were detected.				
				Proposed Project: Wiggin's cholla was not expected to occur and was not detected within the Proposed Project BRSA during 2009 or 2010 botanical surveys.	ND	NE	ND	NE
				Reconfigured Alternative: Wiggin's cholla was not expected to occur and was not detected within the Reconfigured Alternative BRSA during 2009 or 2010 botanical surveys.	ND	NE	ND	NE
Utah milkvine *Cynanchum utahense*	CNPS List 4.3 NECO	Mojave or Sonoran Desert, dry sandy or gravely areas <3,280 feet	Perennial vine growing on shrubs for support; blooms April–June	**Regional Context:** Utah milkvine occurs on site. Within California, this species is concentrated in the southern Mojave Desert, primarily within and near the Twenty-nine Palms Marine Corps base. The Blythe population is one of several smaller outlying populations; others are near I-15 at the Nevada state line, in Mojave National Preserve, and near Anza Borrego. The Combined Survey Area is within the known species range of Utah milkvine (CCH 2010).				
				Proposed Project: This species was found in several areas within the Proposed Project BRSA, including the base of the McCoy Mountains, the braided washes north of I-10, and in McCoy Wash.	P	H	P	H
				Reconfigured Alternative: This species was found in several areas within the Reconfigured Alternative BRSA, including the base of the McCoy Mountains, the braided washes north of I-10, and in McCoy Wash.	P	H	P	H

Common Name Scientific Name	Sensitivity Status[1]	General Habitat Description (CNPS 2010)	Plant Habit, Flowering Period	Regional Context and Potential for Occurrence within Study Area	Disturbance Area		Buffer	
					Findings[2]	Potential[3]	Findings[2]	Potential[3]
snakewood *Condalia globosa* var. *pubescens*	CNPS List 4.2	Sonoran desert scrub < 3,250 feet.	Thorn-tipped shrub <4 meters; blooms March–April	**Regional Context:** The closest population is in Imperial County about 15 miles south of the Combined Survey Area (CCH 2010). The Combined Survey Area is within the known species range for snakewood. Suitable habitat is poorly defined for this species; to remain conservative, the Combined Survey Area must be assumed to contain suitable habitat.				
				Proposed Project: Snakewood was not detected within the Proposed Project BRSA during 2009 or 2010 botanical surveys.	ND	M	ND	M
				Reconfigured Alternative: Snakewood was not detected within the Reconfigured Alternative BRSA during 2009 or 2010 botanical surveys.	ND	M	ND	M
foxtail cactus *Corypantha alversonii*	CNPS List 4.3 NECO	Sonoran and Mojave desert scrub (creosote bush series) growing in rocky soils on hills, mountains, and bajadas between 250 and 2,000 feet	One to many spheric or cylindric stems growing up to 1 foot in height; blooms May–June	**Regional Context:** The closest record of this species is in the Big Maria Mountains, 9 miles northeast of the Combined Survey Area (CDFG 2010). The Combined Survey Area is within the known species range of foxtail cactus. All records are associated with mountainous areas, though soil requirements are similar to the Combined Survey Area.				
				Proposed Project: Foxtail cactus was not expected to occur and was not detected within the Proposed Project BRSA during 2009 or 2010 botanical surveys.	ND	NE	ND	NE
				Reconfigured Alternative: Foxtail cactus was not expected to occur and was not detected within the Reconfigured Alternative BRSA during 2009 or 2010 botanical surveys.	ND	NE	ND	NE
California ditaxis *Ditaxis serrata* var. *californica*	CNPS List 3.2 NECO	Mojave Desert and northwest Sonoran Desert (Coachella Valley) 150 to 3,300 feet	Annual or perennial herb that blooms from March–May and October–December	**Regional Context:** There are records of California ditaxis 34 miles to the west of the Combined Survey Area (CDFG 2010). The habitat preferences of this species, sandy soils in washes and canyons, are present within the Combined Survey Area. The Combined Survey Area is south of the documented species range but is not beyond the possible species range of California ditaxis (CCH 2010).				
				Proposed Project: California ditaxis was not detected within the Proposed Project BRSA during 2009 or 2010 botanical surveys.	ND	M	ND	M
				Reconfigured Alternative: California ditaxis was not detected within the Reconfigured Alternative BRSA during 2009 or 2010 botanical surveys.	ND	M	ND	M
desert portulaca *Portulaca halimoides*	CNPS List 4.2	Joshua tree woodland (sandy); 3,250 to 3,900 feet	Annual; spreading to ascending; 0.5 to 2.5 inches; germinates after summer rains	**Regional Context:** Nearest populations are in western Joshua Tree National Park, 85 miles west of the Combined Survey Area (CDFG 2010). The Combined Survey Area is southeast of the known species range of desert portulaca but is within the possible species range. However, suitable habitat (elevation and vegetation) is not found within the Combined Survey Area.				
				Proposed Project: Desert portulaca was not expected to occur and was not detected within the Proposed Project BRSA during 2009 or 2010 botanical surveys.	ND	NE	ND	NE
				Reconfigured Alternative: Desert portulaca was not expected to occur and was not detected within the Reconfigured Alternative BRSA during 2009 or 2010 botanical surveys.	ND	NE	ND	NE

Common Name Scientific Name	Sensitivity Status[1]	General Habitat Description (CNPS 2010)	Plant Habit, Flowering Period	Regional Context and Potential for Occurrence within Study Area	Disturbance Area		Buffer	
					Findings[2]	Potential[3]	Findings[2]	Potential[3]
desert unicorn *Proboscidea althaeifolia*	CNPS List 4.3 NECO	Generally occurs throughout sandy portions of the Sonoran Desert; <3,250 feet	Perennial from tuber-like root; blooms in summer	**Regional Context:** Desert unicorn occurs on site. Within California, this species is found in extreme eastern deserts in San Bernardino, Riverside, and Imperial counties. There are outlying populations in the Anza-Borrego area and the Banning Pass near Cabazon. The Combined Survey Area is within the known species range of desert unicorn (CCH 2010).				
				Proposed Project: This species was found in small numbers throughout the center of the Proposed Project BRSA.	P	H	P	H
				Reconfigured Alternative: This species was found in small numbers throughout the center of the Reconfigured Alternative BRSA.	P	H	P	H
Palmer's jackass clover *Wislizenia refracta* ssp. *palmeri*	No listing status, proposed new addition to the CNPS inventory (per SA/DEIS)	Sandy washes, roadsides, alkaline flats in the Mojave Desert, and northern Sonoran Desert between 0 and 656 feet (CalFlora 2010)	Annual herb; blooming period undocumented (assumed	**Regional Context:** This species is not yet listed with a special status. The nearest occurrence is 20 miles west of the Combined Survey Area (CCH 2010). While the Combined Survey Area is not beyond the possible species range for Jackass clover, habitat for this species within the Combined Survey Area is not as alkaline as in places where it is recorded. This species was identified by the SA/DEIS as having low potential to occur within the Combined Survey Area; after consideration of this species, it is the opinion of AECOM biologists that Palmer's jackass clover does have a low potential to occur within the Combined Survey Area. This species was not considered during crew training and herbaria review, as it did not appear in the 16-quad search and related study prior to field surveys. There was no species observed from the genus *Wislizenia* within the Combined Survey Area during 2009 and 2010 botanical surveys.				
				Proposed Project: Palmer's jackass clover was not detected within the Proposed Project BRSA during 2009 or 2010 botanical surveys.	ND	L	ND	L
				Reconfigured Alternative: Palmer's jackass clover was not detected within the Reconfigured Alternative BRSA during 2009 or 2010 botanical surveys.	ND	L	ND	L
Additional Plant Species for Consideration at the Request of BLM (LaPre 2009)								
cottontop cactus *Echinocactus polycephalus* var. *polycephalus*	No special status (considered but rejected)	Rocky hills, silty valleys <3,250 feet	Clumps <2 feet; blooms March–May	**Regional Context:** Cottontop cactus occurs on site. The Combined Survey Area is within the known species range of cottontop cactus (CCH 2010).				
				Proposed Project: This species was found in small numbers throughout the Proposed Project BRSA but was primarily observed beyond the southwestern buffer at the base of the McCoy Mountains.	P	M	P	H
				Reconfigured Alternative: This species was found in small numbers throughout the Reconfigured Alternative BRSA but was primarily observed within the southwestern buffer at the base of the McCoy Mountains.	P	M	P	H

Common Name Scientific Name	Sensitivity Status[1]	General Habitat Description (CNPS 2010)	Plant Habit, Flowering Period	Regional Context and Potential for Occurrence within Study Area	Disturbance Area		Buffer	
					Findings[2]	Potential[3]	Findings[2]	Potential[3]
hedgehog cactus *Echinocereus engelmannii*	No special status	Many dry habitats	Clumps or mounds <3 feet diameter; stems <2 feet; blooms May–June	**Regional Context:** The nearest occurrence of this species is 14 miles south of the Combined Survey Area. The Combined Survey Area is within the known species range of hedgehog cactus (CCH 2010).				
				Proposed Project: Hedgehog cactus was not detected within the Proposed Project BRSA during 2009 or 2010 botanical surveys.	ND	H	ND	H
				Reconfigured Alternative: Hedgehog cactus was not detected within the Reconfigured Alternative BRSA during 2009 or 2010 botanical surveys.	ND	H	ND	H
hedgehog cactus *Echinocereus triglochidiatus*	No special status	Many habitats; Elevation 490 to 9800 feet	Dense mounds <16 inches; blooms April–June	**Regional Context:** The nearest occurrence of this species is 83 miles northwest of the Combined Survey Area. The Combined Survey Area is southeast of the known species range of hedgehog cactus (specifically, *E. triglochidiatus*), but the Combined Survey Area is not beyond the possible species range of hedgehog cactus (CCH 2010).				
				Proposed Project: Hedgehog cactus was not detected within the Proposed Project BRSA during 2009 or 2010 botanical surveys.	ND	M	ND	M
				Reconfigured Alternative: Hedgehog cactus was not detected within the Reconfigured Alternative BRSA during 2009 or 2010 botanical surveys.	ND	M	ND	M
California barrel cactus *Ferocactus cylindraceus*	No special status	Gravelly, rocky, or sandy areas	Single-stemmed perennial cactus <6 feet; blooms April–May	**Regional Context:** California barrel cactus occurs on site. The Combined Survey Area is within the known species range of California barrel cactus (CCH 2010).				
				Proposed Project: California barrel cactus was observed throughout the northern half of the Proposed Project BRSA.	P	M	P	H
				Reconfigured Alternative: California barrel cactus was observed throughout the northern half of the Reconfigured Alternative BRSA.	P	M	P	H

[1] **Sensitivity Status Key**

ESA Federal Endangered Species Act (ESA) Threatened

CNPS California Native Plant Society Lists:

1B: Considered rare, threatened, or endangered in California and elsewhere

2: Plants rare, threatened, or endangered in California, but more common elsewhere

3: Plants for which we need more information – review list

4: Plants of limited distribution a watch list

Decimal notations: .1 - Seriously endangered in California, .2 – Fairly endangered in California, .3 – Not very endangered in California

BLM Special Status Plants (Palm Springs Field Office)

NECO Northern and Eastern Colorado Desert Coordinated Management Plan special status species

[2] **Findings**

P (present) – Species detected during Project surveys

ND (not detected) – Species not detected during Project surveys

TBD – To be determined. This term is used for species that require fall surveys to be detected. However, additional fall surveys may not be necessary because mitigation and/or land acquisition for DT will include habitat for these TBD non-listed special status plant species that may or may not be within the Project Disturbance Area or Reconfigured Alternative Disturbance Area.

[3] **Potential**

NE (not expected) – Suitable habitat for species does not occur

L (low potential) – Suitable habitat present, but of marginal quality

M (moderate potential) – Suitable habitat present

H (high potential) – Suitable habitat present, and species known to occur within the vicinity

During 2009 and 2010 botanical surveys, seven of the 31 special status plant species with potential to occur were detected within the Combined Survey Area (Tables 4 and 5) (Figure 4). Each of these species is covered under NECO and/or listed by CNPS, but none are federally or state listed. The location and habitats in which these plants were observed are discussed in more detail below in Section 5.3.1. No federally listed or state-listed plant species were observed within the Combined Survey Area. Prior to the 2009–2010 surveys conducted by AECOM, no special status plant species were documented as occurring within or in the immediate vicinity (i.e., within 1 mile) of the Combined Survey Area.

Table 4
Occurrence Detail for Special Status Plant Species Documented within the Proposed Project BRSA

Species Common Name	Proposed Project BRSA (Number of Occurrences [Plant Count]								
	Study Area			Buffer Area			Total		
	2009	2010	*Subtotal*	2009	2010	*Subtotal*	2009 Total	2010 Total	**GRAND TOTAL**
CNPS List 1B and CNPS List 2 Plant Species									
Harwood's milkvetch	0 (0)	103 (847)	*103* *(847)*	2 (3)	191 (2,457)	*189* *(2,281)*	2 (3)	294 (3,304)	**296** **(3,307)**
Las Animas colubrina	15 (55)	0 (0)	*15* *(55)*	47 (141)	0 (0)	*47* *(141)*	62 (196)	0 (0)	**62** **(196)**
Harwood's woollystar	0 (0)	33 (2,134)	*33* *(2,134)*	0 (0)	72 (1,287)	*72* *(1,287)*	0 (0)	105 (3,421)	**105** **(3,421)**
CNPS List 3, CNPS List 4, and Taxonomically Unresolved Plant Species									
ribbed cryptantha[1]	0 (0) 0 ac	78 ($9.1x10^6$) 363.12 ac	*78* *($9.1x10^6$)* *363.12 ac*	0 (0) 0 ac	143 ($5.8x10^7$) 2,299.50 ac	*143* *($5.8x10^7$)* *2,299.50 ac*	0 (0) 0 ac	221 ($6.6x10^7$) 2,622.62 ac	**221** **($6.6x10^7$)** **2,622.62 ac**
winged cryptantha	0 (0)	0 (0)	*0* *(0)*	0 (0)	9 (15)	*9* *(15)*	0 (0)	9 (15)	**9** **(15)**
Utah milkvine[2]	175 (595)	17 (26)	*192* *(621)*	79 (283)	19 (605)	*98* *(888)*	254 (878)	36 (631)	**290** **(1,509)**
desert unicorn	0 (0)	8 (9)	*8* *(9)*	0 (0)	8 (17)	*8* *(17)*	0 (0)	16 (26)	**16** **(26)**
Additional Plant Species for Consideration at the Request of BLM (La Pre 2009)									
cottontop cactus	3 (3)	5 (7)	*8* *(10)*	4 (4)	0 (0)	*4* *(4)*	7 (7)	5 (7)	**12** **(14)**
California barrel cactus	47 (51)	0 (0)	*47* *(51)*	11 (11)	0 (0)	*11* *(11)*	58 (62)	0 (0)	**58** **(62)**

[1] Ribbed cryptantha is also expressed in terms of area (acres) due to the high abundance of this species in the substation area. Plant counts are estimates, based on subsampling data from within the ribbed cyrpantha population (calculated density of 6.2 plants per square meter, or 25,091 plants per acre).

[2] This species uses shrubs for support and tends to form many twining branches that are highly variable in number. Individual plants growing at the base of the same shrub may cause an undercount; therefore, these numbers are approximate.

Table 5
Occurrence Detail for Special Status Plant Species Documented within the Reconfigured Alternative BRSA

Species Common Name	Reconfigured Alternative BRSA (Number of Occurrences [Plant Count]								
	Disturbance Area			Buffer Area			Total		
	2009	2010	*Subtotal*	2009	2010	*Subtotal*	2009 Total	2010 Total	**GRAND TOTAL**
CNPS List 1B and CNPS List 2 Plant Species									
Harwood's milkvetch	0 (0)	69 (290)	*69* *(290)*	2 (3)	42 (339)	*44* *(342)*	2 (3)	111 (629)	**113** **(632)**
Las Animas colubrina	12 (49)	0 (0)	*12* *(49)*	50 (147)	0 (0)	*50* *(147)*	62 (196)	0 (0)	**62** **(196)**
Harwood's woollystar	0 (0)	0 (0)	*0* *(0)*	0 (0)	0 (0)	*0* *(0)*	0 (0)	0 (0)	**0** **(0)**
CNPS List 3, CNPS List 4, and Taxonomically Unresolved Plant Species									
winged cryptantha	0 (0)	0 (0)	*0* *(0)*	0 (0)	8 (8)	*8* *(8)*	0 (0)	8 (8)	**8** **(8)**
Utah milkvine[1]	166 (585)	22 (92)	*188* *(677)*	88 (293)	14 (538)	*102* *(831)*	254 (878)	36 (630)	**290** **(1,508)**
desert unicorn	0 (0)	11 (21)	*11* *(21)*	0 (0)	4 (4)	*4* *(4)*	0 (0)	15 (25)	**15** **(25)**
Additional Plant Species for Consideration at the Request of BLM (LaPre 2009)									
cottontop cactus	2 (2)	3 (5)	*5* *(7)*	5 (5)	14 (28)	*19* *(33)*	7 (7)	17 (33)	**24** **(40)**
California barrel cactus	38 (42)	0 (0)	*38* *(42)*	20 (20)	0 (0)	*20* *(20)*	58 (62)	0 (0)	**58** **(62)**

[1] This species uses shrubs for support and tends to form many twining branches that are highly variable in number. Individual plants growing at the base of the same shrub may cause an undercount; therefore, these numbers are approximate.

5.3.1 Extended Discussion of Special Status Species Habitats within the Combined Study Area

Harwood's milkvetch (*Astragalus insularis* var. *harwoodii*): Although Harwood's milkvetch was consistently found in sand, the context of the sand was variable. AECOM botanists found this species in patches separated from a few to a few hundred meters from other patches. Most often they were on sandy bottoms or bars within small swales (large washes are denuded due to high flow velocity during storm events). However, a significant number of patches were in depressions within desert pavement or even disturbed areas that had partially stabilized accumulations of windblown sand. This species was often observed directly atop historic

excavation sites (e.g., the pipeline traversing the Proposed Project substation buffer) and were even observed adjacent to development and fallowed agricultural fields (Figures 3 and 4). Thus, the sandy substrate appears to be more important to Harwood's milkvetch distribution than the additional moisture that may be present in the washes (i.e., this species was not observed to be wash-dependent or vegetation-dependent, but rather it was consistently observed to be sand-dependent). Tables 4 and 5 detail the occurrences of Harwood's milkvetch within the Proposed Project and Reconfigured Alternative BRSAs.

Las Animas colubrina (*Colubrina californica*): Las Animas colubrina was observed in the incised washes within the northwestern portion of the Combined Survey Area (Figures 3 and 4). In 2009, this species was observed in flower during April, an early blooming period for this species. Las Animas colubrina was not in bloom during 2010 surveys and no new occurrences were detected beyond those documented in 2009. Tables 4 and 5 detail the occurrences of Las Animas colubrina with respect to the Proposed Project and Reconfigured Alternative BRSAs.

Ribbed cryptantha (*Cryptantha costata*): Ribbed cryptantha is a desert dune species and is very specifically limited to loose, drifting sand at elevations below 1,600 feet. The species was sometimes mixed with *C. angustifolia* or other congeners, but often was in single-species patches. The distribution of this species within the Proposed Project BRSA reflects the distribution of sand (specifically, stabilized and partially stabilized desert dunes south of I-10) (Figures 3 and 4). Tables 4 and 5 detail the occurrence of ribbed cryptantha within the Proposed Project and Reconfigured Alternative BRSAs.

While it has been found elsewhere in sandy washes, AECOM 2010 observations within the Proposed Project BRSA were almost entirely limited to various forms of dunes. Searches of other *Cryptantha* patches only a few feet away failed to turn up *C. costata* if the substrate did not meet the exacting requirements of this species.

Winged cryptantha (*Cryptantha holoptera*): Winged cryptantha primarily occurs on rocky slopes in and near desert mountain ranges, at elevations below 5,500 feet. Specimens within the Combined Survey Area were found along the hard, rocky walls of a wash at the base of the McCoy Mountains (Sanders 2010). A single observation was detected within the substation buffer of the Proposed Project BRSA, in association with the stabilized and partially stabilized desert dunes (indicating that this species may not be obligated to rocky substrates) (Figures 3 and 4). Tables 4 and 5 detail the occurrence of winged cryptantha within the Proposed Project and Reconfigured Alternative BRSAs.

Utah milkvine (*Cynanchum utahense*): Utah milkvine is a wash species, which is found twining among shrubs and perennial grasses in desert washes below about 3,000 feet in elevation. Several hundred plants were found in both 2009 and 2010 surveys, mostly in the buffer area near the McCoy Mountains. While it can be found in association with any of several shrub species, it was found with some regularity growing over big galleta grass. Washes dominated by big galleta are the favored habitat for this species within the buffer areas of the Proposed Project BRSA and the Reconfigured Alternative BRSA (Figures 3 and 4). Tables 4 and 5 detail the occurrences of Utah milkvine within the Proposed Project and Reconfigured Alternative BRSAs.

Harwood's woollystar (*Eriastrum harwoodii*): Harwood's woollystar occurs on desert dunes and loose sand in valleys below 3,000 feet in elevation. The taxonomy of this species is in transition, and the Jepson Desert Manual mentions it only as a subspecies of *E. sparsiflorum*. Andrew Sanders said that *E. sparsiflorum* is primarily a species of the Great Basin and desert mountains; plants that key out to *E. sparsiflorum,* but are found on valley bottoms, usually turn out to be *E. harwoodii* (Sanders 2010).

Within the Combined Survey Area, Harwood's woollystar was observed in stabilized and partially stabilized desert dunes south of I-10. This species was found in the same loose, sandy habitat as ribbed cryptantha and is also limited to the substation and transmission line portions of the Proposed Project BRSA (Figures 3 and 4). Tables 4 and 5 detail the occurrences of Harwood's woollystar within the Proposed Project and Reconfigured Alternative BRSAs.

Desert unicorn (*Proboscidea althaefolia*): Desert unicorn occurs in sandy washes in the Sonoran Desert below 3,200 feet in elevation. Desert unicorn has an unusual blooming period (during the summer) and produces a large hooked fruit that is transported by animals.

This species was detected within sandy washes throughout the Combined Survey Area (Figures 3 and 4). Tables 4 and 5 detail the occurrences of desert unicorn within the Proposed Project and Reconfigured Alternative BRSAs.

5.3.2 Cactus Species

BLM requested that any varieties of California barrel cactus, cottontop cactus, and hedgehog cactus be mapped for future salvage when construction begins (LaPre 2009). Six species in the Cactaceae family were observed within the Study Area. Of these species, two are within the genera targeted by BLM: California barrel cactus and cottontop cactus (Figure 4). Tables 4 and 5

detail the occurrences of these two cactus species within the Proposed Project and Reconfigured Alternative BRSAs.

6.0 DISCUSSION

This section contains a discussion of how 2009–2010 field findings may have been affected by climate and other factors. Additionally, this section discusses the potential implications of these survey results and how such results may relevant to current taxonomic work, and provides conclusions.

6.1 Climate Comparison of the 2008–2009 and 2009–2010 Seasons

Table 6 shows long-term average rainfall by month along with the specific information for the winter months between 2008 and 2010, with data taken at the Blythe Airport adjacent to the Combined Survey Area. Rainfall during the 2008–2009 winter season was somewhat above average but low in January. Corresponding totals during the 2009–2010 winter months were substantially above average with the January total over 4 times the average amount (WRCC 2009, 2010).

Table 6
Blythe Precipitation Data[1]

Time Period	Historical Average (inches): July 1948 through December 2008	Previous rain Year (inches): November 2008 through February 2009	Past rain Year (inches): November 2009 through April 2010
November	0.20	0.24	0
December	0.40	0.65	0.85
January	0.47	0.02	2.12
February	0.43	0.43	0.91
March	0.36	0	0.67
April	0.13	0	0.01
Total	**1.99**	**1.34**	**4.56**

[1] Western Regional Climate Center 2010 for Blythe Airport. Weather station name: Blythe CAA Airport, California (040927).

Rainfall patterns and totals can be a limiting factor in detecting rare plant species in desert environments. Both timing and amounts of rainfall help dictate the number of plants, number of species, and categories of species that germinate during a given rain year (Harper 1977). High midwinter rainfall during 2010 appears to have produced a larger range of plant species and higher numbers of plants than the more moderate rainfall of winter 2009.

The below-average rainfall in January 2009 and lack of late season rain events may have depressed germination of annual plant species; however, based on site conditions observed by field staff and conditions at known reference populations, sensitive plant species (annual and perennial) were detectable in spring 2009 when the surveys were conducted. In addition, some plant species were observed blooming earlier during 2009 and for shorter duration than would be expected if late season (March and April) rainfall had occurred. For example, Las Animas colubrina, a CNPS List 2.3 and a NECO species found at Blythe, typically blooms in June and July but was observed blooming in April within the BRSA. Higher rainfall in 2010 has led to the opposite effect, with more plant species and later flowering than usually expected. Not only amount, but seasonal distribution of rainfall imposes year-to-year changes in the species that germinate and dominate the flora (Cleary 2008; Harper 1977).

Between 2009 and 2010 field surveys, it is likely that sensitive species would have been highly detectable during the field survey period if they were present within the Combined Survey Area. The Combined Survey Area conditions were adequate to evaluate for general and special status plant species in both 2009 and 2010.

6.2 Conclusions

In conclusion, several observations made during spring 2010 field surveys are worth noting as recommendations for future reference. These recommendations are based on qualitative, anecdotal field observations or notes but may prove useful for impacts analysis in subsequent reports.

Of the seven special status plant species detected within the Combined Survey Area (Table 3), four are annual species. This has implications for future mitigation, including seed collection and transplantation. In past projects, mitigation of annual desert plant species through seed transplantation has encountered challenges. Seed collection and storage methods, germination and/or dispersal techniques, site selection, and weed control are all crucial to improve the chances of successful transplantation. Also, it may be useful to examine these species from a more regional perspective, as impacts to a small percentage of a prolific seed bank may be considered differently for mitigation than impacts to a small percentage of an already small or fragmented seed bank.

The 11 special status plant species with potential to occur within the Combined Survey Area that were not detected during 2009-2010 surveys (Table 3) cannot be assumed to be absent from the Combined Survey Area. With 2 consecutive years of survey data (including 1 year of above-

average rainfall) it is probable that these species do not occur within the Combined Survey Area; however, seed can persist in a dormant state for several years and it cannot always be predicted how species will respond to environmental conditions.

As an additional note, it is possible that Harwood's milkvetch is currently considered rare due to a lack of documentation and study rather than any real peril. This species was qualitatively observed within the Combined Survey Area as disturbance-loving—a large percentage of populations were growing more profusely on previously excavated or scraped areas than adjacent undisturbed areas. While it is necessary to treat such species with prudence until more is known, this raises the need to promote further botanical study of desert flora to better understand and document such rare plant species.

Fall 2010 surveys would be required to detect potentially-occurring, late-season special status plant species within the Combined Survey Area, including Abram's spurge (*Chamaesyce abramsiana*), flat-seeded spurge (*Chamaesyce platysperma*), glandular ditaxis (*Ditaxis claryana*), and pink velvet mallow (*Horsfordia alata*). These species were surveyed for in 2009 with negative results. The CEC has requested that additional areas be surveyed for these species during the 2010 fall season; however, additional fall surveys may not be necessary because mitigation and/or land acquisition for DT will include habitat for these TBD non-listed special status plant species that may or may not be within the Project Disturbance Area or Reconfigured Alternative Disturbance Area.

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ATTACHMENT 1

FIGURES

Map Location

1 inch = 40 miles

0 40 80 Miles

Blythe Solar Power Project
Botanical Survey Report

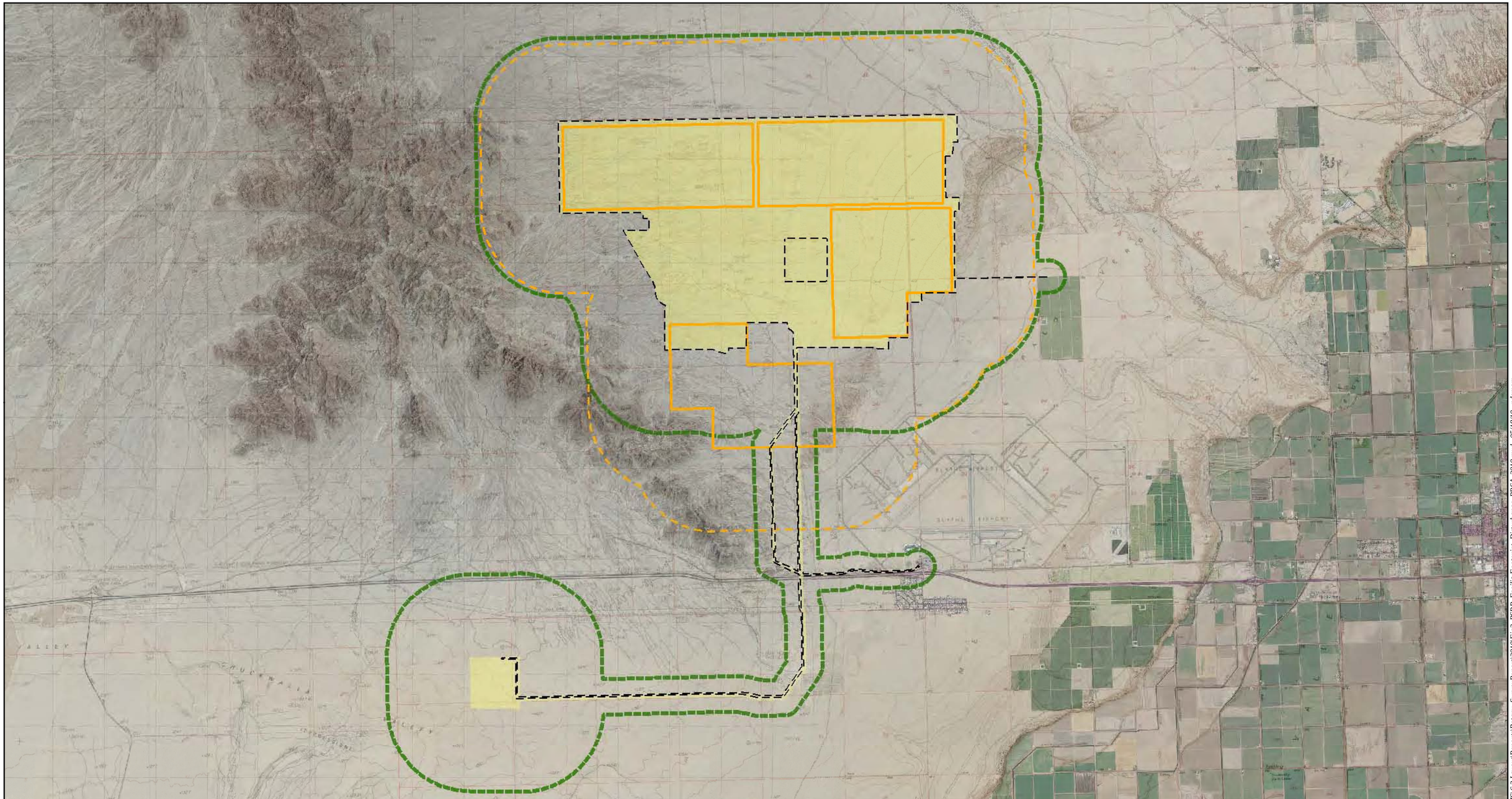
Figure 1
Regional Map

Source: ESRI; AECOM 2009

AECOM

Date: June 2010

Path: P:\2009\09080082 Sol Mil Blythe\6.0 GIS\6.3 Layout\Reports\Botany_SurveyReport\2010\Fig1_BSPP_RegionalLocation20100511.mxd, 05/18/10, ndemom



Map Location

Legend

- Proposed Project Study Area
- Proposed Project BRSA
- Reconfigured Alternative Disturbance Area
- Reconfigured Alternative BRSA
- Project Disturbance Area

Source: NAIP 2009; AECOM 2009

N W E S

1 in = 6,000 feet

0 6,000 12,000 Feet

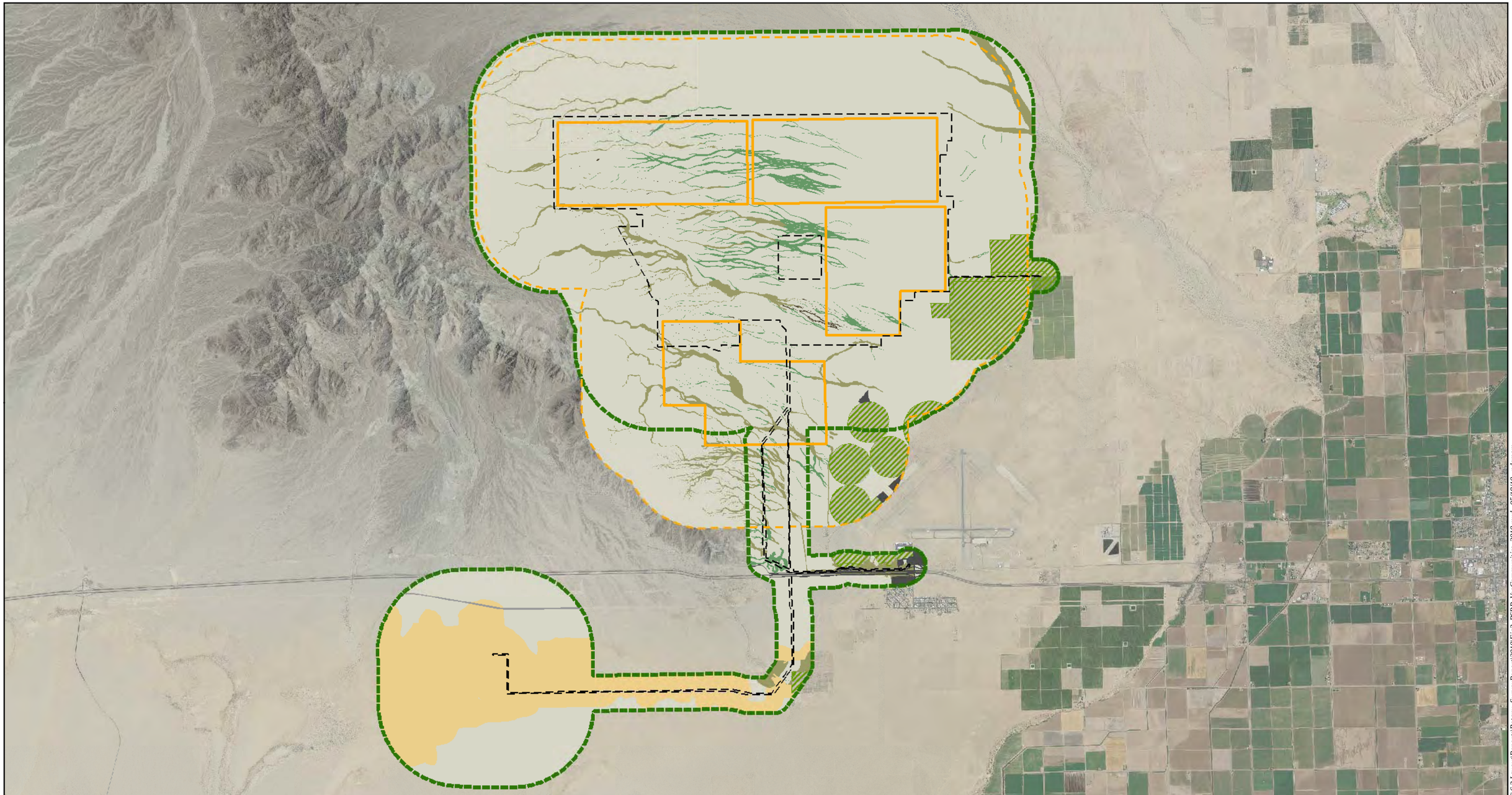
Blythe Solar Power Project
Botanical Survey Report

Figure 2
Project Study Areas and Biological Resources Survey Area

AECOM

Date: June 2010

Path: P:\20090/90800982 Sol MII Blythe\6.0 GIS\6.3 Layout\Reports\Botany_SurveyReport\2010\Fig2_BSPP_FacilityFootprint_Disturbance_BRSA_2010.mxd, 05/18/10, ndemom



Map Location

Legend

- Proposed Project BRSA
- Reconfigured Alternative Disturbance Area
- Alternative Study Area 1-mile Buffer
- Project Disturbance Area

Vegetation Communities

Riparian
- Creosote Bush - Big Galleta Association
- Desert Dry Wash Woodland
- Unvegetated Ephemeral Dry Wash

Upland
- Sonoran Creosote Bush Scrub
- Stabilized and Partially Stabilized Desert Dunes

Other
- Agriculture (Active and Fallow)
- Disturbed
- Developed

Source: NAIP 2009; AECOM 2009; EDAW 2009

N W E S

1 in = 6,000 ft

0 6,000 12,000 Feet

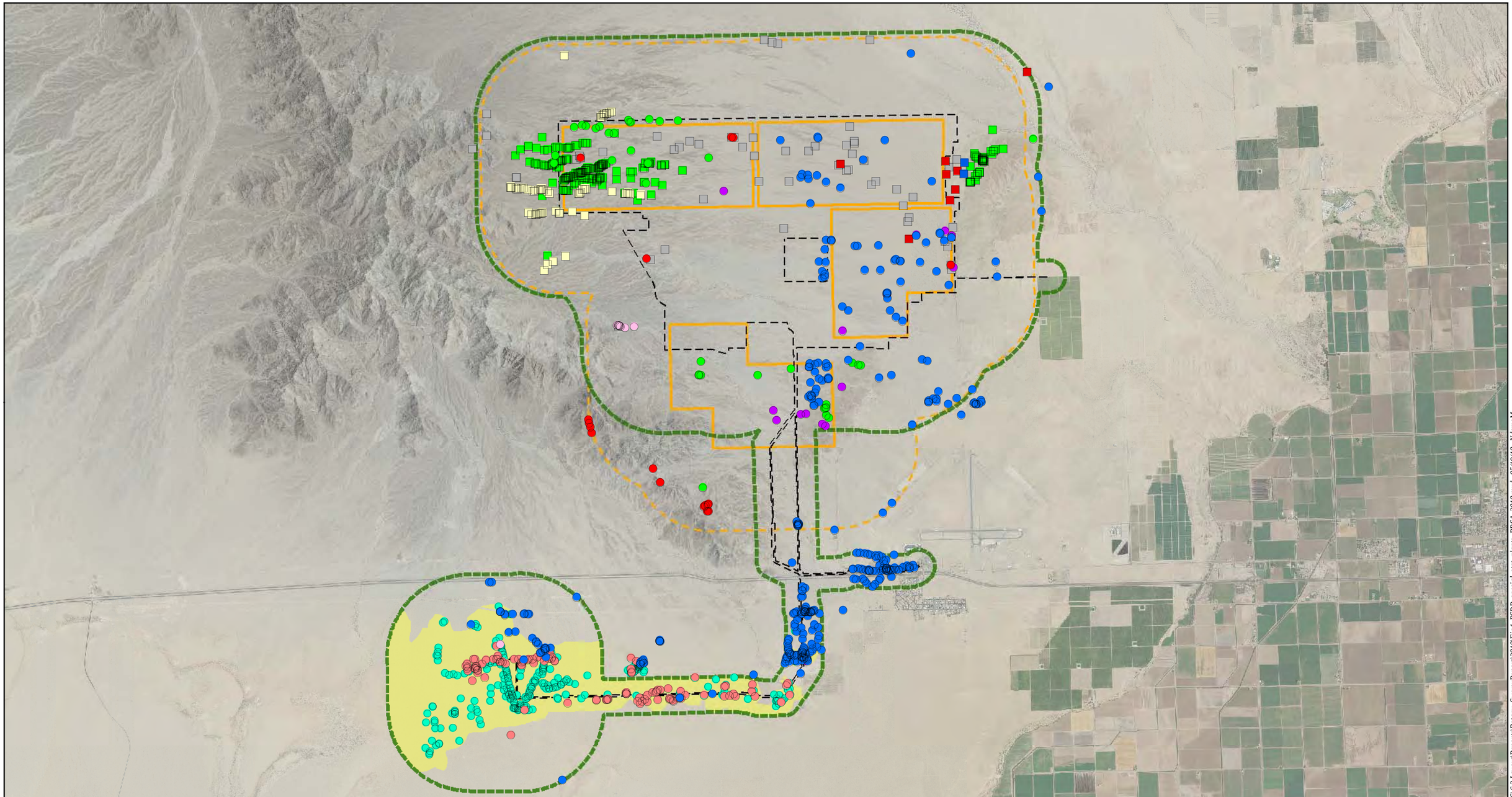
Blythe Solar Power Project
Botanical Survey Report

Figure 3
Vegetation Communities

AECOM

Date: June 2010

Path: P:\20090908082 Sol Mil Blythe\6.0 GIS\6.3 Layout\Reports\Botany_SurveyReport\2010\Fig3_BSPP_VegCommunities_2010.mxd, 05/18/10, ndemom



Map Location

Legend

- Proposed Project BRSA
- Reconfigured Alternative Disturbance Area
- Reconfigured Alternative BRSA
- Project Disturbance Area
- Ribbed cryptantha occupied habitat

Rare Plant Observations (2010)

- ribbed cryptantha
- winged cryptantha
- cottontop cactus
- desert unicorn
- Utah milkvine
- Harwood's woollystar
- Harwood's milkvetch

Rare Plant Observations (2009)

- Harwood's milkvetch
- Las Animas colubrina
- Utah milkvine
- cottontop cactus
- California barrel cactus

Source: NAIP 2009; AECOM 2010

N W E S

1 inch = 6,000 feet

0 6,000 12,000 Feet

Blythe Solar Power Project
Botanical Survey Report

Figure 4
Special Status Plant Species Observations

AECOM

Date: June 2010

Path: P:\2009\09080082 Sol MI Blythe\6.0 GIS\6.3 Layout\Reports\Botany_SurveyReport\2010\Fig4_BSPP_special_stat_plants_BRSA_2010.mxd, 05/19/10, NdemoM

ATTACHMENT 2

BIOLOGIST QUALIFICATIONS

Attachment 2
Biologist Qualifications

Name	Affiliation	Surveys Performed	Qualifications
Bergman, Erin	AECOM	Botanical	MS, Biology/Botany, San Diego State University, San Diego California BS, Biology, Portland State University, Portland Oregon BS, Health and Fitness/Philosophy, Gonzaga University, Spokane, Washington Over 8 years of experience as a biologist studying and working with rare plants, invasive species, restoration of habitat, and vegetation mapping in Oregon, Washington, Indiana and Puerto Rico. Three years of experience in Southern California working on restoration plans for State Parks, botanical surveys, rare plant surveys and wetland surveys. Has been trained to survey rare plants in the Mojave and Colorado Deserts, including fall blooming endemics. Published work on rare plants in the tropics and southern California.
Beyerl, Tammie	AECOM	Botanical	M.S., Plant Biology, Southern Illinois University, B.A., Plant Biology, Southern Illinois University Eight years of botanical field experience in California conducting rare plant surveys, wetland delineation, noxious weed surveys, mapping and describing plant communities, performing wetland assessments, and analyzing biological constraints.
Bibbo, Mark	AECOM	Botanical	M.S., Horticulture and Agronomy , University of California, Davis, B.A., Environmental Studies, University of California, Santa Cruz Six years of experience in plant community mapping, rare plant surveys, and floristic inventories throughout California.

Name	Affiliation	Surveys Performed	Qualifications
Duffels, Jeanette	AECOM	Botanical	BA Environmental Studies (Emphasis in Biology), Occidental College, Los Angeles Nine years of experience as a field botanist conducting vegetation mapping, focused rare plant surveys, and habitat assessments throughout southern California. Extensively surveyed the flora of Los Angeles County and has regional experience in Ventura, Riverside, San Diego, Kern Counties and the Great Basin.
Dwerlkotte, Richard	AECOM	Botanical	BS Environmental Biology and graduate studies, Humboldt State University Nineteen years experience as a field botanist and ecologist conducting botanical resource studies on over 100 projects in the western U.S. and northern Great Plains including rare plant surveys, vegetation mapping, wetland delineation, noxious weed surveys, biological constraints and impacts analyses on a wide variety of projects, and assessments of the effects of altered river hydrology on riparian and wetland vegetation.
Harper, Kyle	AECOM	Botanical	BS Environmental Systems (Ecology, Behavior, and Evolution), University of California, San Diego Four years of focused experience as a botanist. Conducted vegetation mapping and focused rare plant surveys throughout coastal and inland southern California. Extensively surveyed the flora of San Diego County and has also been trained to survey for rare plants of the Mojave and Colorado Deserts, including fall-blooming endemics. Highly proficient in the use and customization of Geographic Information System (GIS), Visual Basic, Microsoft Access, and other data management applications.

Name	Affiliation	Surveys Performed	Qualifications
Hendricks-Morgal, Bonnie	AECOM	Botanical	MS, Biology, Ecology Emphasis, San Diego State University BS, Biology, Magna Cum Laude, Western Washington University Eighteen years of professional experience as a biologist in the environmental consulting field. Conducted and managed ecological and botanical field studies for numerous projects in southern California. Has expertise in rare plant and floristic surveys, vegetation classification and mapping, wetland delineation and permitting, restoration and monitoring of vernal pool habitat, wildlife tracking and corridor analysis, and regional conservation planning.
McMillan, Scott	AECOM	Botanical (Senior Review Only)	BS Biology and graduate studies, San Diego State University More than 18 years experience as botanist and restoration ecologist in the Western U.S. and Baja California, Mexico. Conducted general botany, rare plant surveys, vegetation analyses, and other impact studies on over 100 projects in the southwest. Also developed and implemented numerous native habitat and wildlife habitat restoration programs, many of which included endangered plant and animal species.
Sanders, Andrew	University of California, Riverside	Botanical	Curator/Museum Scientist of the University of California Herbarium Specializes in the plants of southern California.
Silverman, David	Xeric Botanical Consulting	Botanical	Sixteen years of experience conducting floristic and rare plant surveys, vegetation sampling and mapping, on projects throughout the Southwest, for numerous clients and agencies, including 100+ biological survey projects in the desert regions.

Name	Affiliation	Surveys Performed	Qualifications
Singh, Onkar	AECOM	Botanical	BS Biology, Fresno State University Seven years of experience in conducting comprehensive floristic and vegetation studies with extensive familiarity with the California desert floristic province.
Sproul, Fred	AECOM	Botanical	BS Biology, San Diego State University, education Miami University Thirty years of experience conducting rare plant surveys and mapping of vegetation, including on San Diego County unincorporated lands. Regional experience in Riverside, Inyo, and Kern Counties and Great Basin.
St. John, Ted	AECOM	Botanical	Ph.D. Physiological Plant Ecology, University of California, Irvine. Almost forty years experience in botany and plant ecology, including internationally recognized research in root growth, soil microbiology, mycorrhizal symbiosis, and other fields directly related to restoration ecology. I devised methods and principles that now figure importantly in the practice of restoration, and have written and spoken widely on mycorrhizal symbiosis and microbial ecology as they figure in restoration.
Woolley, Lance	AECOM	Botanical	MA Botany, Humboldt State University Three years of professional experience as a botanist that includes performing rare plant surveys, vegetation mapping, and habitat assessments throughout the northern and southern California regions.

ATTACHMENT 3

LETTER FROM ANDREW SANDERS
REGARDING COACHELLA VALLEY MILKVETCH

UNIVERSITY OF CALIFORNIA, RIVERSIDE

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COLLEGE OF NATURAL AND AGRICULTURAL SCIENCES
CITRUS RESEARCH CENTER AND
AGRICULTURAL EXPERIMENT STATION

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June 15, 2010

Andrew Sanders
Curator, UCR Herbarium
Department of Botany & Plant Sciences
University of California
Riverside, California 92521

Kyle Harper
Project Biologist
AECOM
1420 Kettner Blvd, Suite 500
San Diego, California 92119

Subject: Potential for Occurrence of Coachella Valley Milkvetch in the Desert Center and/or Blythe Areas

Dear Mr. Harper:

In December 2009, I reviewed herbarium specimens of the southern California varieties of *Astragalus lentiginosus*, including the federally endangered Coachella Valley milkvetch (*Astragalus lentiginosus* var. *coachellae*). My review included the Desert Center collections of supposed Coachella Valley milkvetch (Dice 980324-2; Dice 980324-3; and Sears 1173). Later, during spring of 2010, I participated in field surveys for the Blythe Solar Power Project and the Palen Solar Power Project, at which time I visited potential Coachella Valley milkvetch habitat in the Desert Center to Blythe region

I have worked extensively with the genus *Astragalus* within southern California during my career of over 30 years as curator of the UCR Herbarium, and am generally very familiar with the plants of the California desert. After careful review of the Desert Center collections, I determined that those attributed as Coachella Valley milkvetch are best considered to be misidentified specimens of freckled milkvetch (*Astragalus lentiginosus* var. *variabilis*). Freckled milkvetch is not a special status plant species, as it is widespread on the southern California deserts. The two taxa are similar and probably closely related within the *A. lentiginosus* complex. Both are also sufficiently variable

that past confusion is understandable, but the Desert Center plants do not fit the description of *Astragalus lentiginosus* var. *coachellae* well.

I believe that the best evidence to date indicates that Coachella Valley milkvetch is endemic to the Coachella Valley, and does not occur elsewhere. There are no reliable records of this taxon in the Desert Center region, just a few somewhat ambiguous *A. l. variabilis* specimens that have been misidentified in the past. The distribution of Coachella Valley milkvetch appears to be restricted to the extensive loose sands of the Coachella Valley and the surrounding rocky habitats have confined it to that one valley. Dispersal out of the valley into potentially suitable habitats elsewhere appears never to have occurred. The Desert Center area is over 60 miles east of the Coachella Valley, which is a considerable geographic barrier between the two locations, given the lack of sand dunes in the intervening region.

Even though the Desert Center and Blythe areas contain vast expanses of sandy habitat that appear suitable for Coachella Valley milkvetch, based on my review of existing records I do not expect Coachella Valley milkvetch to occur in the Desert Center or Blythe areas.

Sincerely,

Andrew C. Sanders

Andrew Sanders
Curator, UCR Herbarium

ATTACHMENT 4

RECORD OF REFERENCE POPULATION VISITS, HERBARIA REVIEW, AND CREW TRAINING

Attachment 4
Record of Reference Population Visits, Herbaria Review, and Crew Training

Both prior to and during spring 2009 and spring 2010 botanical surveys for the Blythe Solar Power Project, several steps were taken to ensure crews were adequately trained and had a proper frame of reference regarding plant phenology. This supplemental attachment serves as a record of these preparatory actions.

Table A4-1 details the steps taken for each special status species determined to have potential to occur within the 2009-2010 Combined Survey Area. Following Table A3-1 are photos of the crew training held March 22, 2010 as well as copies of the pictorial field guides distributed to field botanists.

Table A4-1
Summary of Preparation for Special Status Plant Species with Potential to Occur within the Combined Survey Area

Common Name ***Scientific Name***	**Preparatory Action(s) Taken**
CNPS List 1B and CNPS List 2 Plant Species	
Coachella Valley Milkvetch *Astragalus lentiginosus* var. *coachellae*	A CNDDB element occurrence as visited by Lance Woolley, Carolyn Martus, and Ceasera Wendin on April 17, 2009, south of I-10 along the east side of Indian Canyon Drive in Palm Springs. Approximately 20 plants occurred at the margin of the road. Plants were in flower and fruit and occurred in disturbed area with Saharan mustard (*Brassica tournefortii*) and Russian tumbleweed (*Salsola tragus*). In 2010, Andrew Sanders had already confirmed the voucher specimens outside of Coachella Valley to be misidentified *A. lentiginosus* var. *variabilis*. Thus, the expectation of finding this species was reduced. Pictorial guides containing this species were distributed to field crews in 2009 and 2010, and each botanist was required to confirm the identity of ALL *Astragalus* observations. No varieties of *A. lentiginosus* were observed within the Combined Survey Area.
Angel trumpets *Acleisanthes longiflora*	This species was considered during a review of herbarium specimens from the University of California, Riverside. The specimens and training were provided by Andrew Sanders on March 22, 2010. Pictorial guides containing this species were distributed to field crews in 2009 and 2010.
Small-flowered androstephium *Androstephium breviflorum*	This species was considered during a review of herbarium specimens from the University of California, Riverside. The specimens and training were provided by Andrew Sanders on March 22, 2010. Pictorial guides containing this species were distributed to field crews in 2010.

Common Name ***Scientific Name***	**Preparatory Action(s) Taken**
Harwood's milkvetch *Astragalus insularis* var. *harwoodii*	A CNDDB element occurrence was visited by Fred Sproul, Lance Woolley, and Carolyn Martus on March 18, 2009, southwest of Blythe near 33.595852 N 114.755803 W. Two small dead Astragalus species were detected without flowers or fruit in open sandy substrate occupied by highly disturbed Sonoran creosote bush scrub. Insufficient material was available for positive identification. On March 9, 2010, this species was detected during initial site surveys of the Combined Survey Area. Andrew Sanders confirmed this on March 15, 2010, when he accompanied field crews to the observation location. The plants were in bloom and were confirmed as Harwood's milkvetch. Pictorial guides containing this species were distributed to field crews in 2009 and 2010, and each botanist was brought to the known location to obtain a search image.
California ayenia *Ayenia compacta*	This species was considered during a review of herbarium specimens from the University of California, Riverside. The specimens and training were provided by Andrew Sanders on March 22, 2010. Pictorial guides containing this species were distributed to field crews in 2010.
Fairyduster *Calliandra eriophylla*	This species was considered during a review of herbarium specimens from the University of California, Riverside. The specimens and training were provided by Andrew Sanders on March 22, 2010. Pictorial guides containing this species were distributed to field crews in 2009 and 2010.
Alkali mariposa lily *Calochortus striatus*	This species was considered during a review of herbarium specimens from the University of California, Riverside. The specimens and training were provided by Andrew Sanders on March 22, 2010. Pictorial guides containing this species were distributed to field crews in 2009 and 2010.
Crucifixion thorn *Castela emoryi*	This species was observed by Fred Sproul and Andrew Fisher on November 12, 2009 along State Route 98 southeast of Ocotillo, California, at the Bureau of Land Management Crucifixion Thorn Natural Area, Yuha Desert. Many large shrubs were present and in fruit. This species was observed in a dormant state by Fred Sproul and Mark Bibbo on March 17, 2010, during a trip to the University of California Sweeny Granite Mountain Preserve. Pictorial guides containing this species were distributed to field crews in 2009 and 2010.
Abram's spurge *Chamaesyce abramsiana*	This species was observed by Fred Sproul and Andrew Fisher on November 12, 2009,, along State Route 98 southeast of Ocotillo, California, at the Bureau of Land Management Crucifixion Thorn Natural Area, Yuha Desert. Recent rains had brought up significant annual flora and shrubs and trees were green and leafed out. Annuals included filaree (*Erodium cicutarium*) and chinchweed (*Pectis papposa*). This species will be considered prior to fall 2010 botanical surveys, which will be conducted by Andrew Sanders. Pictorial guides containing this species were distributed to field crews in 2009 and will also be distributed to fall 2010 field crews.
Flat-seeded spurge *Chamaesyce platysperma*	This species will be considered prior to fall 2010 botanical surveys, which will be conducted by Andrew Sanders. Pictorial guides containing this species were distributed to field crews in 2009 and will also be distributed to fall 2010 field crews.

Common Name ***Scientific Name***	**Preparatory Action(s) Taken**
Las Animas colubrina *Colubrina californica*	This species was detected in large numbers within the Combined Survey Area during 2009. As a result, crews had a highly calibrated search image during 2010 surveys. This species was considered during a review of herbarium specimens from the University of California, Riverside. The specimens and training were provided by Andrew Sanders on March 22, 2010. Pictorial guides containing this species were distributed to field crews in 2009 and 2010.
Glandular ditaxis *Ditaxis claryana*	This species will be considered prior to fall 2010 botanical surveys, which will be conducted by Andrew Sanders. Pictorial guides containing this species will be distributed to fall survey field crews.
Harwood's woollystar *Eriastrum harwoodii*	On March 9, 2010, this species was detected during initial site surveys of the Combined Survey Area. Andrew Sanders observed this location on March 15, 2010, when he accompanied field crews, but the plants were not mature enough to identify definitively. By Mach 29, 2010, the plants were observed in bloom/fruit and were confirmed as Harwood's woollystar. This species was also considered during a review of herbarium specimens from the University of California, Riverside. The specimens and training were provided by Andrew Sanders on March 22, 2010. Pictorial guides containing this species were distributed to field crews in 2010, and each botanist was brought to the known location to obtain a search image.
Pink velvet mallow *Horsfordia alata*	This species will be considered prior to fall 2010 botanical surveys, which will be conducted by Andrew Sanders. Pictorial guides containing this species were distributed to field crews in 2009 and will also be distributed to fall 2010 field crews.
Bitter hymenoxys *Hymenoxys odorata*	This species was observed in a vegetative state by Fred Sproul and Mark Bibbo on March 17, 2010, during a trip to the University of California Sweeny Granite Mountain Preserve. This species was considered during a review of herbarium specimens from the University of California, Riverside. The specimens and training were provided by Andrew Sanders on March 22, 2010. Pictorial guides containing this species were distributed to field crews in 2010.
California satintail *Imperata brevifolia*	This species was considered during a review of herbarium specimens from the University of California, Riverside. The specimens and training were provided by Andrew Sanders on March 22, 2010. Pictorial guides containing this species were distributed to field crews in 2009 and 2010.
Spearleaf *Matelea parvifolia*	This species was considered during a review of herbarium specimens from the University of California, Riverside. The specimens and training were provided by Andrew Sanders on March 22, 2010. Pictorial guides containing this species were distributed to field crews in 2010.
Argus blazing star *Mentzelia puberula (M. oreophila)*	This species was considered during a review of herbarium specimens from the University of California, Riverside. The specimens and training were provided by Andrew Sanders on March 22, 2010. Pictorial guides containing this species were distributed to field crews in 2010.
Lobed ground cherry *Physalis lobata*	This species was considered during a review of herbarium specimens from the University of California, Riverside. The specimens and training were provided by Andrew Sanders on March 22, 2010. Pictorial guides containing this species were distributed to field crews in 2010.

Common Name ***Scientific Name***	**Preparatory Action(s) Taken**
Orocopia sage *Salvia greatae*	This species was considered during a review of herbarium specimens from the University of California, Riverside. The specimens and training were provided by Andrew Sanders on March 22, 2010. Pictorial guides containing this species were distributed to field crews in 2009 and 2010.
Desert spikemoss *Selaginella eremophila*	This species was considered during a review of herbarium specimens from the University of California, Riverside. The specimens and training were provided by Andrew Sanders on March 22, 2010. Pictorial guides containing this species were distributed to field crews in 2009 and 2010.
Coves' cassia *Senna covesii*	This species was considered during a review of herbarium specimens from the University of California, Riverside. The specimens and training were provided by Andrew Sanders on March 22, 2010. Pictorial guides containing this species were distributed to field crews in 2009 and 2010.
Dwarf germander *Teucrium cubense* ssp. *depressum*	This species was considered during a review of herbarium specimens from the University of California, Riverside. The specimens and training were provided by Andrew Sanders on March 22, 2010. Pictorial guides containing this species were distributed to field crews in 2009 and 2010.
Jackass clover *Wislizenia refracta* ssp. *refracta*	This species was considered during a review of herbarium specimens from the University of California, Riverside. The specimens and training were provided by Andrew Sanders on March 22, 2010. Pictorial guides containing this species were distributed to field crews in 2009 and 2010.
Orcutt's woody-aster *Xylorhiza orcuttii*	This species was considered during a review of herbarium specimens from the University of California, Riverside. The specimens and training were provided by Andrew Sanders on March 22, 2010. Pictorial guides containing this species were distributed to field crews in 2010.
CNPS List 3, CNPS List 4, and Taxonomically Unresolved Plant Species	
Ribbed cryptantha *Cryptantha costata*	On March 9, 2010, this species was detected during initial site surveys of the Combined Survey Area. Andrew Sanders observed this location on March 15, 2010, when he accompanied field crews. Field crews were brought to this location to obtain a search image. This species was also considered during a review of herbarium specimens from the University of California, Riverside. The specimens and training were provided by Andrew Sanders and Onkar Singh on March 22, 2010. Pictorial guides containing this species were distributed to field crews in 2010, and each botanist was brought to the known location to obtain a search image.
Winged cryptantha *Cryptantha holoptera*	This species was first observed and confirmed in the Combined Survey Area by Andrew Sanders on March 15, 2010. Field crews were brought to this site, or other locations in the Combined Survey Area to obtain a search image. This species was also considered during a review of herbarium specimens from the University of California, Riverside. The specimens and training were provided by Andrew Sanders and Onkar Singh on March 22, 2010. Pictorial guides containing this species were distributed to field crews in 2009 and 2010, and each botanist was brought to the known location to obtain a search image.
Utah milkvine *Cynanchum utahense*	This species was detected in large numbers within the Combined Survey Area during 2009. As a result, crews had a highly calibrated search image during 2010 surveys. This species was considered during a review of herbarium specimens from the University of California, Riverside. The specimens and training were provided by Andrew Sanders on March 22, 2010. Pictorial guides containing this species were distributed to field crews in 2009 and 2010.

Common Name ***Scientific Name***	**Preparatory Action(s) Taken**
Snakewood *Condalia globosa* var. *pubescens*	Pictorial guides containing this species were distributed to field crews in 2010.
Foxtail cactus *Corypantha alversonii*	In 2009, a CNDDB element occurrence was visited by Fred Sproul, Richard Dwerlkotte, and Carlolyn Martus on April 9, 2009, at a gravel pit northwest of Blythe along State Route 95 near 33.713185 N 114.538671W. Several individuals were observed in relatively undisturbed Sonoran creosote bush scrub on granitic rock adjacent to a mining operation. In 2009 and 2010, pictorial guides containing this species were distributed to field crews. Both Fred Sproul and Rich Dwerlkotte participated in 2010 surveys and provided guidance to other crew members regarding this species.
California ditaxis *Ditaxis serrata* var. *californica*	Pictorial guides containing this species were distributed to field crews in 2009 and 2010.
Desert portulaca *Portulaca halimoides*	Pictorial guides containing this species were distributed to field crews in 2010.
Desert unicorn *Proboscidea althaeifolia*	This species was detected on March 8, 2010, during initial site reconnaissance of the Combined Survey Area. Andrew Sanders confirmed this on March 16, 2010, when he accompanied field crews to the observation location. The plants were in bloom and were confirmed as desert unicorn. Pictorial guides containing this species were distributed to field crews in 2010, and each botanist was brought to the known location to obtain a search image.
Additional Plant Species for Consideration at the Request of BLM	
Cottontop cactus *Echinocactus polycephalus var. polycephalus*	This species was detected on numerous occasions within the Combined Survey Area during 2009. As a result, crews had a highly calibrated search image during 2010 surveys. Crews were required to key out all cactus observations.
Hedgehog cactus *Echinocereus engelmannii*	Crews were required to key out all cactus observations.
Hedgehog cactus *Echinocereus triglochidiatus*	Crews were required to key out all cactus observations.
California barrel cactus *Ferocactus cylindraceus*	This species was detected on numerous occasions within the Combined Survey Area during 2009. As a result, crews had a highly calibrated search image during 2010 surveys. Crews were required to key out all cactus observations.

Photographs of March 22, 2010 Crew Training - Conducted by Andrew Sanders

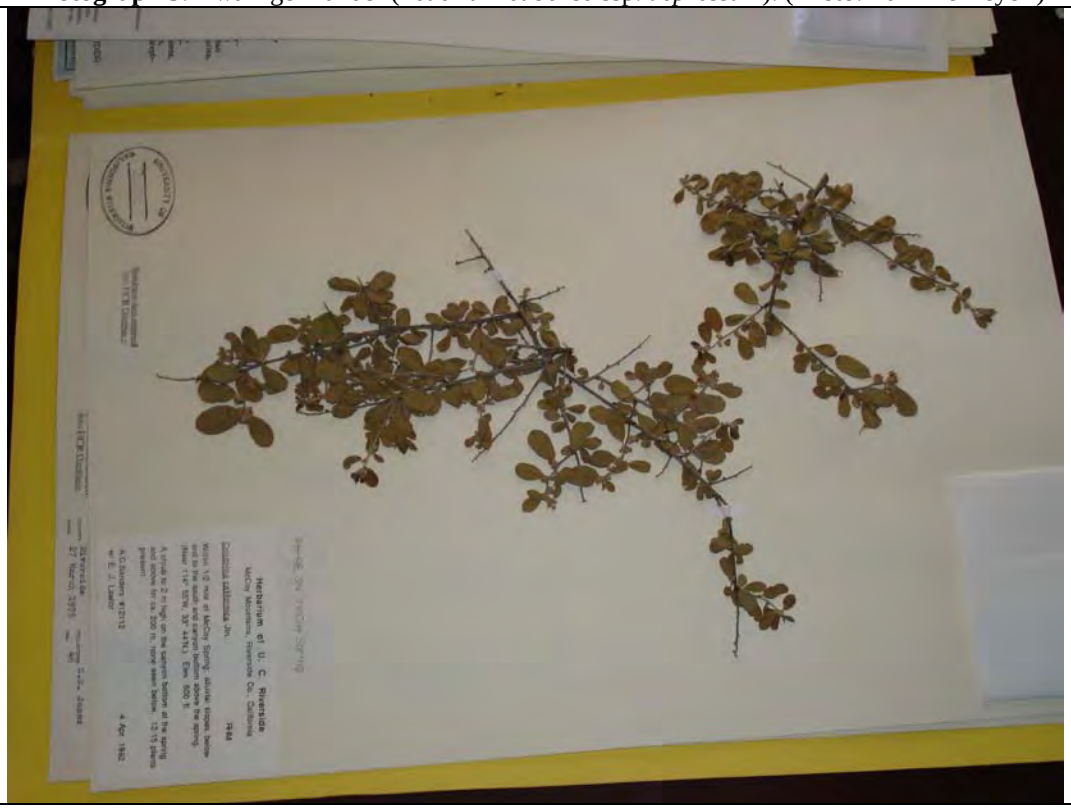
Photograph 1: (from left) Mark Bibbo, Rich Dwerlkotte, Andrew Sanders, Onkar Singh, Fred Sproul.
(Photo: Tammie Beyerl)

Photograph 2: (from left) Lance Woolley, Rich Dwerlkotte, Andy Sanders, Mark Bibbo.
(Photo: Tammie Beyerl)

Photograph 3: Fred Sproul looking over specimens, receiving direction from Andrew Sanders.
(Photo: Tammie Beyerl)

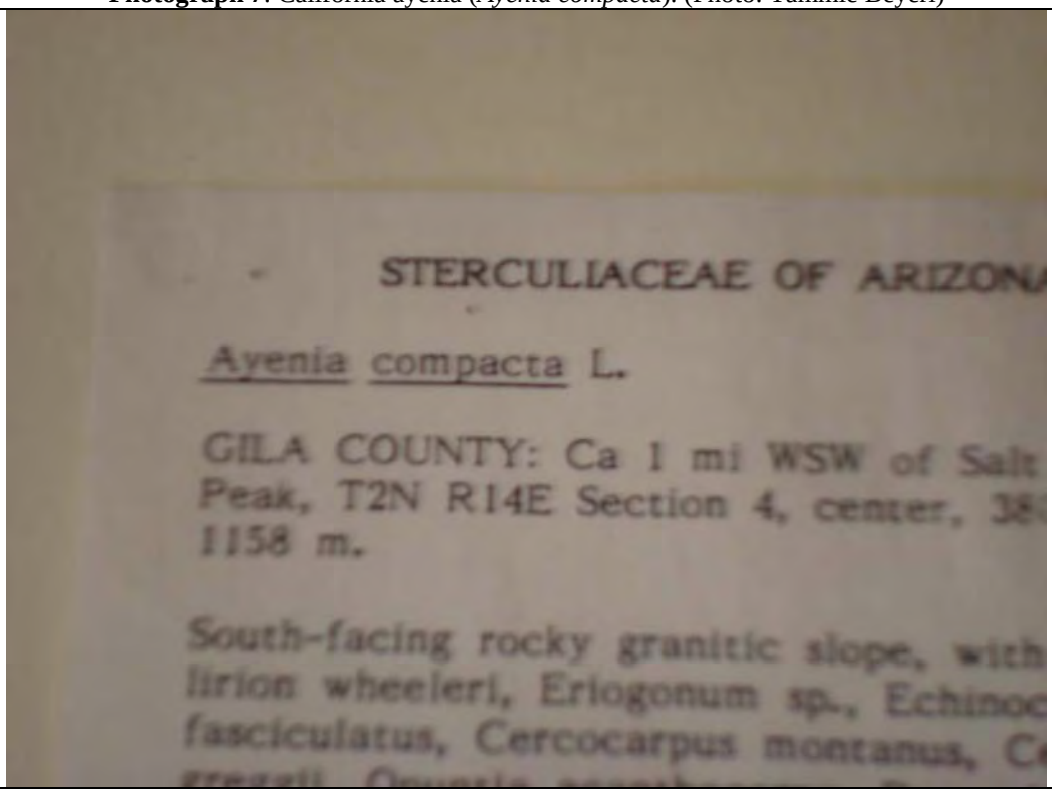
Photograph 4: Rich Dwerlkotte and Onkar Singh looking over specimens.
(Photo: Tammie Beyerl)

Photograph 5: Dwarf germander (*Teucrium cubense* ssp. *depressum*). (Photo: Tammie Beyerl)

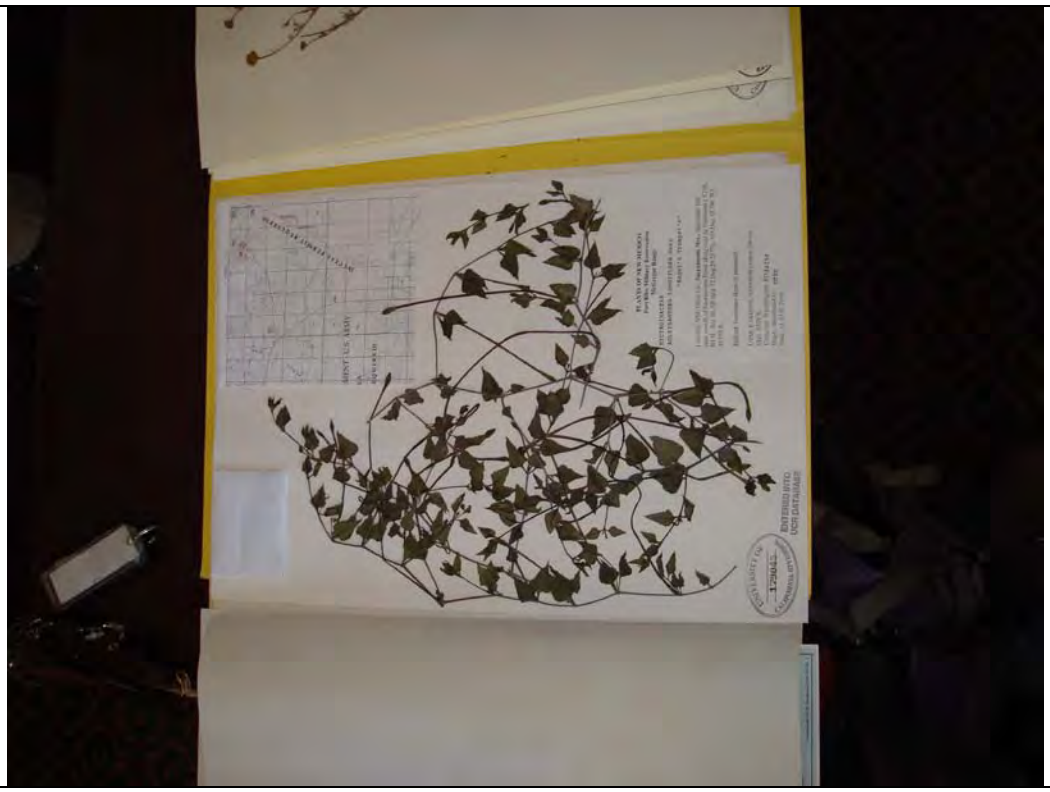


Photograph 6: Las Animas Colubrina (*Colubrina californica*). (Photo: Tammie Beyerl)

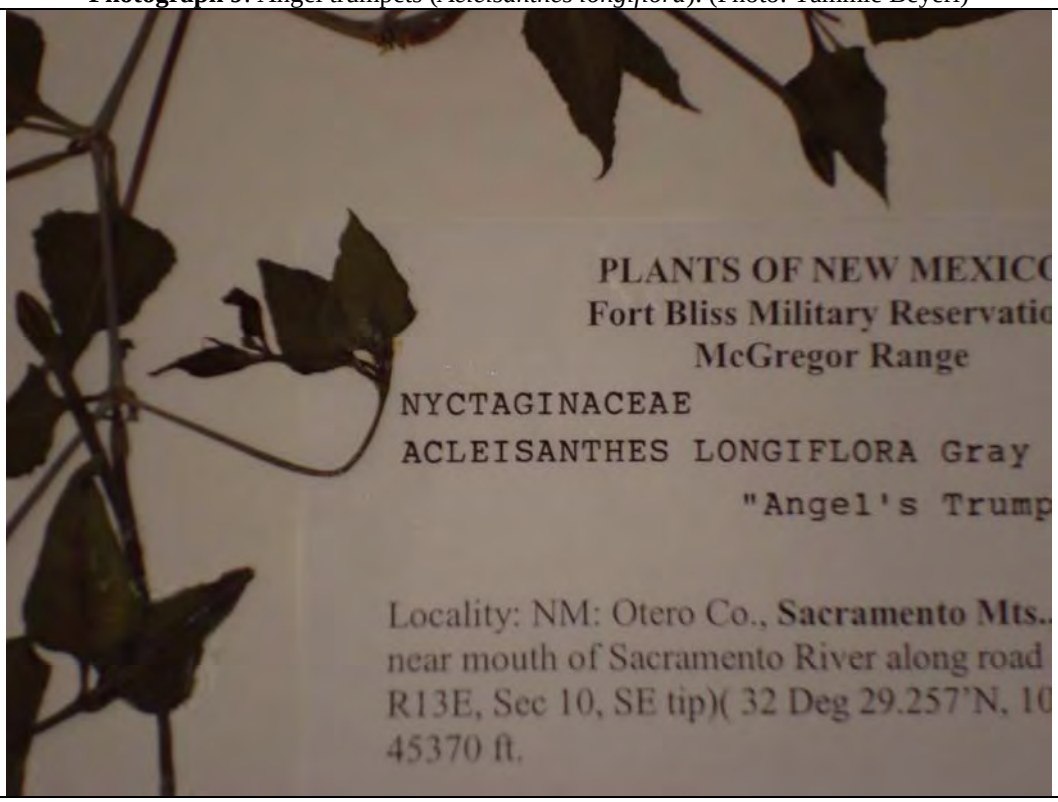
Photograph 7: California ayenia (*Ayenia compacta*). (Photo: Tammie Beyerl)



Photograph 8: Label for California ayenia. (Photo: Tammie Beyerl)

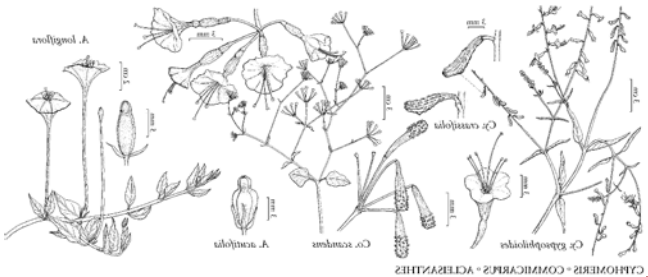


Photograph 9: Angel trumpets (*Acleisanthes longiflora*). (Photo: Tammie Beyerl)



Photograph 10: Label for angel trumpets. (Photo: Tammie Beyerl)

Solar Millennium Blythe/Palen Sensitive Plant Species List

Name	Picture	Description
Acleisanthes longiflora (Angel trumpets) Nyctaginaceae CNPS List 2.3	 	**Life form:** Annual or perennial herb from crown, glabrous to hairy; hairs sometimes forked at base, branches parallel with leaf surface, sometimes very unequal **Stem** 0 or prostrate to erect **Leaves** odd-1-pinnate; leaflets generally jointed to midrib; stipules membranous, sometimes fused around stem at stem base **Inflorescence**: raceme, axillary, sometimes head- or umbel-like; flowers 2–many **Flower** bilateral; calyx 5-lobed; banner outside wings in bud, keel blades with small protrusion at base locking into pit on adjacent wing; 9 filaments fused, 1 free; ovary (and fruit) generally sessile, style slender, stigma minute **Fruit** generally 1- or ± 2-chambered, often mottled, generally becoming ± dry; placenta on upper suture **Seeds** 2–many, smooth, compressed, ± notched at attachment scar Very difficult; both flower and fruit needed for identification; many good species appear similar; some species complexes need study. Taxa near province boundaries may appear in > 1 key. Varieties keyed under species for simplicity; species with vars. so identified in key. Fr length includes beak and any stalk-like base unless fruit body specified. **Ecology** Sonoran desert scrub (carbonate) **Elevation** 90-95 m **Flowering time:** May **Distribution** Known in CA only from one occurrence in the Maria Mts.

Name	Picture	Description
Astragalus crotalariae (Salton milk-vetch) Fabaceae CNPS List 4		Perennial (often flowering first season and seemingly annual), bushy-clumped, coarse, ± ill-scented, ± strigose **Stem** ± erect, 1.5–6 dm, often hollow **Leaf** 5–16.5 cm; leaflets 9–19, 5–35 mm, ± obovate to round, flat, thick, tips notched **Inflorescence**: flowers 10–25, ascending or spreading **Flower**: calyx 7.6–12.3 mm; petals bright reddish purple, sometimes white, banner 21–28 mm, recurved ± 40°, keel 17–21 mm **Fruit**: body 20–30 mm, 10–14 mm wide, inflated, ovate in side view, sparsely to densely strigose, with fine, net-like pattern, drying thickly papery; stalk-like base 1–1.5 mm, stout; beak erect or incurved, tipped by persistent style-base; sutures ± raised; chamber 1 **Chromosomes:** 2*n*=24 **Ecology:** UNCOMMON. Sandy or gravelly areas **Elevation:** -60–250 m. **Bioregional distribution:** Sonoran Desert **Distribution outside California:** w Arizona, n Baja California **Flowering time:** Jan–Apr

Solar Millennium Blythe/Palen Sensitive Plant Species List

Name	Picture	Description
Astragalus insularis var. *harwoodii* (Harwood's milk-vetch) Fabaceae CNPS List 2.2		**Life form:** Annual, ± grayish strigose **Stem** decumbent to ascending, 5–40 cm, slender **Leaf** 2–12 cm; leaflets 9–21, ± well separated, 4–20 mm, ± narrowly elliptic or oblong, tips generally notched **Inflorescence** among leaves; flowers 4–9, well separated, early spreading, then reflexed **Flower**: petals pink-violet, banner 5.5–7.4 mm, recurved ± 50–60°, keel 4.8–6 mm **Fruit** spreading or ± reflexed, 15–24 mm, 5–15 mm wide, half-ovoid, bladdery, papery, sparsely strigose; beak conspicuous; upper suture straight or ± convex; lower suture strongly convex; chamber 1; immature seeds 7–14 **Ecology:** Sandy or gravelly areas **Elevation:** 0–300 m. **Bioregional distribution:** Sonoran Desert **Distribution outside California:** Arizona, nw Mexico **Flowering time:** Jan–May
Astragalus lentiginosus var.*coachellae* (Coachella Valley milk-vetch) Fabaceae FE CNPS List 1B.2		Perennial (sometimes flowering first year or annual), moderately leafy, ± glabrous to silvery-strigose **Leaf** 1–15 cm; leaflets linear to widely ± ovate **Inflorescence**: flowers 3–± 50, ascending or spreading **Flower**: petals purplish, cream, whitish, or mixed purplish and whitish, keel 0.65–0.8 X banner, banner recurved 30–50° **Fruit** ovoid or spheric, widely grooved above and below, generally ± bladdery, ± papery, deciduous; beak generally triangular, flat; chambers 2 below beak **Ecology:** Generally dry, open places **Elevation:** -30–3600 m. **Bioregional distribution:** Riverside **Flowering time:** Feb-May

Solar Millennium Blythe/Palen Sensitive Plant Species List

Name	Picture	Description
Caliandra eriophylla (Fairyduster) Fabaceae CNPS List 2.3		Low Shrub < 30 cm; branches many, spreading from base **Leaves** deciduous; 1° leaflets generally 2–4 pairs; 2° leaflets generally 7–9 pairs, ± 2–3.5 mm **Flower** reddish purple; stamens 18–22 mm **Fruit** 5 cm, flat **Ecology:** Sandy washes, slopes, mesas **Elevation:** ± 1500 m. **Bioregional distribution:** Sonoran Desert; San Diego, Riverside and San Bernardino, Imperial counties, AZ, Baja Cal. Mex. **Distribution outside California:** Arizona, n Mexico **Flowering time:** Mar–Apr
Calochortus striatus (Alkali mariposa lily) Liliaceae CNPS List 1B.2		**Life form:** bulbiferous herb **Stem** 1–5 cm; bulblets 0 **Leaves**: basal 10–20 cm, generally withering **Inflorescence** ± umbel-like; flowers 1–5, erect; bracts 1–3 cm **Flower**: perianth bell-shaped, base narrowed; sepals 10–20 mm; petals 20–30 mm, irregularly toothed above, white to lavender, purple-veined, sparsely hairy near nectary, nectary not depressed, oblong, densely simple-hairy **Fruit** erect, 4–5 cm, linear, angled **Ecology:** Alkaline meadows, moist creosote-bush scrub **Elevation:** 800–1400 m. **Bioregional distribution:** w Mojave Desert **Distribution outside California:** w Nevada **Flowering time:** Apr–Jun Threatened by grazing, urbanization

Solar Millennium Blythe/Palen Sensitive Plant Species List

Name	Picture	Description
Castela emoryi (Crucifix thorn) Simaroubaceae (Quassia family) CNPS List 2.3		**Life form:** Shrub or small tree, appearing ± leafless, dioecious; thorns large, branched **Leaf** simple, sometimes scale-like **Flower**: calyx lobes 4–8; petals 4–8; stamens 8–24; ovaries 4–8, adherent near middle, style bases fused, tips spreading **Fruit**: drupe, dry, 4–8 per flower, spreading **Ecology** Mojave-Sonora Desert Scrub, playas **Elevation** 90-670 m **Distribution** Imperial, Riverside, San Bernardino Counties, Arizona, Sonora Mexico **Flowering time:** April-July

Solar Millennium Blythe/Palen Sensitive Plant Species List

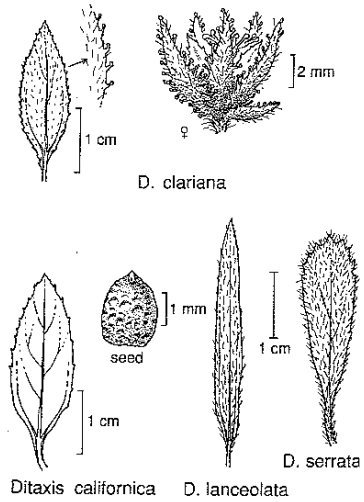
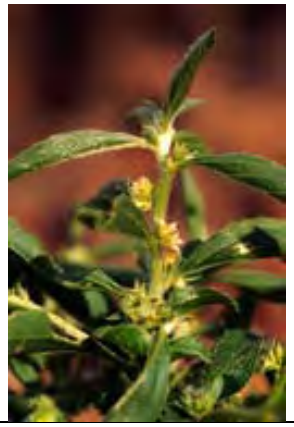
Name	Picture	Description
Colubrina californica (Las Animas colubrina) Rhamnaceae CNPS List 2.3		**Life form:** Tree, shrub **Stem**: branches opposite and alternate, rigid; twigs spreading, thorn-tipped or not, generally hairy **Leaves** in part clustered on short-shoots, evergreen or deciduous; stipules deciduous; blade 3–5-ribbed from base, entire but generally with round, marginal glands **Inflorescence** umbel-like, few-flowered; axis sometimes thorn-tipped **Flower**: hypanthium filled with nectar in flower, lower part adhering to developing fruit, upper deciduous; sepals 5; petals 5, oblanceolate, = sepals; stamens 5; ovary chambers 3, each 1-ovuled, styles 3 **Fruit**: capsule, shallowly 3-valved **Ecology** Mohave Desert- Sonoran Desert Scrub **Elevation** 10-1000 m **Distribution** Imperial, Riverside, San Diego Counties, Baja Ca Mexico, Arizona **Flowering time:** April-June

Solar Millennium Blythe/Palen Sensitive Plant Species List

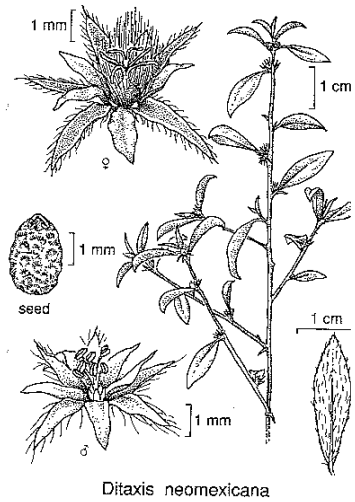
Name	Picture	Description
Coryphantha alversoni (Foxtail cactus) Cactaceae CNPS List 4.3		**Life form:** stem succulent **Stem** Simple, 2-5 branched at base, globose or short cylindrical, 5-8 inches high. Fls purplish, fruit oblong, sparsely spinose, seeds brown, flattish, minutely pitted **Ecology** Sandy or rocky granitic soil **Elevation** 75- 1525 m **Bioregional Distribution** Mojave and Sonoran desert scrub; Ivanpah and Riverside Mts., lower Colorado River **Flowering time** April-June

Name	Picture	Description
Cryptantha holoptera (Winged cryptantha) Boraginaceae CNPS List 4		Annual (perennial herb), 10–50 cm **Stem** generally branched throughout, strigose and bristly; bristles spreading to ascending, some bulbous-based **Leaf** 1–3.5(5) cm, linear, narrowly lanceolate, or oblong, short-bristly; bristles spreading **Inflorescence** generally dense in fruit; lowest flowers not touching **Flower**: sepals < or = 2 mm, 2.5–3(4) mm and linear-oblong in fruit, densely bristly to rough-hairy, hairs spreading; corolla limb 1–2 mm wide **Fruit**: nutlets 4, ± 1–2 mm, subequal, ovate to triangular, back and generally inner face sparsely tubercled, margin generally narrowly winged, groove opened widely below middle, edge generally elevated **Ecology:** UNCOMMON. Sandy to rocky soils **Elevation:** 100–1200 m. **Bioregional distribution:** e Mojave Desert, Sonoran Desert **Distribution outside California:** w Nevada, Arizona **Flowering time:** Mar–Apr **Synonyms:** C. inaequata I.M. Johnst

Solar Millennium Blythe/Palen Sensitive Plant Species List

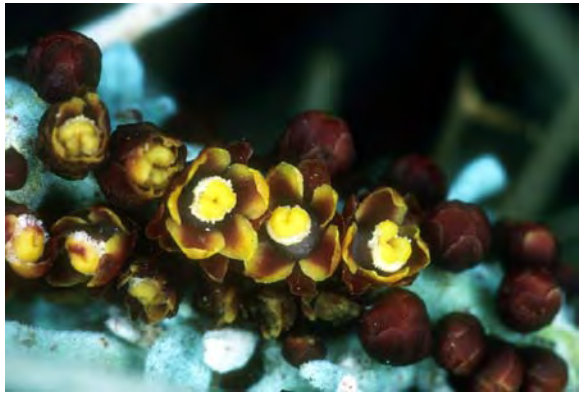
Name	Picture	Description
Cynanchum utahense (Utah cynanchum, Vine milkweed) Asclepiadaceae CNPS List 4.3 Observed in washes on Blythe site		**Life form:** Perennial, herbaceous shrub **Stem** slender, much-branched, < 1 m **Leaf**: blade 1.5–4 cm, linear, becoming reflexed **Inflorescence** umbel-like **Flower**: corolla 1.5–3 mm, bell-shaped, lobes incurved, hood-like, yellow, becoming orange **Fruit** 4–6 cm, with fine longitudinal grooves **Ecology:** UNCOMMON. Dry, sandy or gravelly areas **Elevation:** < 1000 m. **Bioregional distribution:** Mojave Desert **Distribution outside California:** to Utah, Arizona **Flowering time:** Apr–Jun
Ditaxis claryana (Glandular ditaxis) Euphorbiaceae CNPS List 2 .2	 	**Life form:** Annual or perennial herb **Stem** 1–5 dm; some hairs simple and spreading, others 2-forked and appressed **Leaf** 1–4 cm; stipules 1.5–3 mm, gland-toothed; blade lanceolate, lower surface hairy, margin finely gland-toothed **Staminate flower**: sepals 3.5–5 mm, hairy; petals ± = sepals, glabrous or hairy; stamen column 1.5–2 mm **Pistillate flower**: sepals 3.5–5.5 mm, unequal, glabrous or hairy; petals ± = sepals; ovary sparsely hairy, styles fused below, lobe tips expanded **Fruit** ± 4.5 mm **Seed** ± 2 mm, angled, faintly pitted **Ecology:** Sandy soils, creosote-bush scrub **Elevation:** < 100 m. **Bioregional distribution:** Sonoran Desert (Coachella Valley) **Flowering time:** Dec–Mar

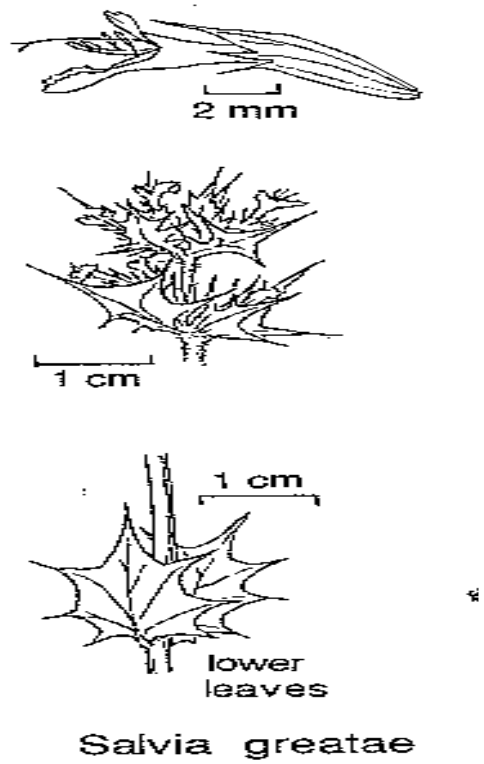
Solar Millennium Blythe/Palen Sensitive Plant Species List

Name	Picture	Description
Ditaxis serrata var. *californica* (California ditaxis) Euphorbiaceae CNPS List 3.2	 (Illus of D. neomexicana for general aspect)	**Life form:** Annual or perennial herb **Stem** 1–3.5 dm; appressed hairy **Leaf** 1–3 cm; stipules 1-1.5mm, margin toothed distally; blade widely elliptic-obovate, densely hairy, entire **Staminate flower**: sepals 2-2.5 mm, hairy; petals ± 2mm, glabrous; stamen column 1 mm **Pistillate flower**: sepals 3-4 mm, back hairy; petals ± 2.5mm;obovate, back appressed hairy, hairs exceeding petal tip; ovary stiff-hairy; styles free. **Fruit** ± 2 mm **Seed** ± 2 mm, rounded not clearly pitted **Ecology:** Sandy soils, creosote-bush scrub **Elevation:** < 200 m **Bioregional distribution:** Sonoran Desert (Coachella Valley) ; AZ, Mex. **Flowering time:** Dec–Mar

Solar Millennium Blythe/Palen Sensitive Plant Species List

Name	Picture	Description
Imperata brevifolia (California satintail) Poaceae CNPS List 2.2 Widespread Native that has a limited natural habitat, but becomes invasive (noxious weed) in wet areas.	 	**Life form:** Perennial with rhizomes **Stem** erect, solid in X -section **Leaves** cauline; ligule membranous, truncate; blade flat **Inflorescence** panicle-like, ± cylindric; branches appressed, many, short, spike-like, densely silky **Spikelets** in pairs, stalked, ± round in X -section, breaking below glumes, falling as 1 unit; glumes unequal, lower < upper, thinly membranous; florets 2, lower vestigial, obscure, upper bisexual, < glumes; lemma reduced, transparent or 0, awn 0; palea << lemma, ± vestigial; stamens 1–2; style exserted, stigmas plumose **Ecology** Moist places in springs, meadows, flood plains in coastal sage, chaparral and desert scrub; invasive in irrigation ditches, canals. **Elevation <500m** **Distribution** San Joachin Vy, South Coast, San Bernardino, Mojave Desert, TX, n Mex. **Flowering time: Sept –May**

Name	Picture	Description
Pilostyles thurberi (Thurber's pilostyles) Rafflesiaceae CNPS List 4		**Flower** < 2 mm, brown or maroon; bracts 4–7, 1–1.5 mm, overlapping, round or ovate; sepals like bracts; disk < 1 mm diam; stamens in ring of ± 3 rows **Ecology:** UNCOMMON. Open desert scrub **Elevation:** 0–300 m. **Bioregional distribution:** s Sonoran Desert (Riverside, San Diego, Imperial cos.) **Distribution outside California:** to Nevada, Arizona, Texas, Mexico **Flowering time:** Jan Parasitic on *Psorothamnus* , especially *P. emoryi*.

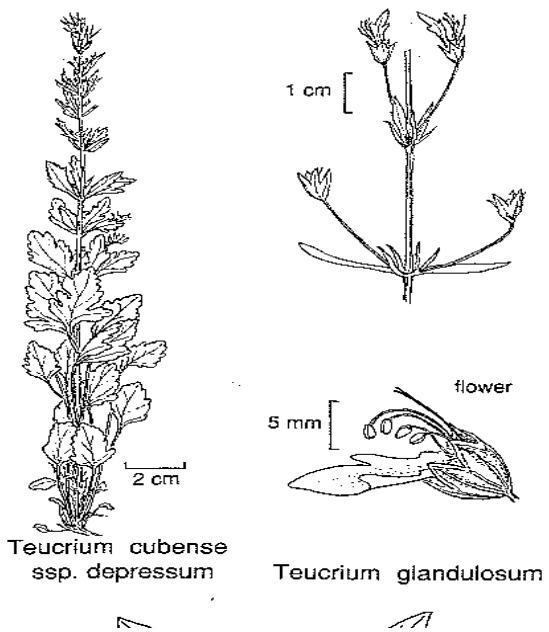
Name	Picture	Description
Salvia greatae (Orocopia sage) Lamiaceae CNPS List 1B.3		**Life form:** Shrub, < 1 m; hairs glandular, tangled **Leaf** 9–20 mm, ± ovate, sessile or short-petioled, green-tomentose, persistent; spines 1 at tip, in 2–7 pairs on margins **Inflorescence**: clusters many-flowered **Flower**: calyx 9–11 mm, upper lip of 3 shallow, spine-tipped lobes; corolla tube 9–11 mm, lavender to rose, upper lip 2-lobed, 2–2.5 mm, lower lip 4–5 mm; mature stamens and style exserted **Fruit**: nutlet, 2–3 mm, flat, keeled, gray to brown **Chromosomes:** 2*n*=±30 **Ecology:** Alluvial slopes **Elevation:** 30–240 m. **Bioregional distribution:** se Sonoran Desert (Orocopia, Chocolate mtns) **Flowering time:** Mar–Apr

Solar Millennium Blythe/Palen Sensitive Plant Species List

Name	Picture	Description
Selaginella eremophila (Desert spikemoss) Selaginellaceae CNPS List 2.2		**Life form:** rhizomatous herb; plant mat-like, dense **Stems** prostrate to spreading; main stems 5–14 cm; lateral branches < 1 cm, ascending **Leaves** decurrent; upper and lower leaves of main stems unequal (lower 1.5–3 mm, upper ± 1.5 mm), ± lanceolate, marginal hairs spreading; young leaves bristle-tipped, bristle < 1 mm, soft, twisted, deciduous; mature tip generally acute **Cone** 3–10 mm; leaves ovate to deltate; large spores yellow **Ecology:** UNCOMMON. Shaded sites, gravelly soils, crevices, among rocks **Elevation:** < 900 m. **Bioregional distribution:** e Peninsular Ranges, Sonoran Desert **Distribution outside California:** to Texas, Baja California **Flowering time:** May-July

Solar Millennium Blythe/Palen Sensitive Plant Species List

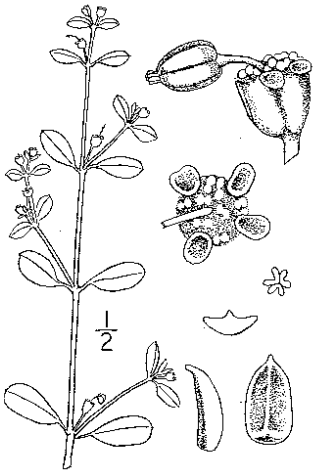
Name	Picture	Description
Senna covesii (Coves' cassia) Fabaceae CNPS List 2.2		Subshrub, unarmed, leafy, densely white-hairy **Stem** 3–6 dm **Leaf**: stipules bristle-like, some persistent; leaflets 2–3 pairs, overlapped, opposite, short-stalked, 1–2.5 cm, elliptic **Inflorescence**: raceme, axillary, 5–15 mm, few-flowered **Flower**: petals ± 12 mm, oblong-obovate, prominently veined **Fruit** dehiscent, 2–5 cm, oblong, ± straight **Seeds** several **Ecology:** Dry, sandy desert washes, slopes **Elevation:** 500–600 m. **Bioregional distribution:** Sonoran Desert **Distribution outside California:** Nevada, Arizona, Baja California **Flowering time:** Apr **Synonyms:** Cassia c. A. Gray
Tetracoccus hallii (Hall's tetracoccus) Euphorbiaceae CNPS List 4		**Stem**: twigs sparsely short-strigose, becoming glabrous **Leaves** generally alternate, generally clustered on short, lateral twigs; blade 2–12 mm, oblanceolate to obovate, tip obtuse to rounded, margin entire **Staminate inflorescence**: cyme; flowers generally 1–5, generally clustered on short, lateral twigs; pedicel 3–5.5 mm **Staminate flower**: sepals 4–6, ± round; stamens 4–8, filaments 1.5–2.5 mm, glabrous **Pistillate flower**: pedicel 0.5–1(3) mm; sepals generally 5, 2–5 mm, ovate to deltate; ovary densely and finely gray-tomentose, chambers generally 3, sometimes 2 or 4, style 1.5–2 mm **Fruit** 8–12 mm, 6–10 mm wide, finely tomentose **Ecology:** Rocky slopes, washes **Elevation:** < 1200 m. **Bioregional distribution:** se Mojave Desert, Sonoran Desert **Distribution outside California:** w Arizona

Name	Picture	Description
Teucrium cubense ssp. *depressum* (Dwarf germander) Lamiaceae CNPS List 2.2		**Life form:** annual herb **Stem** simple to branched at base **Leaf** generally withering in fruit; lower 2–4 cm, blade ovate to obovate, crenate to lobed; upper 0.5–1.5 cm, generally deeply 3-lobed **Inflorescence**: pedicel 1–5 mm **Flower**: calyx tube 1–3 mm, lobes 3–6 mm, bristle-tipped; corolla 7–15 mm, slightly puberulent inside, white to bluish, purple-spotted; filament glabrous **Ecology:** Sandy soils, washes, fields **Elevation:** < 400 m. **Bioregional distribution:** Sonoran Desert **Distribution outside California:** to Texas, Baja California **Flowering time:** Mar–May **Ecology** Rocky slopes, canyons **Elevation** 400-500 m **Distribution** ne Sonoran Desert, AZ, Baja Ca. Mex.

Solar Millennium Blythe/Palen Sensitive Plant Species List

Name	Picture	Description
Wislizenia refracta ssp. Refracta (Jackass clover) Capparaceae CNPS List 2.2		**Life form:** Annual or perennial herb, glabrous to puberulent **Stem** profusely branched from base, 0.5–24 dm **Leaf**: petiole 3–25 mm; leaflets generally 3 **Inflorescence**: raceme, 1–3 cm, dense, terminal, in fruit 4–20 cm; pedicels 5–10 mm **Flower** radial; sepals free, ± 2 mm, ± entire, green; petals 2.5–6.3 mm, elliptic, yellow, ± sessile but tapered to base; stamens 8–14 mm, yellow; ovary 0.3–0.6 mm, generally exserted, lobes 2, nearly separate, each generally 1-ovuled, style 2–5.5 mm **Fruit**: nutlets 2; valves deciduous; receptacle stalk-like, reflexed; style elongate but not spine-like **Seeds** generally 1 per nutlet **Ecology:** Desert washes and flats, fields, roadsides, especially alkaline soils **Elevation:** 0–800 m. **Bioregional distribution:** c&s Sierra Nevada Foothills, San Joaquin Valley, Desert **Distribution outside California:** to Texas, nw Mexico

Blythe-Palen – Sensitive Plant Species added to 2010 survey.

Harwood's woollystar (*Eriastrum sparsiflorum* ssp. *harwodii - now E. sparsiflorum was E.diffusum ssp.h. in Munz)* CNPS List 1B.2	Plant erect, canescent-lanate; fl pale blue-white, 7.5mm long, w apiculate lobes. Drifting sand East Mojave: Kelso, Dale Dry Lake (east of 29 Palms ~3000 ft) – only three vouchers unmapped © 1998 Larry	
Flat-seeded spurge (*Chamaesyce platysperma*) CNPS List 1B.2	Lf margin entire; seed flattened top to bottom, surface smooth; gland ovate Only four collections: Little Blair Vy, Coachella Vy (nr.Edom), Superstition Mt	

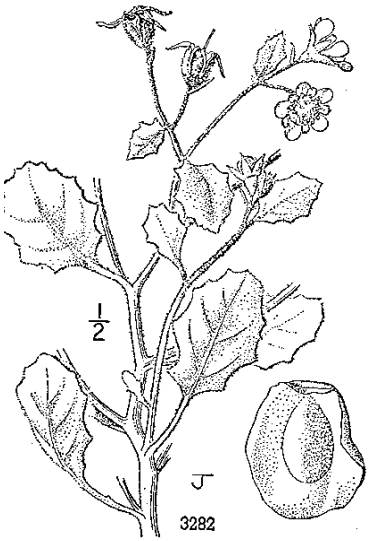
Blythe-Palen – Sensitive Plant Species added to 2010 survey.

Abram's spurge (*Chamaesyce abramsiana*) CNPS List 2.2	Plant hairy; seeds transversely ribbed Sandy flats, margin dry lakes, near spring (Van Winkle) 33.605556 / -114.979167 south side of Hwy I-10 along gasline road, 0.5-0.75 mi. east of Ford Lake Rd. exit, c. 22 miles west of Blythe Blair Valley, Ocotillo (BLM Crusifixtion Thorn Preserve)	
Bitter hymenoxys (*Hymenoxys odorata*) CNPS List 2	Annual , basal lvs (0) at flowering, rays yellow, invol dia 5-7 mm, TOXIC range plant Sand flats, alkali soil	

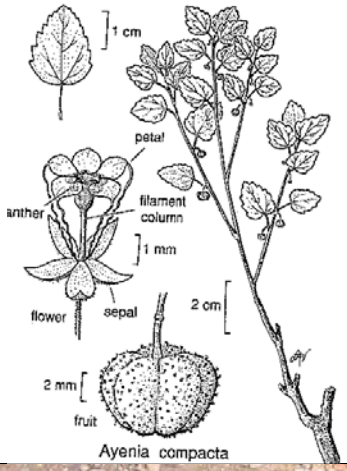
Blythe-Palen – Sensitive Plant Species added to 2010 survey.

Lobed ground cherry (*Physalis lobata*) CNPS List 2.3 NECO	Perennial; fl. Purple, inside tube white; Dry mud, playas, alkaline lake (with: Sphaeralcea, Castela, Lupinus) Clark's Pass (So. End of Sheep Hole Mts., ~2 km SE of Hwy 62 Clarks Pass © 2008 Steve Matson x	
Small-flowered androstephium (*Androstephium breviflorum*) CNPS List 2.2	Perennial herb from corm; tepals white with green or pinkish midrib Bajadas, sandy flats and dune fields; with Larrea, Pleuraphis, Amsinkia, Amdu Southwest of Sleeping Beauty Mt, S. end cady Mts (NW of Ludlow), Whipple Mts. (OHV area)	
Spearleaf (*Matelea parvifolia*) CNPS List 2.3 NECO	Perennial vining herb Mojave and Sonoran scrub, granitic dry wash, rocky areas 440-2000 m elev So. Side Chuckwalla Mts. (on Bradshaw Road c. 2 mi east of gasline road); Sheep Hole Pass, 100 meters west of Amboy Road. Near 34°14'30"N, 115°43'30"W, T2N © 2005 Aaron Schusteff	

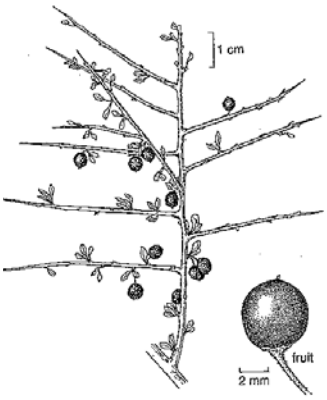
Blythe-Palen – Sensitive Plant Species added to 2010 survey.

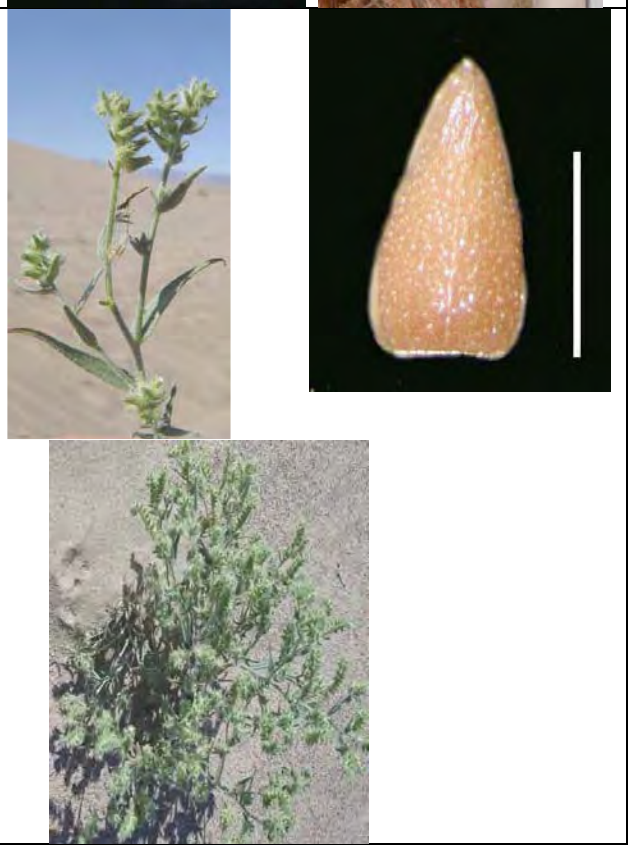
Argus blazing star (*Mentzelia puberula*) CNPS List 2	Perennial herb (plants with non-clasping lvs.), sepals narrowly lanceolate 6-8 mm; minor variant of Mentzelia oreophila Sandy crevices in cliffs, rocky slopes. Limestone and granite with mesic veg Kane Springs, Ord Mts, Sheephole Mts., spring in Avawatz Mts. and 4 mi. NW of Avawatz Pass & 0.5 mi. west of Arrastre Spring, at end of road.;"Santa Marie Mts (Big Maria or Little?)	
	Per 15–54 cm. **ST:** erect, hairy. **LF:** 2–6.5 cm, 10–40 mm wide, lower wide-obovate to elliptic or wide-elliptic, toothed, upper sessile, ovate to broadly elliptic, base not clasping. **INFL:** bracts linear, entire, green. **FL:** sepals 5–9 mm; petals 7–14 mm, 2–6 mm wide, yellow, tip obtuse; stamens 3–12 mm, filaments of 5 outermost 5–12 mm, 1.5–3 mm wide, oblanceolate, tip irregularly cut, round to acute, with anther; style 4–7 mm. **FR:** erect, 5–10 mm, 5–7 mm wide, cup-shaped. **SEED:** ± 3 mm, ± 2 mm wide, lenticular, winged, white. Sandy crevices in cliffs or rocky slopes; 90–1280 m. e DSon, se DMoj; to AZ, Mex. Mar–May (Jeps 2nd	
California ayenia (*Ayenia compacta*) CNPS List 2.3	Perennial subshrub Granite rocks, cliffs, gravelly cyn bottom Chuckwalla Mts. © 2002 John Game	

Blythe-Palen – Sensitive Plant Species added to 2010 survey.

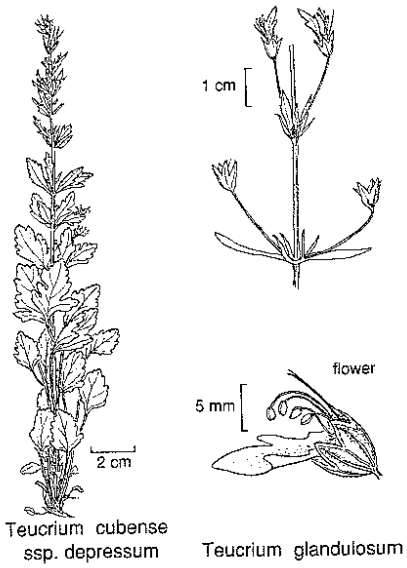
		
Desert unicorn plant (*Proboscidea althaeifolia*) CNPS List 4.3	Distinguished from P. parviflora by: smaller lvs. (3-7 cm);corolla yellow w maroon flecks; fragrant;fr.body ± 1 cm thick (not 2-3cm);taproot wider than stem base. Sandy places, washes. Blooms Apr-Sep	
Pink velvet mallow (*Horsfordia alata*) CNPS List 4.3	Perennial herb; Fr of 10-12 segments (not a capsule), herbage with yellow pubescence fls. pale pink Washes, plains; with Olneya, Acacia g, Amdu, Larrea; Granite boulders and granitic sand with Fouq spl, Psor sch, Acacia, Agave d. 10.9 mi. south of Hwy 78 on Ogilby Road.l, Vallecito Vy, washes of Santa Rosa Mts.	

Blythe-Palen – Sensitive Plant Species added to 2010 survey.

Desert portulaca (*Portulaca halimoides*) CNPS List 4.2	Fleshy annual; lf axils, involucre with many long hairs (8mm), Blooms Sept Rocky ridge with Larrea t, Psor e, Fouqueria spl, Gilia latifolia, Chaenactis carph, Langloisia set ssp. p; Joshua T Wd (sandy); Clark Mt Rocky limestone slope, wsw-facing, with Sanvitalia ab, Chamae revol, Ericam lar, Agave u. 1000-1400 m elev.	
Bitter snakewood (*Condalia globosa* var. *pubescens*) CNPS List 4.2 NECO	Perennial spiny shrub (Lycium-like) Margins of washes Rd from Palo Verde to Ogilby, Along 78: 1.5 mi n of Midway Well; on the road from Blythe s to the hwys 80 and 98; Chuckwalla Bench w of C Mts: Creosote bush scrub with Ziz ob, Salaz m, Acacia g, Fouq spl, etc.relativly flat alluvial plain of granitic sand cut by numerous small washes.	 Condalia globosa var. pubescens
Winged cryptantha (*Cryptantha holoptera*) CNPS List 4.3 NECO	Annual herb;plant taller than wide;taproot usually not red or purple when dry;at least one nutlet roughened, papillate, tuberculate, and/or muricate (enlarged, radially bumps); nutlet margin sharp-angled and flattened into a narrow rim to a broad wing;pedicels 1-4 mm long; annual or per.;nutlets of fruit similar, dorsally papillate-tuberculate, margin with narrow, flattened rim or wing; pl usu. Annual with major central axis; inflor in fr dense. © 2006 Heath McAllister	

Ribbed cryptantha (*Cryptantha costata*) C NPS List 4.3	Annual herb; plant taller than wide;taproot usually not red or purple when dry;at least one nutlet roughened, papillate, tuberculate, and/or muricate (enlarged, radially bumps); nutlet margin sharp-angled and flattened into a narrow rim to a broad wing,pedicel < 1mm, 4 similar nutlets per fr, nutlets papillate, narrowly winged, dorsal surface finely papillate;fls bracteate (deciduous). Sand dunes Algodones, Bristol Lake, Dumont and Cadiz dunes often on the margins of dry lakes; Coachella Vy.; widespread in Calif. Deserts Imperial to Inyo County, AZ, Baja Mexico.	

Blythe-Palen – Sensitive Plant Species added to 2010 survey.

Glandular or sticky germander (*Teucrium glandulosum*) [T. cubense ssp. depressum in earlier guide] CNPS List 2.3	Perennial (T. c.d. is annual); stoloniferous ;much branched; pedicels >> 5mm; corolla lip>>8mm, white gen. with violet streaks. Rocky slopes, canyons Calif. Pops. all at Whipple Mts. on the south side of Copper Basin(~ 50 mi. nw of Blythe), AZ, Baja Mexico.	
Orcutt's woody-aster (*Xylorhiza orcuttii*) CNPS List 1B.2 BLM Sensitive	Perennial "shrub"; peduncles 0-11 cm; younger sts/peduncles glabrous; phyllaries tightly appressed glabrous, inner-most phyllaries Sonoran scrub, Riverside to SD County, Baja Mexico	

ATTACHMENT 5

FLORAL SPECIES OBSERVED

Attachment 5
Floral Species Observed

Note: the "Status" column in this table denotes both special status and nonnative plant species. Special status plant species are indicated by the appropriate California Native Plant Society (CNPS) Listing Status and are shown in bold text. Nonnative plant species are indicated wherever "*nonnative" appears in the Status column. A blank Status field corresponds to a native plant species with no special status.

Status	Scientific Name	Common Name
Gnetales		
Ephedraceae - Ephedra Family		
	Ephedra sp.	ephedra
Monocots		
Lilliaceae - Lily Family		
	Hesperocallis undulata	desert lily
Poaceae - Grass Family		
	Aristida adscensionis	sixweeks threeawn
	Aristida californica var. *californica*	California threeawn
	Aristida purpurea	purple threeawn
	Bouteloua barbata var. *barbata*	sixweeks grama
*nonnative	*Bromus madritensis* ssp. *rubens*	red brome, foxtail chess
*nonnative	*Cynodon dactylon*	Bermuda grass
	Erioneuron pulchellum	fluff grass
*nonnative	*Hordeum* sp.	barley
	Pleuraphis rigida	big galleta grass
*nonnative	*Schismus arabicus*	Mediterranean grass
*nonnative	*Vulpia bromoides*	brome fescue
	Vulpia octoflora	sixweeks fescue
Eudicots		
Asclepiadaceae - Milkweed Family		
	Asclepias subulata	rush milkweed
CNPS 4.3	***Cynanchum utahense***	**Utah milkvine**
	Sarcostemma cynanchoides ssp. *hartwegii*	climbing milkweed
	Sarcostemma hirtellum	trailing townula, hairy milkweed
Asteraceae - Sunflower Family		
	Adenophyllum porophylloides	San Felipe dyssodia
	Ambrosia dumosa	burroweed, white bursage
	Atrichoseris platyphylla	parachute plant, gravel ghost
	Baileya pauciradiata	desert-marigold

Status	Scientific Name	Common Name
	Bebbia juncea var. *aspera*	sweetbush
	Calycoseris parryi	yellow tackstem
	Calycoseris wrightii	white tackstem
	Chaenactis carphoclinia	pebble pincushion
	Chaenactis stevioides	desert pincushion
	Dicoria canescens	dicoria
	Encelia farinosa	brittlebush, incienso
	Encelia frutescens	button brittlebush
	Geraea canescens	desert-sunflower
	Hymenoclea salsola	cheesebush
*nonnative	*Lactuca serriola*	prickly lettuce
	Malacothrix glabrata	desert dandelion
	Monoptilon bellioides	Mojave desertstar
	Palafoxia arida var. *arida*	Spanish needle
	Pectis papposa	chinchweed
	Perityle emoryi	Emory’s rockdaisy
	Porophyllum gracile	odora
	Prenanthella exigua	brightwhite
	Psathyrotes ramosissima	turtleback
	Rafinesquia neomexicana	desert chicory
	Senecio mohavensis	Mojave ragwort, Mohave Groundsel
	Sonchus oleraceus	sow thistle
	Stephanomeria pauciflora var. *pauciflora*	wire lettuce
	Stephanomeria exigua	wire lettuce
	Stylocline gnaphaloides	nest straw
	Trichoptilium incisum	yellowhead, yellowdome
	Trixis californica var. *californica*	American threefold
Boraginaceae - Borage Family		
	Amsinckia menziesii var. *intermedia*	common fiddleneck
	Amsinckia tesselata	devil's lettuce
	Cryptantha angustifolia	narrow leaved cryptantha
	Cryptantha barbigera	bearded cryptantha
CNPS 4.3	***Cryptantha costata***	**ribbed cryptantha**
CNPS 4.3	***Cryptantha holoptera***	**winged cryptantha**
	Cryptantha maritima	Guadalupe cryptantha
	Cryptantha micrantha	redroot cryptantha
	Cryptantha nevadensis	Nevada cryptantha
	Cryptantha pterocarya var. *cycloptera*	wingnut cryptantha
	Pectocarya heterocarpa	combseed

Status	Scientific Name	Common Name
	Pectocarya platycarpa	broadfruit combseed
	Pectocarya recurvata	curvenut combseed
	Plagiobothrys jonesii	popcornflower
	Tiquilia plicata	fanleaf crinklemat, plicate coldenia
Brassicaceae - Mustard Family		
*nonnative	*Brassica tournefortii*	Saharan mustard, Sahara mustard
	Descurania pinnata	yellow tansy mustard
	Dithyrea californica	spectacle-pod
	Guillenia lasiophyllum	California mustard
	Lepidium lasiocarpum	pepperweed
*nonnative	*Sisymbrium irio*	London rocket
	Streptanthella longirostris	streptanthella
	Tropidocarpum gracile	dobie pod
Cactaceae - Cactus Family		
BLM Sensitive	***Echinocactus polycephalus* var. *polycephalus***	**cottontop cactus, clustered barrel cactus**
BLM Sensitive	***Ferocactus cylindraceus* var. *cylindraceus***	**California barrel cactus**
	Mammillaria tetrancistra	common fishhook cactus
	Opuntia basilaris	beavertail cactus
	Opuntia echinocarpa	silver cholla, golden cholla
	Opuntia ramosissima	pencil cactus, diamond cholla
Campanulaceae - Bellflower Family		
	Nemacladus glanduliferus var. *glanduliferus*	glandular threadplant
Caryophyllaceae - Pink Family		
	Achyronychia cooperi	onyx flower
Chenopodiaceae - Goosefoot Family		
	Atriplex hymenelytra	desert holly
	Atriplex polycarpa	allscale saltbrush
*nonnative	*Chenopodium murale*	nettleleaf goosefoot
*nonnative	*Salsola tragus*	Russian thistle, tumbleweed
Cucurbitaceae - Gourd Family		
	Brandegea bigelovii	desert starvine
Euphorbiaceae - Spurge Family		
	Chamaesyce polycarpa	smallseed sandmat
	Ditaxis lanceolata	narrowleaf ditaxis, narrowleaf silverbush
	Ditaxis neomexicana	New Mexico ditaxis
	Euphorbia eriantha	beetle spurge
	Stillingia spinulosa	broad leaved stillingia

Status	Scientific Name	Common Name
Fabaceae - Legume Family		
	Acacia gregii	catclaw
	Astragalus aridus	annual desert milkvetch
	Astragalus didymocarpus	two-seeded milkvetch
CNPS 2.2	***Astragalus insularis* var. *harwoodii***	**Harwood's milkvetch**
	Astragalus nuttallianus var. *imperfectus*	turkey peas
	Cercidium floridium ssp. *floridium*	blue palo verde
	Dalea mollis	silky dalea, hairy prairie clover
	Dalea mollisima	silky dalea
	Lotus strigosus var. *tomentellus*	strigose lotus
	Lotus wrangelianus	Chilean bird's-foot trefoil
	Lupinus arizonicus	Arizona lupine
	Marina parryi	Parry's false prairie clover
*nonnative	*Melilotus indica*	sour clover
	Olneya tesota	ironwood
	Prosopis glandulosa	honey mesquite
	Psorothamnus emoryi	dye bush
	Psorothamnus spinosus	smoke tree
	Senna armata	spiny senna, desert senna
Fouquieriaceae - Ocotillo Family		
	Fouquieria splendens ssp. *splendens*	ocotillo
Geraniaceae - Geranium Family		
	Erodium texanum	Texas storksbill, Desert Heron's Bill
Hydrophyllaceae - Waterleaf Family		
	Eucrypta micrantha	dainty desert hideseed
	Nama demissum var. *demissum*	purplemat
	Nama hispidum var. *spathulatum*	small leaved nama
	Phacelia crenulata var. *ambigua*	purplestem phacelia
	Phacelia crenulata var. *minutiflora*	cleftleaf wildheliotrope
	Phacelia neglecta	alkali phacelia
Krameriaceae - Rhatany Family		
	Krameria erecta	Pima rharany, littleleaf ratany
	Krameria grayi	white rhatany
Lamiaceae - Mint Family		
	Hyptis emoryi	desert-lavender
Loasaceae - Loasa Family		
	Mentzelia albicaulis	small flowered blazing star, white stemmed stickleaf
	Mentzelia involucrata	whitebract blazingstar

Status	Scientific Name	Common Name
Malvaceae - Mallow Family		
	Eremalche exilis	white mallow
	Eremalche rotundifolia	desert five-spot
	Hibiscus denudatus	paleface
	Sphaeralcea ambigua	desert globemallow, apricot mallow
Martyniaceae - Unicorn-Plant Family		
CNPS 4.3	***Proboscidea althaeifolia***	**desert unicorn**
Nyctaginaceae - Four O'Clock Family		
	Abronia villosa var. *villosa*	sand verbena
	Allionia incarnata	trailing allionia, windmills
Onagraceae - Evening Primerose Family		
	Camissonia boothii ssp. *desertorum*	desert suncup
	Camissonia brevipes ssp. *brevipes*	golden suncup
	Camissonia cardiophylla	heartleaf suncup
	Camissonia claviformis	browneyes
	Camissonia claviformis x brevipes	suncup
	Camissonia refracta	narrowleaf suncup
	Oenothera deltoides ssp. *deltoides*	devil's lantern
	Oenothera primiveris ssp. *bufonius*	desert evening primrose
Papaveraceae - Poppy Family		
	Eschscholzia glyptosperma	desert poppy, desert golden poppy
	Eschscholzia minutiflora	pygmy poppy, Coville’s poppy
	Eschscholzia parishii	Parish’s poppy
Plantaginaceae - Plantain Family		
	Plantago ovata	desert Indianwheat, woolly plantain
Polemoniaceae - Phlox Family		
CNPS 1B.2	***Eriastrum harwoodii***	**Harwood's woollystar**
	Eriastrum sparsiflorum	Great Basin woollystar
	Gilia brecciarum ssp. *brecciarum*	Nevada gilia
	Gilia latifolia	broadleaf gilia
	Gilia stellata	star gilia
	Langloisia setosissima ssp. *setosissima*	bristly langloisia
	Linanthus jonesii	Jones’ linanthus
	Loeseliastrum schottii	Schott's calico
Polygonaceae - Buckwheat Family		
	Chorizanthe brevicornu var. brevicornu	brittle spineflower
	Chorizanthe corrugata	wrinkled spineflower
	Chorizanthe rigida	spiny-herb
	Eriogonum inflatum	desert trumpet

Status	Scientific Name	Common Name
	Eriogonum reniforme	kidneyleaf buckwheat
	Eriogonum thomasii	Thomas Eriogonum
	Eriogonum trichopes	little deserttrumpet
Resedaceae - Mignonette Family		
	Oligomeris linifolia	lineleaf whitepuff
Rhamnaceae - Buckthorn Family		
CNPS 2.3	***Colubrina californica***	**Las Animas colubrina**
	Ziziphus obtusifolia var. canescens	graythorn
Scrophulariaceae - Figwort Family		
	Antirrhinum filipes	twining snapdragon
	Mohavea confertiflora	ghost flower
Solanaceae - Nightshade Family		
	Lycium andersonii	water jacket, Anderson's desert thorn
	Nicotiana clevelandii	tobacco
	Physalis hederifolia var. *fendleri*	Fendler’s groundcherry
Tamaricaceae - Tamarisk Family		
*nonnative	*Tamarix* sp.	Tamarisk
Viscaceae - Mistletoe Family		
	Phoradendron californicum	desert mistletoe
Zygophyllaceae - Caltrop Family		
	Fagonia laevis	California fagonbush
	Kallstroemia parviflora	warty caltrop
	Larrea tridentata	creosote bush

ATTACHMENT 6

REPRESENTATIVE PHOTOGRAPHS OF VEGETATION COMMUNITIES WITHIN THE COMBINED SURVEY AREA

Photograph 1: Unvegetated ephemeral dry wash, with interspersed creosote bush – big galleta association (view looking west).

Photograph 2: Desert dry wash woodland. Blue palo verde, and creosote bush in western part of the Combined Survey Area (view looking east).

Map Location

Blythe Solar Power Project
Biological Technical Report

Attachment A6-1
Representative Vegetation Community
Photographs 1 and 2

AECOM

Date: June 2010

Path: P:\2009\09080082 Sol Mil Blythe\5.0 Graphics (Non-CAD)\5.4 Proj_Graphics\Figures\Botanical Survey Report 2010\VegPhotos.doc, 5/19/2010, HarperK

Photograph 3: Sonoran Creosote Bush scrub in the background with desert pavement in foreground (view looking northeast).

Photograph 4: Stabilized and partially stabilized desert dunes. Sahara mustard, ribbed cryptantha, and scattered creosote bush in the substation area of the Combined Survey Area (view looking north).

Map Location

Blythe Solar Power Project
Biological Technical Report

Attachment A6-2
Representative Vegetation Community
Photographs 3 and 4

AECOM

Date: June 2010

Path: P:\2009\09080082 Sol Mil Blythe\5.0 Graphics (Non-CAD)\5.4 Proj_Graphics\Figures\Botanical Survey Report 2010\VegPhotos.doc, 5/19/2010, HarperK

ATTACHMENT 7

SCANNED DATA SHEETS

BLYTHE SOLAR POWER PROJECT

SPRING 2010 BOTANICAL SURVEYS

SCAN DETAILS

Surveyor	Sanders, Andrew
Scanned By	Harper, Kyle
Scan Date	05.17.2010

A. Sanders 15 Mar '10 BLYTHE

Family	Scientific Name	Common Name	Phenology(ies) D	V	B	F	Day(s) M	T	W	Th
		GNETALES								
Ephedraceae – Ephedta Family										
	Ephedra sp.	ephedra					—			
		MONOCOTS								
Poaceae – Grass Family										
	Aristida adscensionis	sixweeks threeawn					—			
	Aristida purpurea	purple threeawn					—			
	Bouteloua barbata var. *barbata*	sixweeks grama					—			
	Bromus madritensis ssp. *rubens**	red brome, foxtail chess					—			
	Erioneuron pulchellum (*syn. Dasyochloa pulchella*)	fluff grass					—			
	Pleuraphis rigida	big galleta grass		✓	✓		✓			
	Schismus ~~sp.~~ *arabicus*	Mediterranean grass			✓		✓			
	*Vulpia bromoides**	brome fescue					~~—~~			
	Vulpia octoflora	sixweeks fescue					—			
		DICOTS								
Asclepiadaceae – Milkweed Family										
	Asclepias subulata	rush milkweed		✓			✓			
	Cynanchum utahense	Utah cynanchum					—			
	Sarcostemma cynanchoides ssp. *hartwegii*	climbing milkweed					—			
	Sarcostemma hirtellum	trailing townula, hairy milkweed					—			
Asteraceae – Sunflower Family										
	Adenophyllum porophylloides	San Felipe dyssodia					—			
	Ambrosia dumosa	burroweed , white bursage		✓			✓			
	Atrichoseris platyphylla	parachute plant , gravel ghost					—			
	Bebbia juncea var. *aspera*	sweetbush					—			
	Calycoseris wrightii	white tackstem					—			
	Chaenactis carphoclinia	pebble pincushion		✓			✓			
	Chaenactis stevioides	desert pincushion		✓	✓		✓			
	Encelia farinosa	brittlebush, incienso					—			
	Encelia frutescens	button brittlebush					—			
	Geraea canescens	desert-sunflower		✓	✓		✓			
	Hymenoclea salsola	cheesebush					—			
	Malacothrix glabrata	desert dandelion					—			
	Monoptilon bellioides	Mojave desertstar					—			
	Palafoxia arida var. *arida*	Spanish needle, desert palafox		✓	✓		✓			
	Perityle emoryi	Emory's rockdaisy					—			
	Pectis papposa	chinchweed					—			
	Porophyllum gracile	odora					—			
	Prenanthella exigua	brightwhite					—			
	Rafinesquia neomexicana	desert chicory			✓		✓			
	Senecio mohavensis	Mojave ragwort, Mohave Groundsel					—			

Family	Scientific Name	Common Name	Phenology(ies)				Day(s)			
			D	V	B	F	M	T	W	Th
	Allionia incarnata	trailing allionia, windmills					✓			
Onagraceae – Evening Primrose Family										
	Camissonia boothii ssp. *desertorum*	desert suncup					✓			
	Camissonia brevipes ssp. *brevipes*	golden suncup					✓			
	Camissonia ~~cf.~~ OK *cardiophylla*	heartleaf suncup			✓		✓			
	Camissonia claviformis	browneyes			✓		✓			
	Camissonia refracta	narrowleaf suncup					✓			
Papaveraceae – Poppy Family										
	Eschscholzia glyptosperma	desert poppy , desert golden poppy					✓			
	Eschscholzia minutiflora	pygmy poppy, Coville's poppy					✓			
Plantaginaceae – Plantain Family										
	Plantago ovata	desert Indianwheat, woolly plantain		✓	✓		✓			
Polemoniaceae – Phlox Family										
	Gilia brecciarum ssp. *brecciarum*	Nevada gilia					✓			
	Gilia latifolia	broadleaf gilia					✓			
	Gilia stellata	star gilia					✓			
	Langloisia setosissima ssp. *setosissima*	bristly langloisia					✓			
	Linanthus jonesii	Jones' linanthus					✓			
	Loeseliastrum schottii	Schott's calico					✓			
Polygonaceae – Buckwheat Family										
	Chorizanthe brevicornu var. *brevicornu*	brittle spineflower		✓			✓			
	Chorizanthe corrugata	wrinkled spineflower					✓			
	Chorizanthe rigida	spiny-herb		✓			✓			
	Eriogonum inflatum	desert trumpet					✓			
	Eriogonum reniforme	kidneyleaf buckwheat					✓			
	Eriogonum thomasii	Thomas Eriogonum					✓			
	Eriogonum trichopes	little deserttrumpet					✓			
Resedaceae – Mignonette Family										
	Oligomeris linifolia	lineleaf whitepuff					✓			
Rhamnaceae – Buckthorn Family										
	Colubrina californica	las animas colubrina					✓			
	Ziziphus cf. *obtusifolia* var. *canescens*	graythorn					✓			
Scrophulariaceae – Figwort Family										
	Antirrhinum filipes	twining snapdragon					✓			
	Mohavea confertiflora	ghost flower					✓			
Solanaceae – Nightshade Family										
	Lycium andersonii	water jacket, Anderson's desert thorn					✓			
	Physalis hederifolia var. *fendleri*	Fendler's groundcherry					✓			

Family	Scientific Name	Common Name	Phenology(ies)				Day(s)			
			D	V	B	F	M	T	W	Th
Tamaricaceae – Tamarisk Family										
	Tamarx sp. *	Tamarisk					—			
Viscaceae – Mistletoe Family										
	Phoradendron californicum	desert mistletoe					—			
Zygophyllaceae – Caltrop Family										
	Fagonia laevis	California fagonbush					—			
	Larrea tridentata	creosote bush			✓		✓			
	Kallstroemia parviflora	warty caltrop					—			
RARE PLANT TARGET LIST										
	Acleisanthes longiflora	Angel trumpets					—			
	Androstephium breviflorum	small-flowered androstephium					—			
	Astragalus insularis var. harwoodii	Harwood's milkvetch			✓	✓	✓			
	Astragalus lentiginosus var. coachellae	Coachella Valley milkvetch					—			
	Ayenia compacta	California ayenia					—			
	Calliandra eriophylla	Fairyduster					—			
	Calochortus striatus	Alkali mariposa-lily					—			
	Castela emoryi	Crucifixion thorn					—			
	Chamaesyce abramsiana	Abram's spurge					—			
	Chamaesyce platysperma	Flat-seeded spurge					—			
	Colubrina californica	Las Animas colubrine					—			
	Condalia globosa var. pubescens	bitter snakewood					—			
	Corypantha alversonii	Foxtail cactus					—			
	Cryptantha costata	ribbed cryptantha			✓	✓	✓			
	Cryptantha holoptera	winged cryptantha					—			
	Cynanchum utahense	Utah milkvine					—			
	Ditaxis claryana	glandular ditaxis					—			
	Ditaxis serrata var. californica	California ditaxis					—			
	Echinocactus polycephalus var. polycephalus	cottontop cactus					—			
	Echinocereus engelmannii	hedgehog cactus					—			
	Echinocereus triglochidiatus	hedgehog cactus					—			
	Eriastrum harwoodii	Harwood's wollystar					—			
	Ferocactus cylindraceus	California barrel cactus					—			
	Horsfordia alata	pink velvet mallow					—			
	Hymenoxys odorata	bitter hymenoxys					—			
	Imperata brevifolia	California satintail					—			
	Matelea parvifolia	spearleaf					—			
	Mentzelia puberula	Argus blazing star					—			
	Physalis lobata	lobed ground cherry					—			
	Portulaca halimoides	desert portulaca					—			
	Proboscidea althaeifolia	desert unicorn plant					—			
	Salvia greatae	Orocopia sage					—			
	Selaginella eremophila	Desert spikemoss					—			
	Senna covesii	Coves' cassia					—			
	Teucrium cubense ssp. depressum	dwarf germander					—			

Family	Scientific Name	Common Name	Phenology(ies)				Day(s)			
			D	V	B	F	M	T	W	Th
	Wislizenia refracta ssp. refracta	Jackass clover					—			
	Xylorhiza orcuttii	Orcutt's Woody-aster					—			
OTHER SPECIES NEW TO LIST										
	Stephanomeria exigua			✓			✓			
	Pectocarya heterocarpa				✓	✓	✓			
	Achyrachaena mollis				✓		✓			
	Oenothera deltoides			✓	✓		✓			
	Streptanthella longirostris				✓	✓	✓			
	Baileya pauciradiata				✓		✓			
	Abronia villosa				✓		✓			
	Calycoseris parryi ?				✓		✓			
	Hesperocallis undulata			✓	✓		✓			
	Streptanthella longirostris				✓	✓	✓			
	Eriastrum			✓			✓			
	Dicoria canescens			✓			✓			
	Psorothamnus emoryi			✓			✓			
	Astragalus avidus				✓	✓	✓			
	" didymocarpus				✓		✓			
	Stillingia spinulosa			✓			✓			
	Baileya pauciradiata			✓	✓		✓			
	Aristida californica		✓	✓			✓			
	Phacelia neglecta			✓	✓		✓			
	Lotus strigosus tomentosus				✓		✓			

* Nonnative species

BLYTHE SOLAR POWER PROJECT

SPRING 2010 BOTANICAL SURVEYS

SCAN DETAILS

Surveyor	Hendricks-Morgal, Bonnie
Scanned By	Harper, Kyle
Scan Date	05.17.2010

Blythe-4/6/10 Bonnie Hendricks-Morgan
Palen T-4/7/10 Fred, Jeanette, Lance, ~~Fred~~ Fed, Mark
Palen T-4/8/10
Garmin SM9

BLYTHE

INSTRUCTIONS: Please mark the plant species you see, including the day(s) of observation and the phenology(ies) observed. Mark the DOMINANT phenology with an "X", and all other observed phonologies with an "O".

There is additional room for new species at the bottom of each list.

If you observe a species that you are not sure of… please collect it! If you can't collect it because it is not fruiting, etc. or the population is too small, then photograph it! Take it back to the motel and key the darn thing if you can. It is on, or may be on, our rare plant hit list. ☺

Phenology Codes: D = Dead/Dormant, V = Vegetative, B = Blooming, F = Fruiting

Family	Scientific Name	Common Name	Phenology(ies) D	V	B	F	Day(s) Blythe 4/6 M	Palen T-line 4/7 T	W	Palen T-line 4/8 Th
GNETALES										
Ephedraceae – Ephedta Family										
	Ephedra sp.	ephedra								
MONOCOTS										
Agavaceae – Century Plant Family										
	Hesperocallis undulata	desertlily			X		X			X
Poaceae – Grass Family										
	Aristida adscensionis	sixweeks threeawn								
	Aristida purpurea	purple threeawn								
	Bouteloua barbata var. *barbata*	sixweeks grama								
	Bromus madritensis ssp. *rubens**	red brome, foxtail chess								
	Erioneuron pulchellum (*syn. Dasyochloa pulchella*)	fluff grass								
	Pleuraphis rigida	big galleta grass			X		X			X
	*Schismus arabicus**	Mediterranean grass			X		X		X	X
	*Vulpia bromoides**	brome fescue								
	Vulpia octoflora	sixweeks fescue								
DICOTS										
Asclepiadaceae – Milkweed Family										
	Asclepias subulata	rush milkweed								
	Cynanchum utahense	Utah cynanchum								
	Sarcostemma cynanchoides	climbing milkweed	X				X			

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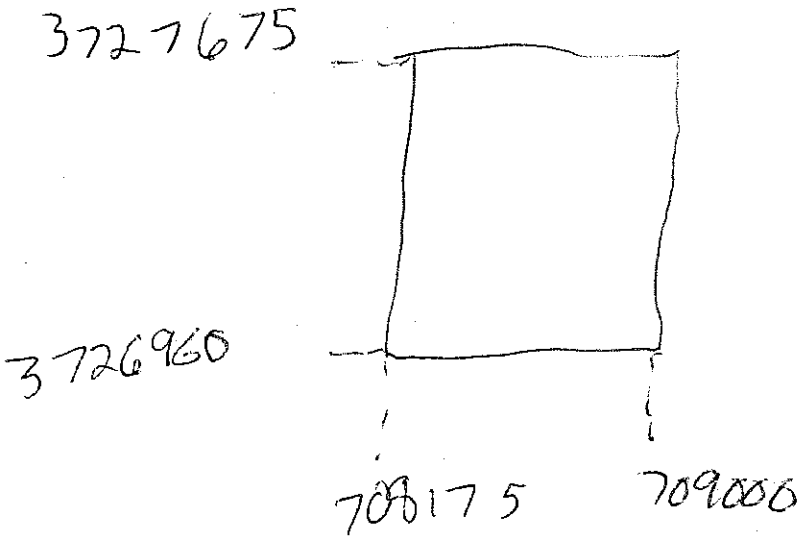
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Family	Scientific Name	Common Name	Phenology(ies)				Day(s)			
			D	V	B	F	M	T	W	Th
	ssp. *hartwegii*									
	Sarcostemma hirtellum	trailing townula, hairy milkweed								
Asteraceae – Sunflower Family										
	Adenophyllum porophylloides	San Felipe dyssodia								
	Ambrosia dumosa	burroweed , white bursage			X		X		X	X
	Atrichoseris platyphylla	parachute plant , gravel ghost								
	Bebbia juncea var. *aspera*	sweetbush			X					X
	Calycoseris wrightii	white tackstem			X				X	
	Chaenactis carphoclinia	pebble pincushion							X	X
	Chaenactis stevioides	desert pincushion			X		X		X	
	Encelia farinosa var. farinosa	brittlebush, incienso			X		X			X
	Encelia farinosa var. phenicodonta	dark-eyed brittlebush			X		X			
	Encelia frutescens	button brittlebush								
	Geraea canescens	desert-sunflower			X		X		X	X
	Hymenoclea salsola	cheesebush							X	X
	Malacothrix glabrata	desert dandelion			X		X		X	X
	Monoptilon bellioides	Mojave desertstar			X		X			
	Palafoxia arida var. *arida*	Spanish needle, desert palafox			X		X			X
	Perityle emoryi	Emory's rockdaisy			X					X
	Pectis papposa	chinchweed								
	Porophyllum gracile	odora								
	Prenanthella exigua	brightwhite								
	Rafinesquia neomexicana	desert chicory			X		X		X	X
	Senecio mohavensis	Mojave ragwort, Mohave Groundsel								
	Stephanomeria exigua	small wire lettuce								
	Stephanomeria pauciflora var. *pauciflora*	wire lettuce								
	Trichoptilium incisum	yellowhead, yellowdome								
	Trixis californica var. *californica*	American threefold								
	Stylocline gnaphalioides				X		X			
	Psathrotiza tomentosa				X					X
Boraginaceae – Borage Family										
	Amsinckia menziesii var. *menziesii*	rancher's fireweed			X		X		X	
	Amsinckia tessellata	fiddleneck								

Family	Scientific Name	Common Name	Phenology(ies)				Day(s)			
			D	V	B	F	M	T	W	Th
	Cryptantha angustifolia	narrow leaved cryptantha			X		X		X	X
	Cryptantha barbigera	bearded cryptantha			X				X	X
	Cryptantha costata	ribbed cryptantha								
	Cryptantha holoptera	winged cyptantha								
	Cryptantha maritima var. maritima	Guadalupe cryptantha								X
	Cryptantha maritima var. pilosa	Guadalupe cryptantha			X		X			
	Cyptantha nevadensis var. nevadensis	Nevada catseye			X		X			
	Cryptantha pterocarya var. cycloptera	wingnut cryptantha								
	Pectocarya penicillata	chuckwalla combseed								
	Pectocarya platycarpa	broadfruit combseed				X	X		X	X
	Pectocarya recurvata	curvenut combseed, combur								
	Plagiobothrys jonesii ?	Mojave popcornflower			X		X			
	Tiquilia palmeri	Palmer's coldenia			X					X
	Tiquilia plicata	fanleaf crinklemat, plicate coldenia								
	Pectocarya heterocarpa					X	X		X	
Brassicaceae – Mustard Family										
	*Brassica tournefortii**	Saharan mustard, Sahara mustard			X		X		X	X
	Dithyrea californica	spectacle-pod				X				X
	Guillenia lasiophyllum	California mustard								
	Lepidium lasiocarpum	pepperweed			X		X		X	
	*Sisymbrium irio**	London rocket								
	Tropidocarpum gracile	dobie pod								
Cactaceae – Cactus Family										
	Echinocactus polycephalus var. *polycephalus*	cottontop cactus, clustered barrel cactus								
	Ferocactus cylindraceus var. *cylindraceus*	California barrel cactus								

Family	Scientific Name	Common Name	Phenology(ies)				Day(s)			
			D	V	B	F	M	T	W	Th
	Mammillaria tetrancistra	common fishhook cactus			X				X	
	Opuntia basilaris	beavertail cactus								
	Opuntia echinocarpa (*Cylindropuntia e.*)	silver cholla, golden cholla			X		X		X	
	Opuntia ramosissima (*Cylindropuntia r.*)	pencil cactus, diamond cholla							X	X
	Nemacladus	threadplant								
Caryophyllaceae										
	Anchyronychia cooperi				X				X	X
Chenopodiaceae – Goosefoot Family										
	Atriplex polycarpa	allscale saltbrush								
	Atriplex hymenelytra	desert holly								
	Chenopodium murale	nettleleaf goosefoot								
	Chenopodium sp.	goosefoot								
	*Salsola tragus**	Russian thistle, tumbleweed		X						X
Cucurbitaceae – Gourd Family										
	Brandegea bigelovii	desert starvine			X	X	X			X
Euphorbiaceae – Spurge Family										
	Chamaesyce polycarpa	smallseed sandmat	X				X		X	X
	Ditaxis lanceolata	Narrowleaf ditaxis, narrowleaf silverbush								
	Ditaxis neomexicana	New Mexico ditaxis		X			X			
	Euphorbia eriantha	beetle spurge								
	Stillingia serrata				X				X	X
	Ditaxis									
Fabaceae – Legume Family										
	Acacia gregii	catclaw		X			X		X	
	Astragalus nuttallianus var. *imperfectus*	turkey peas								
	Astragalus insularis var. *harwoodii*	Harwood's milkvetch			X	X	X			
	Cercidium floridium ssp. *floridium*	blue palo verde		X			X		X	X
	Dalea mollis	silky dalea, hairy prairie clover								

Family	Scientific Name	Common Name	Phenology(ies)				Day(s)			
			D	V	B	F	M	T	W	Th
	Dalea mollissima	hairy dalea, downy dalea			X				X	X
	Lotus strigosus var. tomentellus	strigose bird's-foot trefoil			X	X	X			
	Lotus wrangelianus	Chilean bird's-foot trefoil								
	Lupinus cf. *arizonicus*	Arizona lupine			X		X		X	X
	Marina parryi	Parry's false prairie clover								X
	Olneya tesota	ironwood		X			X		X	X
	Prosopis glandulosa	honey mesquite		X			X			
	Psorothamnus spinosum	smoke tree		X			X			X
	Senna armata	spiny senna, desert senna								
Fouquieriaceae – Ocotillo Family										
	Fouquieria splendens ssp. *splendens*	ocotillo							X	
Geraniaceae – Geranium Family										
	Erodium texanum	Texas storksbill, Desert Heron's Bill								
Hydrophyllaceae – Waterleaf Family										
	Eucrypta micrantha	dainty desert hideseed								
	Nama demissum var. *demissum*	purplemat			X		X			
	Phacelia crenulata var. *ambigua*	purplestem phacelia								
	Phacelia crenulata var. *minutiflora*	cleftleaf wildheliotrope			X		X		X	X
	Phacelia neglecta	alkali phacelia			X		X			
	(or rotundifolia)									X
	Nama sp.				X		X			X
(Palen)	Emmenanthe pendulifloro				X				X	
Krameriaceae – Rhatany Family										
	Krameria erecta	Pima rharany, littleleaf ratany								
	Krameria grayi	white rhatany			X		X			

Family	Scientific Name	Common Name	Phenology(ies)				Day(s)			
			D	V	B	F	M	T	W	Th
Lamiaceae – Mint Family										
	Hyptis emoryi	desert-lavender			X				X	
(Paley)	Salvia columbarea				X				X	X
Loasaceae – Loasa Family										
	Mentzelia cf. *albicaulis*	small flowered blazing star, white stemmed stickleaf								X
	Mentzelia involucrata	whitebract blazingstar								X
Malvaceae – Mallow Family										
	Eremalche rotundifolia	desert five-spot			X		X			
	Hibiscus denudatus	paleface								
	Sphaeralcea ambigua	desert globemallow , apricot mallow								
Martyniaceae – Unicorn-Plant Family										
	Proboscidea althaeifolia	desert unicorn-plant		X			X			
Nyctaginaceae – Four O'Clock Family										
	Abronia villosa var. *villosa*	desert sand verbena			X		X		X	X
	Allionia incarnata	trailing allionia, windmills								
	Boerhavia	spiderling								
	Mirabilis bigelovii	wishbone bush								
~~Polymoniaceae~~										
Onagraceae – Evening Primrose Family										
	Camissonia boothii ssp. *desertorum*	desert suncup			X		X		X	X
	Camissonia brevipes ssp. *brevipes*	golden suncup								
	Camissonia cf. *cardiophylla*	heartleaf suncup								
	Camissonia claviformis	browneyes			X		X			
	Camissonia refracta	narrowleaf suncup								
	Oenothera deltoides				X		X			
										X

760 977 7810

Family	Scientific Name	Common Name	Phenology(ies)				Day(s)			
			D	V	B	F	M	T	W	Th
Resedaceae – Mignonette Family										
	Oligomeris linifolia	lineleaf whitepuff			X		X			X
Rhamnaceae – Buckthorn Family										
	Colubrina californica	las animas colubrina								
	Ziziphus cf. *obtusifolia* var. *canescens*	graythorn								
Scrophulariaceae – Figwort Family										
	Antirrhinum filipes	twining snapdragon								
	Mohavea confertiflora	ghost flower								
Solanaceae – Nightshade Family										
	Lycium andersonii	water jacket, Anderson's desert thorn				X			X	
	Physalis hederifolia var. *fendleri*	Fendler's groundcherry								
Tamaricaceae – Tamarisk Family										
	Tamarix sp.*	Tamarisk								
Viscaceae – Mistletoe Family										
	Phoradendron californicum	desert mistletoe							X	
Zygophyllaceae – Caltrop Family										
	Fagonia laevis	California fagonbush			X					X
	Larrea tridentata	creosote bush			X		X		X	X
	Kallstroemia parviflora	warty caltrop								
RARE PLANT TARGET LIST										
	Acleisanthes longiflora	Angel trumpets								
	Androstephium breviflorum	small-flowered androstephium								
	Astragalus insularis var. harwoodii	Harwood's milkvetch			X		X			X
	Astragalus lentiginosus var. coachellae	Coachella Valley milkvetch								
	[illegible]nia compacta	California ayenia								
	[illegible]alliandra eriophylla	Fairyduster								

4/8/10 Bonnie Hendricks
Palen Tran. W. end of E. Segment
w/ Fred, Lance, Ted, Jeannette + Mark

Desert Pavement
CBS
Desert Wash Woodland at W. end

Desert Pavement
Psathyrotis ramosissima
Chaenactis polycarpa
Lupinus arizonica
Plantago ovata
Chaenactis stevioides
Malacothrix glabrata
DW Tiquilia greyii
Pleuraphis rigida
Ambrosia dumosa
Larrea tri.
Cryptantha nevadensis
Cryptantha angust.
Eschscholzia minutiflora
DP Ephedra can.
Hymenoclea salsola

DW
Phacelia cren.
Cercidium flor.
Olneya tesota
Cryptantha barbigera
Perityle emoryi
Phacelia sp. cf. distans
Eriogonum tomasii
Chorizanthe brevicorne
DP Camissonia boothii
Desert 5-spot

Family	Scientific Name	Common Name	Phenology(ies)				Day(s)			
			D	V	B	F	M	T	W	Th
Papaveraceae – Poppy Family										
	Eschscholzia glyptosperma	desert poppy , desert golden poppy			X				X	
	Eschscholzia minutiflora	pygmy poppy, Coville's poppy			X				X	X
Plantaginaceae – Plantain Family										
	Plantago ovata	desert Indianwheat, woolly plantain			X		X		X	X
Polemoniaceae – Phlox Family										
	Gilia brecciarum ssp. *brecciarum*	Nevada gilia								
	Gilia latifolia	broadleaf gilia								
	Gilia stellata	star gilia								
	Langloisia setosissima ssp. *setosissima*	bristly langloisia					X			
	Linanthus jonesii	Jones' linanthus			X		X			X
	Loeseliastrum schottii	Schott's calico								X
	Erlastrum diffusum				X		X			
Polygonaceae – Buckwheat Family										
	Chorizanthe brevicornu var. *brevicornu*	brittle spineflower			X				X	X
	Chorizanthe corrugata	wrinkled spineflower								
	Chorizanthe rigida	spiny-herb			X		X			
	Eriogonum inflatum var. *inflatum*	desert trumpet								
	Eriogonum reniforme	kidneyleaf buckwheat								
	Eriogonum thomasii	Thomas Eriogonum			X				X	X
	Eriogonum trichopes	little deserttrumpet								

4/7/10 page 2 cont.

Palen Transmission Line

Schismus arabicus
Plantago ovata
Emmananthe penduliflora
Lepidium lasiocarpum
Amsinkia menziesii
Cylindropuntia echino.
x Ditaxis californica (glabrous 10++)
Marina parryi
Mammalaria tetrancistra fr.
Cylindropuntia ramosissima v.
Lycium andersonii fr.
Fagonia

Horned Lizard-pic. Coyote Scat
+ Larrea trid
Cryptantha angust
Plant ovata
Abronia villosa
Desperoc.
Gerea canescens
Eriogonum
Pectocarya hetero.
Spurge
Chaenactis stevioides

Family	Scientific Name	Common Name	Phenology(ies)				Day(s)			
			D	V	B	F	M	T	W	Th

Palen T-line

4/7/10

Hyp. emoryi
Cryptantha barbigera
Chaenactis carfofina
Escholtzia glyptosperma
Lupinus arizonica
Hymenoclea salsola
Cercidium floridum
Malacothrix glabrata
Salvia columbariae
Rafinesquia
Ambrosia dumosa
Larrea tridentata
Eriogonum cf. tomasii/reniforme
Acacia greggii
Chaenactis stevioides
Cryptantha angustifolia
Camissonia boothii desertorum
Pectocarya heterocarpa
Brassica tournifortii
Camissonia sp.
Olneya tesota
Phorodendron
Pectocarya platycarpha
Calycoseris wrightii white tackstem
Phacelia crenulata minutiflora
Escholtzia minutiflora
Chorizanthe brevicorne
Chamaesyce polycarpa
Dalea mollissima

Family	Scientific Name	Common Name	Phenology(ies)				Day(s)			
			D	V	B	F	M	T	W	Th

* Nonnative species

4/6/10 Cont. pg. 2

Desert Pavement - cobbles w/ sparse veg cover < 1%

Gerea canescens
Chaenactis stevioides
Chorizanthe rigida
Plantago ovata

Desert Wash

Ditaxis sp.
Pleuraphis rigida
Rafinesquia neomexicana
Ambrosia dumosa
Malacothrix glabrata
Psorothamnus ~~spinosa~~ spinosum
Olneya tesota
Palafoxia arida
Abronia villosa var. villosa

Acronicia
Phacelia crenulata, minutiflora
* Proboscidea althaefolia

4/6/10

CBS
+ Larrea tri
+ Cercea canescen
+ Plantago ovata
Cryptantha angust
+ Ambrosia dumosa
Betacanya heterocarpa, B. platycarpa removed.
+ Astragalus insularis harwoodii
Encelia farinosa
Brassica tournefortii
Chaenactis
Pleurolphis rigida
Nama
Camissonia claviformis
Cylindropuntia echinocarpa
Olneya tesota
Eriastrum sp. cf diffusum
Lepidium lasiocarpum
Kramena grayi
Cryptantha nevadensis flw + fr.
Eriogonum
Lotus
Chorizanthe rigida, C. brevicorne
Hesperocallis undulata
Acacia greggii
Lupinus cf. arizonicus

4/14/10 Bonnie Hendricks-Morgal, Hea S., Jennifer
Garmin - SM9 Blythe Substation Buffer + T-Line Alt.

4/15/10 Valero line

BLYTHE

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Phenology Codes: D = Dead/Dormant, V = Vegetative, B = Blooming, F = Fruiting

Family	Scientific Name	Common Name	Phenology(ies)				Day(s) 4/14			
			D	V	B	F	M	T	W	Th
GNETALES										
Ephedraceae – Ephedta Family										
	Ephedra sp.	ephedra								
MONOCOTS										
Agavaceae – Century Plant Family										
	Hesperocallis undulata	desertlily			X	X			X	
Poaceae – Grass Family										
	Aristida adscensionis	sixweeks threeawn								
	Aristida purpurea	purple threeawn								
	Bouteloua barbata var. *barbata*	sixweeks grama								
	Bromus madritensis ssp. *rubens**	red brome, foxtail chess								
	Erioneuron pulchellum (*syn. Dasyochloa pulchella*)	fluff grass								
	Pleuraphis rigida	big galleta grass			X				X	X
	*Schismus arabicus**	Mediterranean grass			X				X	X
	*Vulpia bromoides**	brome fescue								
	Vulpia octoflora	sixweeks fescue								
	Hordeum sp.					X				X
	Cynodon dactylon					X				X
DICOTS										
Asclepiadaceae – Milkweed Family										
	Asclepias subulata	rush milkweed		X						X
	Cynanchum utahense	Utah cynanchum								
	Sarcostemma cynanchoides	climbing milkweed								

Family	Scientific Name	Common Name	Phenology(ies)				Day(s)			
			D	V	B	F	M	T	W	Th
	ssp. *hartwegii*									
	Sarcostemma hirtellum	trailing townula, hairy milkweed								
Asteraceae – Sunflower Family										
	Adenophyllum porophylloides	San Felipe dyssodia								
	Ambrosia dumosa	burroweed , white bursage			X	X			X	X
	Atrichoseris platyphylla	parachute plant , gravel ghost								
	Bebbia juncea var. *aspera*	sweetbush								
	Calycoseris wrightii	white tackstem			X				X	
	Chaenactis carphoclinia	pebble pincushion			X				X	X
	Chaenactis stevioides	desert pincushion			X	X			X	X
	Encelia farinosa var. farinosa	brittlebush, incienso			X					X
	Encelia farinosa var. phenicodonta '	dark-eyed brittlebush								
	Encelia frutescens	button brittlebush								
	Geraea canescens	desert-sunflower			X				X	X
	Hymenoclea salsola	cheesebush			X					X
	Malacothrix glabrata	desert dandelion			X				X	X
	Monoptilon bellioides	Mojave desertstar								
	Palafoxia arida var. *arida*	Spanish needle, desert palafox			X				X	
	Perityle emoryi	Emory's rockdaisy		X						X
	Pectis papposa	chinchweed								
	Porophyllum gracile	odora								
	Prenanthella exigua	brightwhite								
	Rafinesquia neomexicana	desert chicory			X				X	X
	Senecio mohavensis	Mojave ragwort, Mohave Groundsel								
	Stephanomeria exigua var. ex.	small wire lettuce			X				X	
	Stephanomeria pauciflora var. *pauciflora*	wire lettuce		X						X
	Trichoptilium incisum	yellowhead, yellowdome								
	Trixis californica var. *californica*	American threefold								
	Baileya pauciradiata				X				X	
	Pseudobahia ramosissima			X						X
	Lactuca serriola			X						X
Boraginaceae – Borage Family										
	Amsinckia menziesii var. *menziesii*	rancher's fireweed								
	Amsinckia tessellata	fiddleneck								

Family	Scientific Name	Common Name	Phenology(ies)				Day(s)			
			D	V	B	F	M	T	W	Th
	Cryptantha angustifolia	narrow leaved cryptantha			X	X			X	X
	Cryptantha barbigera	bearded cryptantha			X	X				X
	Cryptantha costata	ribbed cryptantha			X	X			X	
	Cryptantha holoptera	winged cyptantha								
	Cryptantha maritima var. maritima	Guadalupe cryptantha				X			X	X
	Cryptantha maritima var. pilosa	Guadalupe cryptantha								
	Cyptantha nevadensis var. nevadensis	Nevada catseye				X				X
	Cryptantha pterocarya var. cycloptera	wingnut cryptantha								
	Pectocarya penicillata	chuckwalla combseed								
	Pectocarya platycarpa	broadfruit combseed			X	X			X	X
	Pectocarya recurvata	curvenut combseed, combur								
	Plagiobothrys jonesii	Mojave popcornflower								
	Tiquilia palmeri	Palmer's coldenia			X				X	
	Tiquilia plicata	fanleaf crinklemat, plicate coldenia								
	Pectocarya heterocarpha					X			X	X
Brassicaceae – Mustard Family										
	*Brassica tournefortii**	Saharan mustard, Sahara mustard			X	X			X	X
	Dithyrea californica	spectacle-pod				X			X	
	Guillenia lasiophyllum	California mustard								
	Lepidium lasiocarpum	pepperweed				X			X	X
	*Sisymbrium irio**	London rocket								
	Tropidocarpum gracile	dobie pod								
Cactaceae – Cactus Family										
	Echinocactus polycephalus var. *polycephalus*	cottontop cactus, clustered barrel cactus								
	Ferocactus cylindraceus var. *cylindraceus*	California barrel cactus								

Family	Scientific Name	Common Name	Phenology(ies)				Day(s)			
			D	V	B	F	M	T	W	Th
	Mammillaria tetrancistra	common fishhook cactus								
	Opuntia basilaris	beavertail cactus								
	Opuntia echinocarpa (*Cylindropuntia e.*)	silver cholla, golden cholla			X					X
	Opuntia ramosissima (*Cylindropuntia r.*)	pencil cactus, diamond cholla								
	Nemacladus	threadplant								
Caryophyllaceae										
	Acha									
					X				X	
Chenopodiaceae – Goosefoot Family										
	Atriplex polycarpa	allscale saltbrush								
	Atriplex hymenelytra	desert holly								
	Chenopodium murale	nettleleaf goosefoot								
	Chenopodium sp.	goosefoot								
	*Salsola tragus**	Russian thistle, tumbleweed			X				X	
Cucurbitaceae – Gourd Family										
	Brandegea bigelovii	desert starvine								
Euphorbiaceae – Spurge Family										
	Chamaesyce polycarpa	smallseed sandmat								
	Ditaxis lanceolata	Narrowleaf ditaxis, narrowleaf silverbush		X				X	X	
	Ditaxis neomexicana	New Mexico ditaxis								
	Euphorbia eriantha	beetle spurge			X				X	
	Stillingia									
					X			X		
Fabaceae – Legume Family										
	Acacia gregii	catclaw		X						
	Astragalus nuttallianus var. *imperfectus*	turkey peas							X	
	Astragalus insularis var. *harwoodii*	Harwood's milkvetch			X	X		X	X	
	Cercidium floridium ssp. *floridium*	blue palo verde		X	X	X			X	
	Dalea mollis	silky dalea, hairy prairie clover								

Family	Scientific Name	Common Name	Phenology(ies)				Day(s)			
			D	V	B	F	M	T	W	Th
	Dalea mollissima	hairy dalea, downy dalea		X					X	
	Lotus strigosus var. tomentellus	strigose bird's-foot trefoil				X			X	X
	Lotus wrangelianus	Chilean bird's-foot trefoil								
	Lupinus cf. *arizonicus*	Arizona lupine								
	Marina parryi	Parry's false prairie clover		X	X	X				X
	Olneya tesota	ironwood								X
	Prosopis glandulosa	honey mesquite								
	Psorothamnus spinosum	smoke tree								
	Senna armata	spiny senna, desert senna								
	Astragalis aridus				X	X			X	
	Melilotus indicus				X	X				X
Fouquieriaceae – Ocotillo Family										
	Fouquieria splendens ssp. *splendens*	ocotillo								
Geraniaceae – Geranium Family										
	Erodium texanum	Texas storksbill, Desert Heron's Bill								
Hydrophyllaceae – Waterleaf Family										
	Eucrypta micrantha	dainty desert hideseed								
	Nama demissum var. *demissum*	purplemat			X					X
	Phacelia crenulata var. *ambigua*	purplestem phacelia								
	Phacelia crenulata var. *minutiflora*	cleftleaf wildheliotrope			X					X
	Phacelia neglecta	alkali phacelia			X				X	
	Nama sp.				X					X
Krameriaceae – Rhatany Family										
	Krameria erecta	Pima rharany, littleleaf ratany								
	Krameria grayi	white rhatany			X					X

Family	Scientific Name	Common Name	Phenology(ies)				Day(s)			
			D	V	B	F	M	T	W	Th
Lamiaceae – Mint Family										
	Hyptis emoryi	desert-lavender								
Loasaceae – Loasa Family										
	Mentzelia cf. *albicaulis*	small flowered blazing star, white stemmed stickleaf			X				X	
	Mentzelia involucrata	whitebract blazingstar				X			X	
Malvaceae – Mallow Family										
	Eremalche rotundifolia	desert five-spot								
	Hibiscus denudatus	paleface								
	Sphaeralcea ambigua	desert globemallow , apricot mallow								
Martyniaceae – Unicorn-Plant Family										
	Proboscidea althaeifolia	desert unicorn-plant								
Nyctaginaceae – Four O'Clock Family										
	Abronia villosa var. *villosa*	desert sand verbena			X				X	
	Allionia incarnata	trailing allionia, windmills								
	Boerhavia	spiderling								
	Mirabilis bigelovii	wishbone bush								
Onagraceae – Evening Primrose Family										
	Camissonia boothii ssp. *desertorum*	desert suncup			X	X				X
	Camissonia brevipes ssp. *brevipes*	golden suncup								
	Camissonia cf. *cardiophylla*	heartleaf suncup								
	Camissonia claviformis	browneyes				X			X	X
	Camissonia refracta	narrowleaf suncup								
	Oenothera deltoides				X				X	
	Oenothera primaverea				X					X

Family	Scientific Name	Common Name	Phenology(ies)				Day(s)			
			D	V	B	F	M	T	W	Th
Papaveraceae – Poppy Family										
	Eschscholzia glyptosperma	desert poppy , desert golden poppy								
	Eschscholzia minutiflora	pygmy poppy, Coville's poppy			X					X
Plantaginaceae – Plantain Family										
	Plantago ovata	desert Indianwheat, woolly plantain			X				X	X
Polemoniaceae – Phlox Family										
	Gilia brecciarum ssp. *brecciarum*	Nevada gilia								
	Gilia latifolia	broadleaf gilia								
	Gilia stellata	star gilia								
	Langloisia setosissima ssp. *setosissima*	bristly langloisia								
	Linanthus jonesii	Jones' linanthus			X				X	
	Loeseliastrum schottii	Schott's calico			X				X	
*	*Eriastrum harwoodii*				X				X	
	Eriastrum diffusum				X					X
Polygonaceae – Buckwheat Family										
	Chorizanthe brevicornu var. *brevicornu*	brittle spineflower			X				X	X
	Chorizanthe corrugata	wrinkled spineflower			X				X	
	Chorizanthe rigida	spiny-herb			X				X	
	Eriogonum inflatum var. *inflatum*	desert trumpet								
	Eriogonum reniforme	kidneyleaf buckwheat								
	Eriogonum thomasii	Thomas Eriogonum			X				X	X
	Eriogonum trichopes	little deserttrumpet								

Family	Scientific Name	Common Name	Phenology(ies)				Day(s)			
			D	V	B	F	M	T	W	Th
Resedaceae – Mignonette Family										
	Oligomeris linifolia	lineleaf whitepuff				X			X	
Rhamnaceae – Buckthorn Family										
	Colubrina californica	las animas colubrina								
	Ziziphus cf. *obtusifolia* var. *canescens*	graythorn								
Scrophulariaceae – Figwort Family										
	Antirrhinum filipes	twining snapdragon								
	Mohavea confertiflora	ghost flower								
Solanaceae – Nightshade Family										
	Lycium andersonii	water jacket, Anderson's desert thorn								
	Physalis hederifolia var. *fendleri*	Fendler's groundcherry								
Tamaricaceae – Tamarisk Family										
	Tamarix sp. *	Tamarisk			X					X
Viscaceae – Mistletoe Family										
	Phoradendron californicum	desert mistletoe								
Zygophyllaceae – Caltrop Family										
	Fagonia laevis	California fagonbush								
	Larrea tridentata	creosote bush			X	X			X	
	Kallstroemia parviflora	warty caltrop								
RARE PLANT TARGET LIST										
	Acleisanthes longiflora	Angel trumpets								
	Androstephium breviflorum	small-flowered androstephium								
	Astragalus insularis var. harwoodii	Harwood's milkvetch			X	X			X	X
	Astragalus lentiginosus var. coachellae	Coachella Valley milkvetch								
	Ayenia compacta	California ayenia								
	Calliandra eriophylla	Fairyduster								

Family	Scientific Name	Common Name	Phenology(ies)				Day(s)			
			D	V	B	F	M	T	W	Th
	Calochortus striatus	Alkali mariposa-lily								
	Castela emoryi	Crucifixion thorn								
	Chamaesyce abramsiana	Abram's spurge								
	Chamaesyce platysperma	Flat-seeded spurge								
	Colubrina californica	Las Animas colubrine								
	Condalia globosa var. pubescens	bitter snakewood								
	Corypantha alversonii	Foxtail cactus								
*	*Cryptantha costata*	ribbed cryptantha			X	X			X	
	Cryptantha holoptera	winged cryptantha								
	Cynanchum utahense	Utah milkvine								
	Ditaxis claryana	glandular ditaxis								
	Ditaxis serrata var. californica	California ditaxis								
	Echinocactus polycephalus var. polycephalus	cottontop cactus								
	Echinocereus engelmannii	hedgehog cactus								
	Echinocereus triglochidiatus	hedgehog cactus								
*	*Eriastrum harwoodii*	Harwood's wollystar			X				X	
	Ferocactus cylindraceus	California barrel cactus								
	Horsfordia alata	pink velvet mallow								
	Hymenoxys odorata	bitter hymenoxys								
	Imperata brevifolia	California satintail								
	Matelea parvifolia	spearleaf								
	Mentzelia puberula	Argus blazing star								
	Physalis lobata	lobed ground cherry								
	Portulaca halimoides	desert portulaca								
	Proboscidea althaeifolia	desert unicorn plant								
	Salvia greatae	Orocopia sage								
	Selaginella eremophila	Desert spikemoss								
	Senna covesii	Coves' cassia								
	Teucrium cubense ssp. depressum	dwarf germander								
	Wislizenia refracta ssp. refracta	Jackass clover								
	Xylorhiza orcuttii	Orcutt's Woody-aster								
OTHER SPECIES NEW TO LIST										

Family	Scientific Name	Common Name	Phenology(ies)				Day(s)			
			D	V	B	F	M	T	W	Th

Family	Scientific Name	Common Name	Phenology(ies)				Day(s)			
			D	V	B	F	M	T	W	Th

* Nonnative species

CBS / DWW

+ Lartrid
Pleural ng
Olneya tes
Ambdum
+ Cer flor
* As in ha in disturbed graded area and in undisturbed area of DWW + CBS

Ditaxis neomex.
Marina parryi
Eriastrum diffusum
Tidestromia oblongifolia

4/15/10

Valero Station T-line

DWW channel with WUS + Desert Dry Wash Woodl
+ Cercidium flor. DWW
+ Melilotus indicus
Asclepias

CBS
+ Larrea tri
++ Amb dum
Crypt ang
Chaem. palag.
Acacia greggi
Asclepias sinuolata
Encelia far.
* Astragalus insularis var
Pectocarya platycarpha
Phacelia cremulata
Schismus arabatus
Palafoxia arida arida

DWW Tamarix sp. + Cerc.
Crabgrass
in channel Lepidium lasiocarpum
Mel ind

Outer buffer is planed desert pavement.
Brassica tournefortii present but not domi

BLYTHE SOLAR POWER PROJECT

SPRING 2010 BOTANICAL SURVEYS

SCAN DETAILS

Surveyor	Silverman, David
Scanned By	Harper, Kyle
Scan Date	05.17.2010

Data submitted to AECOM electronically.

Refer to geodatabase and floral inventory.

BLYTHE SOLAR POWER PROJECT

SPRING 2010 BOTANICAL SURVEYS

SCAN DETAILS

Surveyor	Bergman, Erin
Scanned By	Harper, Kyle
Scan Date	05.17.2010

Data submitted to AECOM electronically.

Refer to geodatabase and floral inventory.

BLYTHE SOLAR POWER PROJECT

SPRING 2010 BOTANICAL SURVEYS

SCAN DETAILS

Surveyor	Sproul, Fred
Scanned By	Harper, Kyle
Scan Date	05.17.2010

3/15/10 **BLYTHE** FRED SPROUL

Family	Scientific Name	Common Name	Phenology(ies) D	V	B	F	Day(s) M	T	W	Th
		GNETALES								
Ephedraceae – Ephedta Family										
	Ephedra sp.	ephedra								
		MONOCOTS								
Poaceae – Grass Family										
	Aristida adscensionis	sixweeks threeawn								
	Aristida purpurea	purple threeawn								
	Bouteloua barbata var. *barbata*	sixweeks grama								
	Bromus madritensis ssp. *rubens**	red brome, foxtail chess								
	Erioneuron pulchellum (*syn. Dasyochloa pulchella*)	fluff grass								
	Pleuraphis rigida	big galleta grass								
	Schismus sp.*	Mediterranean grass		✓						
	*Vulpia bromoides**	brome fescue			✓	✓				
	Vulpia octoflora	sixweeks fescue								
		DICOTS								
Asclepiadaceae – Milkweed Family										
	Asclepias subulata	rush milkweed								
	Cynanchum utahense	Utah cynanchum								
	Sarcostemma cynanchoides ssp. *hartwegii*	climbing milkweed								
	Sarcostemma hirtellum	trailing townula, hairy milkweed								
Asteraceae – Sunflower Family										
	Adenophyllum porophylloides	San Felipe dyssodia								
✓	*Ambrosia dumosa*	burroweed , white bursage		✓						
	Atrichoseris platyphylla	parachute plant , gravel ghost								
	Bebbia juncea var. *aspera*	sweetbush								
	Calycoseris wrightii	white tackstem								
	Chaenactis carphoclinia	pebble pincushion								
✓	*Chaenactis stevioides*	desert pincushion								
	Encelia farinosa	brittlebush, incienso			✓					
	Encelia frutescens	button brittlebush								
	Geraea canescens	desert-sunflower								
	Hymenoclea salsola	cheesebush								
	Malacothrix glabrata	desert dandelion								
	Monoptilon bellioides	Mojave desertstar								
	Palafoxia arida var. *arida*	Spanish needle, desert palafox								
	Perityle emoryi	Emory's rockdaisy			✓	✓				
	Pectis papposa	chinchweed								
	Porophyllum gracile	odora								
	Prenanthella exigua	brightwhite								
✓	*Rafinesquia neomexicana*	desert chicory								
	Senecio mohavensis	Mojave ragwort, Mohave Groundsel			✓					

Family	Scientific Name	Common Name	Phenology(ies)				Day(s)			
			D	V	B	F	M	T	W	Th
	Stephanomeria pauciflora var. *pauciflora*	wire lettuce								
	Trichoptilium incisum	yellowhead, yellowdome								
	Trixis californica var. *californica*	American threefold								
Boraginaceae – Borage Family										
	Amsinckia menziesii var. *menziesii*	rancher's fireweed								
✓	*Cryptantha angustifolia*	narrow leaved cryptantha			✓	✓				
	Cryptantha barbigera	bearded cryptantha								
✓	*Cryptantha costata*	ribbed cryptantha specialist			✓	✓				
	Cryptantha maritima	Guadalupe cryptantha on loose sand								
	Cryptantha pterocarya	wingnut cryptantha								
	Pectocarya penicillata	chuckwalla combseed								
	Pectocarya platycarpa	broadfruit combseed								
✓	*Tiquilia plicata*	fanleaf crinklemat, plicate coldenia		✓						
Brassicaceae – Mustard Family										
	*Brassica tournefortii**	Saharan mustard, Sahara mustard			✓	✓				
	Dithyrea californica	spectacle-pod								
	Guillenia lasiophyllum	California mustard								
	Lepidium sp.	pepperweed								
	Tropidocarpum gracile	dobie pod								
Cactaceae – Cactus Family										
	Echinocactus polycephalus var. *polycephalus*	cottontop cactus, clustered barrel cactus								
	Ferocactus cylindraceus var. *cylindraceus*	California barrel cactus								
	Mammillaria tetrancistra	common fishhook cactus								
	Opuntia basilaris	beavertail cactus								
	Opuntia echinocarpa (*Cylindropuntia e.*)	silver cholla, golden cholla								
	Opuntia ramosissima (*Cylindropuntia r.*)	pencil cactus, diamond cholla								
Chenopodiaceae – Goosefoot Family										
	Atriplex polycarpa	allscale saltbrush								
	Atriplex hymenelytra	desert holly								
	Chenopodium murale	nettleleaf goosefoot								
	Chenopodium sp.	goosefoot								
	*Salsola tragus**	Russian thistle, tumbleweed								
Cucurbitaceae – Gourd Family										
	Brandegea bigelovii	desert starvine								
Euphorbiaceae – Spurge Family										
	Chamaesyce polycarpa	smallseed sandmat								
	Ditaxis lanceolata	Narrowleaf ditaxis, narrowleaf silverbush								
	Ditaxis neomexicana	New Mexico ditaxis								

Family	Scientific Name	Common Name	Phenology(ies)				Day(s)			
			D	V	B	F	M	T	W	Th
	Euphorbia eriantha	beetle spurge								
Fabaceae – Legume Family										
	Acacia gregii	catclaw								
	Astragalus nuttallianus var. *imperfectus*	turkey peas								
	Astragalus insularis var. *harwoodii*	Harwood's milkvetch								
	Cercidium floridium ssp. *floridium*	blue palo verde								
	Dalea mollis	silky dalea, hairy prairie clover								
	Lotus wrangelianus	Chilean bird's-foot trefoil								
	Lupinus cf. *arizonicus*	Arizona lupine								
	Marina parryi	Parry's false prairie clover								
	Olneya tesota	ironwood								
	Prosopis glandulosa	honey mesquite								
	Psorothamnus spinosum	smoke tree								
	Senna armata	spiny senna, desert senna								
Fouquieriaceae – Ocotillo Family										
	Fouquieria splendens ssp. *splendens*	ocotillo								
Geraniaceae – Geranium Family										
	Erodium texanum	Texas storksbill, Desert Heron's Bill								
Hydrophyllaceae – Waterleaf Family										
	Eucrypta micrantha	dainty desert hideseed								
	Nama demissum var. *demissum*	purplemat								
	Phacelia crenulata var. *ambigua*	purplestem phacelia								
	Phacelia crenulata var. *minutiflora*	cleftleaf wildheliotrope								
Krameriaceae – Rhatany Family										
	Krameria erecta	Pima rharany, littleleaf ratany								
	Krameria grayi	white rhatany								
Lamiaceae – Mint Family										
	Hyptis emoryi	desert-lavender								
Loasaceae – Loasa Family										
	Mentzelia cf. *albicaulis* obscura ?	small flowered blazing star, white stemmed stickleaf			✓	✓				
	Mentzelia involucrata	whitebract blazingstar								
Malvaceae – Mallow Family										
	Eremalche rotundifolia	desert five-spot								
	Hibiscus denudatus	paleface								
	Sphaeralcea ambigua	desert globemallow , apricot mallow								
Martyniaceae – Unicorn-Plant Family										
	Proboscidea althaeifolia	desert unicorn-plant								
Nyctaginaceae – Four O'Clock Family										

Family	Scientific Name	Common Name	Phenology(ies)				Day(s)			
			D	V	B	F	M	T	W	Th
	Allionia incarnata	trailing allionia, windmills								
Onagraceae – Evening Primrose Family										
	Camissonia boothii ssp. *desertorum*	desert suncup								
	Camissonia brevipes ssp. *brevipes*	golden suncup								
	Camissonia cf. *cardiophylla*	heartleaf suncup								
	Camissonia claviformis	browneyes								
	Camissonia refracta	narrowleaf suncup								
Papaveraceae – Poppy Family										
	Eschscholzia glyptosperma	desert poppy , desert golden poppy								
	Eschscholzia minutiflora	pygmy poppy, Coville's poppy								
Plantaginaceae – Plantain Family										
	Plantago ovata	desert Indianwheat, woolly plantain								
Polemoniaceae – Phlox Family										
	Gilia brecciarum ssp. *brecciarum*	Nevada gilia								
	Gilia latifolia	broadleaf gilia								
	Gilia stellata	star gilia								
	Langloisia setosissima ssp. *setosissima*	bristly langloisia								
	Linanthus jonesii	Jones' linanthus								
	Loeseliastrum schottii	Schott's calico								
Polygonaceae – Buckwheat Family										
	Chorizanthe brevicornu var. *brevicornu*	brittle spineflower								
	Chorizanthe corrugata	wrinkled spineflower								
	Chorizanthe rigida	spiny-herb								
	Eriogonum inflatum	desert trumpet								
	Eriogonum reniforme	kidneyleaf buckwheat								
	Eriogonum thomasii	Thomas Eriogonum								
	Eriogonum trichopes	little deserttrumpet								
Resedaceae – Mignonette Family										
	Oligomeris linifolia	lineleaf whitepuff								
Rhamnaceae – Buckthorn Family										
	Colubrina californica	las animas colubrina								
	Ziziphus cf. *obtusifolia* var. *canescens*	graythorn								
Scrophulariaceae – Figwort Family										
	Antirrhinum filipes	twining snapdragon								
	Mohavea confertiflora	ghost flower								
Solanaceae – Nightshade Family										
	Lycium andersonii	water jacket, Anderson's desert thorn								
	Physalis hederifolia var. *fendleri*	Fendler's groundcherry								

Family	Scientific Name	Common Name	Phenology(ies)				Day(s)			
			D	V	B	F	M	T	W	Th
Tamaricaceae – Tamarisk Family										
	Tamarx sp. *	Tamarisk								
Viscaceae – Mistletoe Family										
	Phoradendron californicum	desert mistletoe								
Zygophyllaceae – Caltrop Family										
	Fagonia laevis	California fagonbush								
✓	*Larrea tridentata*	creosote bush		✓	✓	✓				
	Kallstroemia parviflora	warty caltrop								
RARE PLANT TARGET LIST										
	Acleisanthes longiflora	Angel trumpets								
	Androstephium breviflorum	small-flowered androstephium								
	Astragalus insularis var. harwoodii	Harwood's milkvetch								
	Astragalus lentiginosus var. coachellae	Coachella Valley milkvetch								
	Ayenia compacta	California ayenia								
	Calliandra eriophylla	Fairyduster								
	Calochortus striatus	Alkali mariposa-lily								
	Castela emoryi	Crucifixion thorn								
	Chamaesyce abramsiana	Abram's spurge								
	Chamaesyce platysperma	Flat-seeded spurge								
	Colubrina californica	Las Animas colubrine								
	Condalia globosa var. pubescens	bitter snakewood								
	Corypantha alversonii	Foxtail cactus								
	Cryptantha costata	ribbed cryptantha								
	Cryptantha holoptera	winged cryptantha								
	Cynanchum utahense	Utah milkvine								
	Ditaxis claryana	glandular ditaxis								
	Ditaxis serrata var. californica	California ditaxis								
	Echinocactus polycephalus var. polycephalus	cottontop cactus								
	Echinocereus engelmannii	hedgehog cactus								
	Echinocereus triglochidiatus	hedgehog cactus								
	Eriastrum harwoodii	Harwood's wollystar								
	Ferocactus cylindraceus	California barrel cactus								
	Horsfordia alata	pink velvet mallow								
	Hymenoxys odorata	bitter hymenoxys								
	Imperata brevifolia	California satintail								
	Matelea parvifolia	spearleaf								
	Mentzelia puberula	Argus blazing star								
	Physalis lobata	lobed ground cherry								
	Portulaca halimoides	desert portulaca								
	Proboscidea althaeifolia	desert unicorn plant								
	Salvia greatae	Orocopia sage								
	Selaginella eremophila	Desert spikemoss								
	Senna covesii	Coves' cassia								
	Teucrium cubense ssp. depressum	dwarf germander								

~~Jeanette~~, Avker, Erin

BLYTHE

Wash in Southern buffer

Fred Sproul 3-16-10

Family	Scientific Name	Common Name	Phenology(ies)				Day(s)			
			D	V	B	F	M	T	W	Th
GNETALES										
Ephedraceae – Ephedta Family										
	Ephedra sp.	ephedra								
MONOCOTS										
Poaceae – Grass Family										
	Aristida adscensionis	sixweeks threeawn								
	Aristida purpurea	purple threeawn								
	Bouteloua barbata var. *barbata*	sixweeks grama								
	Bromus madritensis ssp. *rubens**	red brome, foxtail chess								
	Erioneuron pulchellum (*syn. Dasyochloa pulchella*)	fluff grass								
	Pleuraphis rigida	big galleta grass		X						
	Schismus sp.*	Mediterranean grass			X					
	*Vulpia bromoides**	brome fescue								
	Vulpia octoflora	sixweeks fescue								
DICOTS										
Asclepiadaceae – Milkweed Family										
	Asclepias subulata	rush milkweed								
	Cynanchum utahense	Utah cynanchum								
	Sarcostemma cynanchoides ssp. *hartwegii*	climbing milkweed								
	Sarcostemma hirtellum	trailing townula, hairy milkweed			X					
Asteraceae – Sunflower Family										
	Adenophyllum porophylloides	San Felipe dyssodia								
	Ambrosia dumosa	burroweed , white bursage		X						
	Atrichoseris platyphylla	parachute plant , gravel ghost								
	Bebbia juncea var. *aspera*	sweetbush								
	Calycoseris wrightii	white tackstem								
	Chaenactis carphoclinia	pebble pincushion								
	Chaenactis stevioides	desert pincushion			X	X				
	Encelia farinosa	brittlebush, incienso		X	X					
	Encelia frutescens	button brittlebush								
	Geraea canescens	desert-sunflower								
	Hymenoclea salsola	cheesebush								
	Malacothrix glabrata	desert dandelion			X					
	Monoptilon bellioides	Mojave desertstar			X					
	Palafoxia arida var. *arida*	Spanish needle, desert palafox			X					
	Perityle emoryi	Emory's rockdaisy		X						
	Pectis papposa	chinchweed								
	Porophyllum gracile	odora								
	Prenanthella exigua	brightwhite								
	Rafinesquia neomexicana	desert chicory			X					
	Senecio mohavensis	Mojave ragwort, Mohave Groundsel								

Family	Scientific Name	Common Name	Phenology(ies)				Day(s)			
			D	V	B	F	M	T	W	Th
	Stephanomeria pauciflora var. *pauciflora*	wire lettuce								
	Trichoptilium incisum	yellowhead, yellowdome		X						
	Trixis californica var. *californica*	American threefold								
Boraginaceae – Borage Family										
	Amsinckia menziesii var. *menziesii*	rancher's fireweed								
	Cryptantha angustifolia	narrow leaved cryptantha			X	X				
	Cryptantha barbigera	bearded cryptantha								
	Cryptantha costata	ribbed cryptantha								
	Cryptantha maritima	Guadalupe cryptantha			X	X				
	Cryptantha pterocarya	wingnut cryptantha								
	Pectocarya penicillata	chuckwalla combseed								
	Pectocarya platycarpa	broadfruit combseed			X	X				
	Tiquilia plicata	fanleaf crinklemat, plicate coldenia								
Brassicaceae – Mustard Family										
	*Brassica tournefortii**	Saharan mustard, Sahara mustard			X	X				
	Dithyrea californica	spectacle-pod								
	Guillenia lasiophyllum	California mustard			X	X				
	Lepidium ~~sp.~~ dictyotum	pepperweed			X	X				
	Tropidocarpum gracile	dobie pod								
Cactaceae – Cactus Family										
	Echinocactus polycephalus var. *polycephalus*	cottontop cactus, clustered barrel cactus								
	Ferocactus cylindraceus var. *cylindraceus*	California barrel cactus								
	Mammillaria tetrancistra	common fishhook cactus		X						
	Opuntia basilaris	beavertail cactus		X						
	Opuntia echinocarpa (*Cylindropuntia e.*)	silver cholla, golden cholla		X						
	Opuntia ramosissima (*Cylindropuntia r.*)	pencil cactus, diamond cholla								
Chenopodiaceae – Goosefoot Family										
	Atriplex polycarpa	allscale saltbrush								
	Atriplex hymenelytra	desert holly								
	Chenopodium murale	nettleleaf goosefoot								
	Chenopodium sp.	goosefoot								
	*Salsola tragus**	Russian thistle, tumbleweed								
Cucurbitaceae – Gourd Family										
	Brandegea bigelovii	desert starvine								
Euphorbiaceae – Spurge Family										
	Chamaesyce polycarpa	smallseed sandmat		X						
	Ditaxis lanceolata	Narrowleaf ditaxis, narrowleaf silverbush								
	Ditaxis neomexicana	New Mexico ditaxis								

Family	Scientific Name	Common Name	Phenology(ies)				Day(s)			
			D	V	B	F	M	T	W	Th
	Euphorbia eriantha	beetle spurge								
Fabaceae – Legume Family										
	Acacia gregii	catclaw		X						
	Astragalus nuttallianus var. *imperfectus*	turkey peas								
	Astragalus insularis var. *harwoodii*	Harwood's milkvetch								
	Cercidium floridium ssp. *floridium*	blue palo verde		X						
	Dalea mollis	silky dalea, hairy prairie clover								
	Lotus wrangelianus	Chilean bird's-foot trefoil								
	Lupinus cf. *arizonicus*	Arizona lupine								
	Marina parryi	Parry's false prairie clover			X					
	Olneya tesota	ironwood		X						
	Prosopis glandulosa	honey mesquite								
	Psorothamnus spinosum	smoke tree								
	Senna armata	spiny senna, desert senna								
Fouquieriaceae – Ocotillo Family										
	Fouquieria splendens ssp. *splendens*	ocotillo		X						
Geraniaceae – Geranium Family										
	Erodium texanum	Texas storksbill, Desert Heron's Bill			X	X				
Hydrophyllaceae – Waterleaf Family										
	Eucrypta micrantha	dainty desert hideseed								
	Nama demissum var. *demissum*	purplemat								
	Phacelia crenulata var. *ambigua*	purplestem phacelia			X	X				
	Phacelia crenulata var. *minutiflora*	cleftleaf wildheliotrope								
Krameriaceae – Rhatany Family										
	Krameria erecta	Pima rharany, littleleaf ratany								
	Krameria grayi	white rhatany		X	X					
Lamiaceae – Mint Family										
	Hyptis emoryi	desert-lavender		X	X					
Loasaceae – Loasa Family										
	Mentzelia cf. *albicaulis*	small flowered blazing star, white stemmed stickleaf								
	Mentzelia involucrata	whitebract blazingstar		X						
Malvaceae – Mallow Family										
	Eremalche rotundifolia	desert five-spot								
	Hibiscus denudatus	paleface								
	Sphaeralcea ambigua	desert globemallow , apricot mallow								
Martyniaceae – Unicorn-Plant Family										
	Proboscidea althaeifolia	desert unicorn-plant								
Nyctaginaceae – Four O'Clock Family										

Family	Scientific Name	Common Name	Phenology(ies)				Day(s)			
			D	V	B	F	M	T	W	Th
	Allionia incarnata	trailing allionia, windmills								
Onagraceae – Evening Primrose Family										
	Camissonia boothii ssp. *desertorum*	desert suncup								
	Camissonia brevipes ssp. *brevipes*	golden suncup								
	Camissonia cf. *cardiophylla*	heartleaf suncup								
	Camissonia claviformis	browneyes								
	Camissonia refracta	narrowleaf suncup								
Papaveraceae – Poppy Family										
	Eschscholzia glyptosperma	desert poppy , desert golden poppy			X					
	Eschscholzia minutiflora	pygmy poppy, Coville's poppy			X					
Plantaginaceae – Plantain Family										
	Plantago ovata	desert Indianwheat, woolly plantain				X				
Polemoniaceae – Phlox Family										
	Gilia brecciarum ssp. *brecciarum*	Nevada gilia								
	Gilia latifolia	broadleaf gilia								
	Gilia stellata	star gilia			X					
	Langloisia setosissima ssp. *setosissima*	bristly langloisia								
	Linanthus jonesii	Jones' linanthus			X					
	Loeseliastrum schottii	Schott's calico								
Polygonaceae – Buckwheat Family										
	Chorizanthe brevicornu var. *brevicornu*	brittle spineflower		X						
	Chorizanthe corrugata	wrinkled spineflower		X						
	Chorizanthe rigida	spiny-herb		X						
	Eriogonum inflatum	desert trumpet		X						
	Eriogonum reniforme	kidneyleaf buckwheat								
	Eriogonum thomasii	Thomas Eriogonum		X						
	Eriogonum trichopes	little deserttrumpet								
Resedaceae – Mignonette Family										
	Oligomeris linifolia	lineleaf whitepuff		X						
Rhamnaceae – Buckthorn Family										
	Colubrina californica	las animas colubrina								
	Ziziphus cf. *obtusifolia* var. *canescens*	graythorn								
Scrophulariaceae – Figwort Family										
	Antirrhinum filipes	twining snapdragon								
	Mohavea confertiflora	ghost flower			X					
Solanaceae – Nightshade Family										
	Lycium andersonii	water jacket, Anderson's desert thorn			X					
	Physalis hederifolia var. *fendleri*	Fendler's groundcherry								

Family	Scientific Name	Common Name	Phenology(ies)				Day(s)			
			D	V	B	F	M	T	W	Th
Tamaricaceae – Tamarisk Family										
	Tamarx sp. *	Tamarisk								
Viscaceae – Mistletoe Family										
	Phoradendron californicum	desert mistletoe								
Zygophyllaceae – Caltrop Family										
	Fagonia laevis	California fagonbush								
	Larrea tridentata	creosote bush			X	X				
	Kallstroemia parviflora	warty caltrop								
RARE PLANT TARGET LIST										
	Acleisanthes longiflora	Angel trumpets								
	Androstephium breviflorum	small-flowered androstephium								
	Astragalus insularis var. harwoodii	Harwood's milkvetch								
	Astragalus lentiginosus var. coachellae	Coachella Valley milkvetch								
	Ayenia compacta	California ayenia								
	Calliandra eriophylla	Fairyduster								
	Calochortus striatus	Alkali mariposa-lily								
	Castela emoryi	Crucifixion thorn								
	Chamaesyce abramsiana	Abram's spurge								
	Chamaesyce platysperma	Flat-seeded spurge								
	Colubrina californica	Las Animas colubrine								
	Condalia globosa var. pubescens	bitter snakewood								
	Corypantha alversonii	Foxtail cactus								
	Cryptantha costata	ribbed cryptantha								
	Cryptantha holoptera	winged cryptantha								
	Cynanchum utahense	Utah milkvine								
	Ditaxis claryana	glandular ditaxis								
	Ditaxis serrata var. californica	California ditaxis								
	Echinocactus polycephalus var. polycephalus	cottontop cactus								
	Echinocereus engelmannii	hedgehog cactus								
	Echinocereus triglochidiatus	hedgehog cactus								
	Eriastrum harwoodii	Harwood's wollystar								
	Ferocactus cylindraceus	California barrel cactus								
	Horsfordia alata	pink velvet mallow								
	Hymenoxys odorata	bitter hymenoxys								
	Imperata brevifolia	California satintail								
	Matelea parvifolia	spearleaf								
	Mentzelia puberula	Argus blazing star								
	Physalis lobata	lobed ground cherry								
	Portulaca halimoides	desert portulaca								
	Proboscidea althaeifolia	desert unicorn plant								
	Salvia greatae	Orocopia sage								
	Selaginella eremophila	Desert spikemoss								
	Senna covesii	Coves' cassia								
	Teucrium cubense ssp. depressum	dwarf germander								

Family	Scientific Name	Common Name	Phenology(ies)				Day(s)			
			D	V	B	F	M	T	W	Th
	Wislizenia refracta ssp. refracta	Jackass clover								
	Xylorhiza orcuttii	Orcutt's Woody-aster								
OTHER SPECIES NEW TO LIST										
	Dalea mollisima			X						
	Cryptantha nevadensis				X					
	Lotus strigosus				X					
	Hesperoxalis undulata			X						
	Linanthus jonesii					X				
	Plagiobothrys jonesii			X						
	Asclepias			X						
	Phacelia neglecta									
Camissonia claviformis x brevipes					X					

* Nonnative species

Plant list for
Fred Sproul
Ted St. John
4/20, 21 /10

Garmin # 8 Ted
Garmin # 12 Fred

BLYTHE

INSTRUCTIONS: Please mark the plant species you see, including the day(s) of observation and the phenology(ies) observed. Mark the DOMINANT phenology with an "X", and all other observed phonologies with an "O". ✓ – TRANSOUSSING LINE

There is additional room for new species at the bottom of each list. X – 2ND TRACK

If you observe a species that you are not sure of… please collect it! If you can't collect it because it is not fruiting, etc. or the population is too small, then photograph it! Take it back to the motel and key the darn thing if you can. It is on, or may be on, our rare plant hit list. ☺

Phenology Codes: D = Dead/Dormant, V = Vegetative, B = Blooming, F = Fruiting

Family	Scientific Name	Common Name	Phenology(ies)				Day(s)			
			D	V	B	F	M	T	W	Th
		GNETALES								
Ephedraceae – Ephedta Family										
	Ephedra sp.	ephedra								
		MONOCOTS								
Agavaceae – Century Plant Family										
	Hesperocallis undulata	desertlily				✓		✓		
Poaceae – Grass Family										
	Aristida adscensionis	sixweeks threeawn								
	Aristida purpurea	purple threeawn								
	Bouteloua barbata var. *barbata*	sixweeks grama								
	Bromus madritensis ssp. *rubens**	red brome, foxtail chess								
	Erioneuron puichellum (syn. *Dasyochloa pulchella*)	fluff grass								
	Pleuraphis rigida	big galleta grass				✓		✓	✓X	
	*Schismus arabicus**	Mediterranean grass				✓		✓	✓X	
	*Vulpia bromoides**	brome fescue				~~X~~		~~X~~		
	Vulpia octoflora	sixweeks fescue								
		DICOTS								
Asclepiadaceae – Milkweed Family										
	Asclepias subulata	rush milkweed		✓				✓		
	Cynanchum utahense	Utah cynanchum								
	Sarcostemma cynanchoides	climbing milkweed								

AMARANTHUS SP.

Family	Scientific Name	Common Name	Phenology(ies)				Day(s)			
			D	V	B	F	M	T	W	Th
	ssp. *hartwegii*									
	Sarcostemma hirtellum	trailing townula, hairy milkweed								
Asteraceae – Sunflower Family										
	Adenophyllum porophylloides	San Felipe dyssodia								
	Ambrosia dumosa	burroweed , white bursage			✓	✓		✓	✓✗	
	Atrichoseris platyphylla	parachute plant , gravel ghost								
	Bebbia juncea var. *aspera*	sweetbush			✓	✓		✓		
	Calycoseris wrightii	white tackstem								
	Chaenactis carphoclinia	pebble pincushion								
	Chaenactis stevioides	desert pincushion			✓	✓		✓	✓	
	Encelia farinosa var. farinosa	brittlebush, incienso							✓	
	Encelia farinosa var. phenicodonta	dark-eyed brittlebush			✓	✓		✓	✓✗	
	Encelia frutescens	button brittlebush								
	Geraea canescens	desert-sunflower					✓	✓	✓✗	
	Hymenoclea salsola	cheesebush							✗	
	Malacothrix glabrata	desert dandelion			✓			✓	✓✗	
	Monoptilon bellioides	Mojave desertstar			✓			✓	✓	
	Palafoxia arida var. *arida*	Spanish needle, desert palafox			✓			✓	✓	
	Perityle emoryi	Emory's rockdaisy							✗	
	Pectis papposa	chinchweed								
	Porophyllum gracile	odora								
	Prenanthella exigua	brightwhite								
	Rafinesquia neomexicana	desert chicory			✓	✓		✓	✗✓	
	Senecio mohavensis	Mojave ragwort, Mohave Groundsel								
	Stephanomeria exigua	small wire lettuce								
	Stephanomeria pauciflora var. *pauciflora*	wire lettuce			✓			✓	✓	
	Trichoptilium incisum	yellowhead, yellowdome								
	Trixis californica var. *californica*	American threefold								
		VELVET TURRETICK			✓				✓	
	Lactuca serriola									
Boraginaceae – Borage Family										
	Amsinckia menziesii var. *menziesii*	rancher's fireweed								
	Amsinckia tessellata	fiddleneck								

Family	Scientific Name	Common Name	Phenology(ies)				Day(s)			
			D	V	B	F	M	T	W	Th
	Cryptantha angustifolia	narrow leaved cryptantha			✓	✓		✓	✓X	
	Cryptantha barbigera	bearded cryptantha								
	Cryptantha costata	ribbed cryptantha							X	
	Cryptantha holoptera	winged cyptantha								
	Cryptantha maritima var. maritima	Guadalupe cryptantha				✓		✓	X	
	Cryptantha maritima var. pilosa	Guadalupe cryptantha								
	Cyptantha nevadensis var. nevadensis	Nevada catseye							X	
	Cryptantha pterocarya var. cycloptera	wingnut cryptantha							X	
	Pectocarya penicillata	chuckwalla combseed								
	Pectocarya platycarpa	broadfruit combseed								
	Pectocarya recurvata	curvenut combseed, combur								
	Plagiobothrys jonesii	Mojave popcornflower							X	
	Tiquilia palmeri	Palmer's coldenia								
	Tiquilia plicata	fanleaf crinklemat, plicate coldenia								
	Pect. platycarpa								X	
Brassicaceae – Mustard Family										
	*Brassica tournefortii**	Saharan mustard, Sahara mustard				✓		✓	✓X	
	Dithyrea californica	spectacle-pod								
	Guillenia lasiophyllum	California mustard								
	Lepidium lasiocarpum	pepperweed				✓		✓	✓X	
	*Sisymbrium irio**	London rocket								
	Tropidocarpum gracile	dobie pod								
Cactaceae – Cactus Family										
	Echinocactus polycephalus var. *polycephalus*	cottontop cactus, clustered barrel cactus								
	Ferocactus cylindraceus var. *cylindraceus*	California barrel cactus								

Family	Scientific Name	Common Name	Phenology(ies)				Day(s)			
			D	V	B	F	M	T	W	Th
	Mammillaria tetrancistra	common fishhook cactus								
	Opuntia basilaris	beavertail cactus								
	Opuntia echinocarpa (*Cylindropuntia e.*)	silver cholla, golden cholla		✓				✓	✓	
	Opuntia ramosissima (*Cylindropuntia r.*)	pencil cactus, diamond cholla								
	Nemacladus	threadplant								
CAMPANULACEAE										
CARYOPHYLLACEAE										
	ACHYRONYCHIA	COOPERI			✓			✓		
Chenopodiaceae – Goosefoot Family										
	Atriplex polycarpa	allscale saltbrush								
	Atriplex hymenelytra	desert holly								
	Chenopodium murale	nettleleaf goosefoot								
	Chenopodium sp.	goosefoot								
	*Salsola tragus**	Russian thistle, tumbleweed								
Cucurbitaceae – Gourd Family										
	Brandegea bigelovii	desert starvine							✓	
Euphorbiaceae – Spurge Family										
	Chamaesyce polycarpa	smallseed sandmat				✓		✓	✓	
	Ditaxis lanceolata	Narrowleaf ditaxis, narrowleaf silverbush								
	Ditaxis neomexicana	New Mexico ditaxis							✓	
	Euphorbia eriantha	beetle spurge								
	STILLINGIA spinulosa				✓			✓		
Fabaceae – Legume Family										
	Acacia gregii	catclaw								
	Astragalus nuttallianus var. *imperfectus*	turkey peas								
	Astragalus insularis var. *harwoodii*	Harwood's milkvetch								
	Cercidium floridium ssp. *floridium*	blue palo verde							✓	
	Dalea mollis	silky dalea, hairy prairie clover								

Family	Scientific Name	Common Name	Phenology(ies)				Day(s)			
			D	V	B	F	M	T	W	Th
	Dalea mollissima	hairy dalea, downy dalea							✓	
	Lotus strigosus var. tomentellus	strigose bird's-foot trefoil			✓			✓	✓	
	Lotus wrangelianus	Chilean bird's-foot trefoil								
	Lupinus cf. *arizonicus*	Arizona lupine				✓		✓		
	Marina parryi	Parry's false prairie clover			✓				✓	
	Olneya tesota	ironwood						✓	✓	
	Prosopis glandulosa	honey mesquite							✓	
	Psorothamnus spinosum S	smoke tree						✓	X	
	Senna armata	spiny senna, desert senna								
Fouquieriaceae – Ocotillo Family										
	Fouquieria splendens ssp. *splendens*	ocotillo								
Geraniaceae – Geranium Family										
	Erodium texanum	Texas storksbill, Desert Heron's Bill				✓		✓		
Hydrophyllaceae – Waterleaf Family										
	Eucrypta micrantha	dainty desert hideseed								
	Nama demissum var. *demissum*	purplemat								
	Phacelia crenulata var. *ambigua*	purplestem phacelia								
	Phacelia crenulata var. *minutiflora*	cleftleaf wildheliotrope			✓	✓		✓	✓	
	Phacelia neglecta	alkali phacelia								
Krameriaceae – Rhatany Family										
	Krameria erecta	Pima rharany, littleleaf ratany								
	Krameria grayi	white rhatany			✓	✓		✓	✓	

Family	Scientific Name	Common Name	Phenology(ies)				Day(s)			
			D	V	B	F	M	T	W	Th
Lamiaceae – Mint Family										
	Hyptis emoryi	desert-lavender								
Loasaceae – Loasa Family										
	Mentzelia cf. *albicaulis*	small flowered blazing star, white stemmed stickleaf								
	Mentzelia involucrata	whitebract blazingstar							X	
Malvaceae – Mallow Family										
	Eremalche rotundifolia	desert five-spot			✓			✓		
	Hibiscus denudatus	paleface								
	Sphaeralcea ambigua	desert globemallow , apricot mallow								
Martyniaceae – Unicorn-Plant Family										
	Proboscidea althaeifolia	desert unicorn-plant								
Nyctaginaceae – Four O'Clock Family										
	Abronia villosa var. *villosa*	desert sand verbena			✓			✓	✓X	
	Allionia incarnata	trailing allionia, windmills								
	Boerhavia	spiderling								
	Mirabilis bigelovii	wishbone bush								
Onagraceae – Evening Primrose Family										
	Camissonia boothii ssp. *desertorum*	desert suncup			✓	✓		✓	✓	
	Camissonia brevipes ssp. *brevipes*	golden suncup								
	Camissonia cf. *cardiophylla*	heartleaf suncup								
	Camissonia claviformis	browneyes							X	
	Camissonia refracta	narrowleaf suncup								
	OENOTHERA PRIMIVERA					✓		✓		

Family	Scientific Name	Common Name	Phenology(ies)				Day(s)			
			D	V	B	F	M	T	W	Th
Papaveraceae – Poppy Family										
	Eschscholzia glyptosperma	desert poppy , desert golden poppy								
	Eschscholzia minutiflora	pygmy poppy, Coville's poppy			✓			✓	✓	
Plantaginaceae – Plantain Family										
	Plantago ovata	desert Indianwheat, woolly plantain			✓			✓	✓	
Polemoniaceae – Phlox Family										
	Gilia brecciarum ssp. *brecciarum*	Nevada gilia								
	Gilia latifolia	broadleaf gilia								
	Gilia stellata	star gilia								
	Langloisia setosissima ssp. *setosissima*	bristly langloisia						✓	✓	
	Linanthus jonesii	Jones' linanthus								
	Loeseliastrum schottii	Schott's calico								
Polygonaceae – Buckwheat Family										
	Chorizanthe brevicornu var. *brevicornu*	brittle spineflower				✓		✓		
	Chorizanthe corrugata	wrinkled spineflower								
	Chorizanthe rigida	spiny-herb						✓		
	Eriogonum inflatum var. *inflatum*	desert trumpet								
	Eriogonum reniforme	kidneyleaf buckwheat								
	Eriogonum thomasii	Thomas Eriogonum				✓		✓	✓	
	Eriogonum trichopes	little deserttrumpet								

Family	Scientific Name	Common Name	Phenology(ies)				Day(s)			
			D	V	B	F	M	T	W	Th
Resedaceae – Mignonette Family										
	Oligomeris linifolia	lineleaf whitepuff							X	
Rhamnaceae – Buckthorn Family										
	Colubrina californica	las animas colubrina								
	Ziziphus cf. *obtusifolia* var. *canescens*	graythorn								
Scrophulariaceae – Figwort Family										
	Antirrhinum filipes	twining snapdragon								
	Mohavea confertiflora	ghost flower								
Solanaceae – Nightshade Family										
	Lycium andersonii	water jacket, Anderson's desert thorn							✓	
	Physalis hederifolia var. *fendleri*	Fendler's groundcherry								
Tamaricaceae – Tamarisk Family										
	Tamarix sp. *	Tamarisk								
Viscaceae – Mistletoe Family										
	Phoradendron californicum	desert mistletoe								
Zygophyllaceae – Caltrop Family										
	Fagonia laevis	California fagonbush						✓		
	Larrea tridentata	creosote bush			✓	✓		✓	✓ X	
	Kallstroemia parviflora	warty caltrop								
RARE PLANT TARGET LIST										
	Acleisanthes longiflora	Angel trumpets								
	Androstephium breviflorum	small-flowered androstephium								
	Astragalus insularis var. harwoodii	Harwood's milkvetch								
	Astragalus lentiginosus var. coachellae	Coachella Valley milkvetch								
	Ayenia compacta	California ayenia								
	Calliandra eriophylla	Fairyduster								

BLYTHE SOLAR POWER PROJECT

SPRING 2010 BOTANICAL SURVEYS

SCAN DETAILS

Surveyor	Duffels, Jeanette
Scanned By	Harper, Kyle
Scan Date	05.17.2010

WEEK OF 3/15/2010 BLYTHE GO J Duffels

Family	Scientific Name	Common Name	Phenology(ies)				Day(s)			
			D	V	B	F	M	T	W	Th
	GNETALES									
Ephedraceae – Ephedta Family										
	Ephedra sp.	ephedra								
	MONOCOTS									
Poaceae – Grass Family										
	Aristida adscensionis	sixweeks threeawn								
	Aristida purpurea	purple threeawn								
	Bouteloua barbata var. *barbata*	sixweeks grama								
	Bromus madritensis ssp. *rubens**	red brome, foxtail chess								
	Erioneuron pulchellum (*syn. Dasyochloa pulchella*)	fluff grass								
	Pleuraphis rigida	big galleta grass	✓			✓	✓	✓	✓	✓
	Schismus sp.* arabicus?	Mediterranean grass			✓		✓	✓	✓	✓
	*Vulpia bromoides**	brome fescue								
	Vulpia octoflora	sixweeks fescue								
	DICOTS									
Asclepiadaceae – Milkweed Family										
	Asclepias subulata	rush milkweed			✓			✓		
	Cynanchum utahense	Utah cynanchum								✓
	Sarcostemma cynanchoides ssp. *hartwegii*	climbing milkweed			✓			✓		✓
	Sarcostemma hirtellum	trailing townula, hairy milkweed								✓
Asteraceae – Sunflower Family										
	Adenophyllum porophylloides	San Felipe dyssodia								
	Ambrosia dumosa	burroweed , white bursage	✓	✓	✓		✓	✓	✓	✓
	Atrichoseris platyphylla	parachute plant , gravel ghost		✓				✓		
	Bebbia juncea var. *aspera*	sweetbush		✓	✓			✓		
	Calycoseris wrightii	white tackstem					✓	✓	✓	✓
	Chaenactis carphoclinia	pebble pincushion			✓		✓	✓	✓	
	Chaenactis stevioides	desert pincushion			✓			✓	✓	✓
	Encelia farinosa	brittlebush, incienso						✓		✓
	Encelia frutescens	button brittlebush			✓					✓
	Geraea canescens	desert-sunflower		✓	✓		✓	✓	✓	✓
	Hymenoclea salsola	cheesebush								✓
	Malacothrix glabrata	desert dandelion						✓	✓	✓
	Monoptilon bellioides	Mojave desertstar			✓			✓	✓	
	Palafoxia arida var. *arida*	Spanish needle, desert palafox		✓	✓		✓		✓	✓
	Perityle emoryi	Emory's rockdaisy		✓				✓		
	Pectis papposa	chinchweed								
	Porophyllum gracile	odora								
	Prenanthella exigua	brightwhite								
	Rafinesquia neomexicana	desert chicory			✓		✓	✓	✓	✓
	Senecio mohavensis	Mojave ragwort, Mohave Groundsel								

Family	Scientific Name	Common Name	Phenology(ies)				Day(s)			
			D	V	B	F	M	T	W	Th
	Stephanomeria pauciflora var. *pauciflora*	wire lettuce								
	Trichoptilium incisum	yellowhead, yellowdome		✓	✓			✓		
	Trixis californica var. *californica*	American threefold								
Boraginaceae – Borage Family										
	Amsinckia menziesii var. *menziesii*	rancher's fireweed							✓	✓
	Cryptantha angustifolia	narrow leaved cryptantha			✓	✓	✓	✓	✓	✓
	Cryptantha barbigera	bearded cryptantha							✓	
	Cryptantha costata	ribbed cryptantha		✓	✓	✓	✓			
	Cryptantha maritima	Guadalupe cryptantha			✓		✓	✓	✓	✓
	Cryptantha pterocarya cycloptera	wingnut cryptantha			✓	✓	✓	✓	✓	
	Pectocarya penicillata	chuckwalla combseed						✓	✓	
	Pectocarya platycarpa	broadfruit combseed			✓	✓	✓	✓	✓	✓
	Tiquilia plicata	fanleaf crinklemat, plicate coldenia		✓			✓			
Brassicaceae – Mustard Family										
	*Brassica tournefortii**	Saharan mustard, Sahara mustard			✓		✓	✓	✓	✓
	Dithyrea californica	spectacle-pod			✓	✓	✓			✓
	Guillenia lasiophyllum	California mustard							✓	
	Lepidium sp. dictiotum dictiotum	pepperweed			✓	✓	✓	✓	✓	✓
	Tropidocarpum gracile	dobie pod								
Cactaceae – Cactus Family										
	Echinocactus polycephalus var. *polycephalus*	cottontop cactus, clustered barrel cactus								
	Ferocactus cylindraceus var. *cylindraceus*	California barrel cactus						✓		
	Mammillaria tetrancistra	common fishhook cactus		✓				✓		
	Opuntia basilaris	beavertail cactus								
	Opuntia echinocarpa (*Cylindropuntia e.*)	silver cholla, golden cholla		✓			✓	✓	✓	✓
	Opuntia ramosissima (*Cylindropuntia r.*)	pencil cactus, diamond cholla								
Chenopodiaceae – Goosefoot Family										
	Atriplex polycarpa	allscale saltbrush								
	Atriplex hymenelytra	desert holly								
	Chenopodium murale	nettleleaf goosefoot								
	Chenopodium sp.	goosefoot								
	*Salsola tragus**	Russian thistle, tumbleweed		✓			✓			
Cucurbitaceae – Gourd Family										
	Brandegea bigelovii	desert starvine							✓	✓
Euphorbiaceae – Spurge Family										
	Chamaesyce polycarpa	smallseed sandmat		✓			✓			
	Ditaxis lanceolata	Narrowleaf ditaxis, narrowleaf silverbush							✓	
	Ditaxis neomexicana	New Mexico ditaxis		✓	✓			✓		

Family	Scientific Name	Common Name	Phenology(ies)				Day(s)			
			D	V	B	F	M	T	W	Th
	Euphorbia eriantha	beetle spurge								
Fabaceae – Legume Family										
	Acacia gregii	catclaw		✓				✓	✓	
	Astragalus nuttallianus var. *imperfectus*	turkey peas								
	Astragalus insularis var. *harwoodii*	Harwood's milkvetch			✓	✓	✓			
	Cercidium floridium ssp. *floridium*	blue palo verde						✓		
	Dalea mollis	silky dalea, hairy prairie clover	✓				✓		✓	
	Lotus wrangelianus	Chilean bird's-foot trefoil								
	Lupinus cf. *arizonicus*	Arizona lupine		✓	✓			✓	✓	
	Marina parryi	Parry's false prairie clover		✓				✓	Also	
	Olneya tesota	ironwood						✓	✓	
	Prosopis glandulosa	honey mesquite								
	Psorothamnus spinosum	smoke tree								
	Senna armata	spiny senna, desert senna								
Fouquieriaceae – Ocotillo Family										
	Fouquieria splendens ssp. *splendens*	ocotillo			✓		✓	✓		✓
Geraniaceae – Geranium Family										
	Erodium texanum	Texas storksbill, Desert Heron's Bill		✓				✓	✓	✓
Hydrophyllaceae – Waterleaf Family										
	Eucrypta micrantha	dainty desert hideseed			✓				✓	✓
	Nama demissum var. *demissum*	purplemat				✓		✓	✓	
	Phacelia crenulata var. *ambigua*	purplestem phacelia			✓		✓	✓	✓ Also	✓
	Phacelia crenulata var. *minutiflora*	cleftleaf wildheliotrope								
Krameriaceae – Rhatany Family										
	Krameria erecta	Pima rharany, littleleaf ratany								
	Krameria grayi	white rhatany				✓		✓	✓	✓
Lamiaceae – Mint Family										
	Hyptis emoryi	desert-lavender		✓					✓	
Loasaceae – Loasa Family										
	Mentzelia cf. *albicaulis*	small flowered blazing star, white stemmed stickleaf			✓		✓	✓		
	Mentzelia involucrata	whitebract blazingstar		✓	✓		✓	✓		
Malvaceae – Mallow Family										
	Eremalche rotundifolia	desert five-spot		✓	✓			✓	✓	✓
	Hibiscus denudatus	paleface								
	Sphaeralcea ambigua	desert globemallow , apricot mallow		✓				✓		
Martyniaceae – Unicorn-Plant Family										
	Proboscidea althaeifolia	desert unicorn-plant								
Nyctaginaceae – Four O'Clock Family										

Family	Scientific Name	Common Name	Phenology(ies)				Day(s)			
			D	V	B	F	M	T	W	Th
	Allionia incarnata	trailing allionia, windmills								
Onagraceae – Evening Primrose Family										
	Camissonia boothii ssp. *desertorum*	desert suncup								
	Camissonia brevipes ssp. *brevipes*	golden suncup			✓				✓	
	Camissonia cf. *cardiophylla*	heartleaf suncup								
	Camissonia claviformis (claviformis)	browneyes						✓	✓	✓
	Camissonia refracta	narrowleaf suncup							✓	✓
Papaveraceae – Poppy Family										
	Eschscholzia glyptosperma	desert poppy , desert golden poppy			✓			✓	✓	
	Eschscholzia minutiflora	pygmy poppy, Coville's poppy			✓			✓	✓	
Plantaginaceae – Plantain Family										
	Plantago ovata	desert Indianwheat, woolly plantain		✓	✓		✓	✓	✓	✓
Polemoniaceae – Phlox Family										
	Gilia brecciarum ssp. *brecciarum*	Nevada gilia								
	Gilia latifolia	broadleaf gilia								
	Gilia stellata	star gilia								
	Langloisia setosissima ssp. *setosissima*	bristly langloisia		✓				✓		
	Linanthus jonesii	Jones' linanthus								
	Loeseliastrum schottii	Schott's calico								
Polygonaceae – Buckwheat Family										
	Chorizanthe brevicornu var. *brevicornu*	brittle spineflower	✓		✓		✓	✓	✓	✓
	Chorizanthe corrugata	wrinkled spineflower								
	Chorizanthe rigida	spiny-herb	✓	✓			✓	✓	✓	
	Eriogonum inflatum	desert trumpet			✓			✓	✓	
	Eriogonum reniforme	kidneyleaf buckwheat								
	Eriogonum thomasii	Thomas Eriogonum								
	Eriogonum trichopes	little deserttrumpet								
Resedaceae – Mignonette Family										
	Oligomeris linifolia	lineleaf whitepuff								
Rhamnaceae – Buckthorn Family										
	Colubrina californica	las animas colubrina								
	Ziziphus cf. *obtusifolia* var. *canescens*	graythorn								
Scrophulariaceae – Figwort Family										
	Antirrhinum filipes	twining snapdragon								
	Mohavea confertiflora	ghost flower		✓	✓			✓		
Solanaceae – Nightshade Family										
	Lycium andersonii	water jacket, Anderson's desert thorn			✓			✓	✓	✓
	Physalis hederifolia var. *fendleri*	Fendler's groundcherry								

Family	Scientific Name	Common Name	Phenology(ies)				Day(s)			
			D	V	B	F	M	T	W	Th
Tamaricaceae – Tamarisk Family										
	Tamarx sp. *	Tamarisk								
Viscaceae – Mistletoe Family									✓	✓
	Phoradendron californicum	desert mistletoe								
Zygophyllaceae – Caltrop Family										
	Fagonia laevis	California fagonbush		✓				✓	✓	✓
	Larrea tridentata	creosote bush		✓	✓		✓	✓	✓	✓
	Kallstroemia parviflora	warty caltrop								
RARE PLANT TARGET LIST										
	Acleisanthes longiflora	Angel trumpets								
	Androstephium breviflorum	small-flowered androstephium								
	Astragalus insularis var. harwoodii	Harwood's milkvetch		✓	✓	✓	✓			
	Astragalus lentiginosus var. coachellae	Coachella Valley milkvetch								
	Ayenia compacta	California ayenia								
	Calliandra eriophylla	Fairyduster								
	Calochortus striatus	Alkali mariposa-lily								
	Castela emoryi	Crucifixion thorn								
	Chamaesyce abramsiana	Abram's spurge								
	Chamaesyce platysperma	Flat-seeded spurge								
	Colubrina californica	Las Animas colubrine								
	Condalia globosa var. pubescens	bitter snakewood								
	Corypantha alversonii	Foxtail cactus								
	Cryptantha costata	ribbed cryptantha		✓	✓		✓			
	Cryptantha holoptera	winged cryptantha								
	Cynanchum utahense	Utah milkvine								✓
	Ditaxis claryana	glandular ditaxis								
	Ditaxis serrata var. californica	California ditaxis								
	Echinocactus polycephalus var. polycephalus	cottontop cactus								
	Echinocereus engelmannii	hedgehog cactus								
	Echinocereus triglochidiatus	hedgehog cactus								
	Eriastrum harwoodii	Harwood's wollystar								
	Ferocactus cylindraceus	California barrel cactus								
	Horsfordia alata	pink velvet mallow								
	Hymenoxys odorata	bitter hymenoxys								
	Imperata brevifolia	California satintail								
	Matelea parvifolia	spearleaf								
	Mentzelia puberula	Argus blazing star								
	Physalis lobata	lobed ground cherry								
	Portulaca halimoides	desert portulaca								
	Proboscidea althaeifolia	desert unicorn plant								
	Salvia greatae	Orocopia sage								
	Selaginella eremophila	Desert spikemoss								
	Senna covesii	Coves' cassia								
	Teucrium cubense ssp. depressum	dwarf germander								

Family	Scientific Name	Common Name	Phenology(ies)				Day(s)			
			D	V	B	F	M	T	W	Th
	Wislizenia refracta ssp. refracta	Jackass clover								
	Xylorhiza orcuttii	Orcutt's Woody-aster								
OTHER SPECIES NEW TO LIST										
	Stephanomeria exigua				✓		✓			
	Abronia villosa				✓		✓		✓	✓
	Chaenactis glabrata				✓		✓	✓	✓	
		desert lily		✓			✓	✓		✓
	Oenothera deltoides				✓		✓			
	Baileya pauciradiata			✓	✓		✓			
	Erlastrum sp.			✓			✓	✓	✓	✓
	Astragalus sp. (white)				✓		✓			
	Dicioria canescens canescens			✓			✓			
	Stillingia spinulosa			✓			✓			
	Strephanella longirostrus			✓		✓	✓			
		tackstem			✓		✓	✓	✓	✓
	Cammissonia claviformis				✓		✓			
	Aristida sp. (californica?)		✓					✓		
	Chorizanthe brevicornu			✓			✓			
	Chorizanthe rigida		✓	✓			✓			
	Phacelia neglecta			✓	✓		✓	✓	✓	
	Lotus strigosus tomentalis				✓		✓	✓	✓	✓
	Astragalus didymocarpus			✓	✓		✓	✓		
	Eriogonum sp. (annual)							✓	✓	✓
	Cryptantha nevadense				✓	✓		✓	✓	
	Linanthus sp.							✓	✓	
	Lycium cooperi				✓			✓		
	Plagiobothrys sp.							✓		

* Nonnative species

fringe = fringe-toed lizard
astra = astragalus sp. (white flowers)

Duffels 3/15

BLYTHE

INSTRUCTIONS: Please mark the plant species you see, including the day(s) of observation and the phenology(ies) observed. Mark the DOMINANT phenology with an "X", and all other observed phonologies with an "O".

There is additional room for new species at the bottom of each list.

If you observe a species that you are not sure of... please collect it! If you can't collect it because it is not fruiting, etc. or the population is too small, then photograph it! Take it back to the motel and key the darn thing if you can. It is on, or may be on, our rare plant hit list. ☺

Phenology Codes: D = Dead/Dormant, V = Vegetative, B = Blooming, F = Fruiting

Family	Scientific Name	Common Name	Phenology(ies)				Day(s)			
			D	V	B	F	M	T	W	Th
GNETALES										
Ephedraceae – Ephedta Family										
	Ephedra sp.	ephedra								
MONOCOTS										
Agavaceae – Century Plant Family										
	Hesperocallis undulata	desertlily								
Poaceae – Grass Family										
	Aristida adscensionis	sixweeks threeawn								
	Aristida purpurea	purple threeawn								
	Bouteloua barbata var. *barbata*	sixweeks grama								
	Bromus madritensis ssp. *rubens**	red brome, foxtail chess								
	Erioneuron pulchellum (*syn. Dasyochloa pulchella*)	fluff grass								
	Pleuraphis rigida	big galleta grass							✓	
	*Schismus arabicus**	Mediterranean grass							✓	
	*Vulpia bromoides**	brome fescue								
	Vulpia octoflora	sixweeks fescue							✓	
DICOTS										
Asclepiadaceae – Milkweed Family										
	Asclepias subulata	rush milkweed							✓	
	Cynanchum utahense	Utah cynanchum							✓	
	Sarcostemma cynanchoides	climbing milkweed								

Family	Scientific Name	Common Name	Phenology(ies)				Day(s)			
			D	V	B	F	M	T	W	Th
	ssp. *hartwegii*									
	Sarcostemma hirtellum	trailing townula, hairy milkweed								
Asteraceae – Sunflower Family										
	Adenophyllum porophylloides	San Felipe dyssodia								
	Ambrosia dumosa	burroweed , white bursage							✓	
	Atrichoseris platyphylla	parachute plant , gravel ghost							✓	✓
	Bebbia juncea var. *aspera*	sweetbush							✓	
	Calycoseris wrightii	white tackstem							✓	
	Chaenactis carphoclinia	pebble pincushion							✓	✓
	Chaenactis stevioides	desert pincushion							✓	
	Encelia farinosa var. farinosa	brittlebush, incienso							✓	✓
	Encelia farinosa var. phenicodonta	dark-eyed brittlebush							✓	✓
	Encelia frutescens	button brittlebush								
	Geraea canescens	desert-sunflower							✓	
	Hymenoclea salsola	cheesebush								
	Malacothrix glabrata	desert dandelion							✓	✓
	Monoptilon bellioides	Mojave desertstar							✓	✓
	Palafoxia arida var. *arida*	Spanish needle, desert palafox							✓	
	Perityle emoryi	Emory's rockdaisy							✓	
	Pectis papposa	chinchweed							✓	
	Porophyllum gracile	odora stink								✓
	Prenanthella exigua	brightwhite							✓	
	Rafinesquia neomexicana	desert chicory								
	Senecio mohavensis	Mojave ragwort, Mohave Groundsel							✓	
	Stephanomeria exigua	small wire lettuce							✓	
	Stephanomeria pauciflora var. *pauciflora*	wire lettuce							✓	✓
	Trichoptilium incisum	yellowhead, yellowdome							✓	
	Trixis californica var. *californica*	American threefold								
Boraginaceae – Borage Family										
	Amsinckia menziesii var. *menziesii*	rancher's fireweed								✓
	Amsinckia tessellata	fiddleneck							✓	✓

Family	Scientific Name	Common Name	Phenology(ies)				Day(s)			
			D	V	B	F	M	T	W	Th
	Cryptantha angustifolia	narrow leaved cryptantha							✓	✓
	Cryptantha barbigera	bearded cryptantha							✓	✓
	Cryptantha costata	ribbed cryptantha								
	Cryptantha holoptera	winged cyptantha								
	Cryptantha maritima var. maritima	Guadalupe cryptantha							✓	✓
	Cryptantha maritima var. pilosa	Guadalupe cryptantha							✓	✓
	Cyptantha nevadensis var. nevadensis	Nevada catseye							✓	✓
	Cryptantha pterocarya var. cycloptera	wingnut cryptantha							✓	
	~~*Pectocarya penicillata*~~	chuckwalla combseed								
	Pectocarya platycarpa	broadfruit combseed							✓	✓
	Pectocarya recurvata	curvenut combseed, combur								
	Plagiobothrys jonesii	Mojave popcornflower							✓	
	Tiquilia palmeri	Palmer's coldenia								
	Tiquilia plicata	fanleaf crinklemat, plicate coldenia							✓	
	Pectocarya heterocarpha								✓	✓
Brassicaceae – Mustard Family										
	*Brassica tournefortii**	Saharan mustard, Sahara mustard							✓	✓
	Dithyrea californica	spectacle-pod								
	Guillenia lasiophyllum	California mustard							✓	✓
	Lepidium lasiocarpum	pepperweed							✓	✓
	*Sisymbrium irio**	London rocket								
	Tropidocarpum gracile	dobie pod								
	Any previous mention of L. dictyotum should be deleted & ignored									
Cactaceae – Cactus Family										
	Echinocactus polycephalus var. *polycephalus*	cottontop cactus, clustered barrel cactus								
	Ferocactus cylindraceus var. *cylindraceus*	California barrel cactus								

Family	Scientific Name	Common Name	Phenology(ies)				Day(s)			
			D	V	B	F	M	T	W	Th
	Mammillaria tetrancistra	common fishhook cactus							✓	
	Opuntia basilaris	beavertail cactus								
	Opuntia echinocarpa (*Cylindropuntia e.*)	silver cholla, golden cholla							✓	
	Opuntia ramosissima (*Cylindropuntia r.*)	pencil cactus, diamond cholla							✓	
Campanulaceae	*Nemacladus glanduliferus*	threadplant							✓	✓
	var. orientalis									
Chenopodiaceae – Goosefoot Family										
	Atriplex polycarpa	allscale saltbrush								
	Atriplex hymenelytra	desert holly								
	Chenopodium murale	nettleleaf goosefoot							✓	
	Chenopodium sp.	goosefoot								
	*Salsola tragus**	Russian thistle, tumbleweed								
Cucurbitaceae – Gourd Family										
	Brandegea bigelovii	desert starvine							✓	
Euphorbiaceae – Spurge Family										
	Chamaesyce polycarpa	smallseed sandmat							✓	✓
Screwed up Key	*Ditaxis lanceolata*	Narrowleaf ditaxis, narrowleaf silverbush							✓	
	Ditaxis neomexicana	New Mexico ditaxis								
	Euphorbia eriantha	beetle spurge								
	↳ specimen could key to									
	either species → best guess is neomexicana, but WATT D. lanceolata									
Fabaceae – Legume Family										
	Acacia gregii	catclaw								
	Astragalus nuttallianus var. *imperfectus*	turkey peas								
	Astragalus insularis var. *harwoodii*	Harwood's milkvetch							✓	
	Cercidium floridium ssp. *floridium*	blue palo verde							✓	✓
	Dalea mollis	silky dalea, hairy prairie clover							✓	✓

Family	Scientific Name	Common Name	Phenology(ies)				Day(s)			
			D	V	B	F	M	T	W	Th
	Dalea mollissima	hairy dalea, downy dalea								
	~~*Lotus strigosus var. tomentellus*~~	strigose bird's-foot trefoil								
	~~*Lotus wrangelianus*~~	Chilean bird's-foot trefoil								
	Lupinus cf. *arizonicus*	Arizona lupine							✓	
	Marina parryi	Parry's false prairie clover							✓	✓
	Olneya tesota	ironwood							✓	✓
	Prosopis glandulosa	honey mesquite							✓	
	Psorothamnus spinosum	smoke tree								
	Senna armata	spiny senna, desert senna								
	Lotus salsuginosus								✓	✓
Fouquieriaceae – Ocotillo Family										
	Fouquieria splendens ssp. *splendens*	ocotillo								
Geraniaceae – Geranium Family										
	Erodium texanum	Texas storksbill, Desert Heron's Bill							✓	
Hydrophyllaceae – Waterleaf Family										
	Eucrypta micrantha	dainty desert hideseed								✓
	Nama demissum var. *demissum*	purplemat							✓	
	Phacelia crenulata var. *ambigua*	purplestem phacelia							✓	
	Phacelia crenulata var. *minutiflora*	cleftleaf wildheliotrope							✓	
	Phacelia neglecta	alkali phacelia								✓
	Phacelia cf. rotundifol.								✓	✓
	Nama hispidum								✓	✓
	v. spathulatum									
Krameriaceae – Rhatany Family										
	Krameria erecta	Pima rharany, littleleaf ratany								✓
	Krameria grayi	white rhatany							✓	✓

Family	Scientific Name	Common Name	Phenology(ies)				Day(s)			
			D	V	B	F	M	T	W	Th
Lamiaceae – Mint Family										
	Hyptis emoryi	desert-lavender							✓	
Loasaceae – Loasa Family										
	Mentzelia cf. *albicaulis*	small flowered blazing star, white stemmed stickleaf							✓	✓
	Mentzelia involucrata	whitebract blazingstar							✓	
Malvaceae – Mallow Family										
	Eremalche rotundifolia	desert five-spot							✓	
	Hibiscus denudatus	paleface							✓	
	Sphaeralcea ambigua	desert globemallow , apricot mallow								
Martyniaceae – Unicorn-Plant Family										
	Proboscidea althaeifolia	desert unicorn-plant								
Nyctaginaceae – Four O'Clock Family										
	Abronia villosa var. *villosa*	desert sand verbena							✓	
	Allionia incarnata	trailing allionia, windmills							✓	
	Boerhavia	spiderling								
	Mirabilis bigelovii	wishbone bush							✓	
Onagraceae – Evening Primrose Family										
	Camissonia boothii ssp. *desertorum*	desert suncup							✓	✓
	Camissonia brevipes ssp. *brevipes*	golden suncup							✓	✓
	Camissonia cf. *cardiophylla*	heartleaf suncup							✓	
	Camissonia claviformis	browneyes							✓	
	Camissonia refracta	narrowleaf suncup							✓	

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Family	Scientific Name	Common Name	Phenology(ies)				Day(s)			
			D	V	B	F	M	T	W	Th
Papaveraceae – Poppy Family										
	Eschscholzia glyptosperma	desert poppy , desert golden poppy							✓	✓
	Eschscholzia minutiflora	pygmy poppy, Coville's poppy							✓	✓
	E. parishii								✓	
Plantaginaceae – Plantain Family										
	Plantago ovata	desert Indianwheat, woolly plantain							✓	✓
Polemoniaceae – Phlox Family										
	Gilia brecciarum ssp. *brecciarum*	Nevada gilia								
	Gilia latifolia	broadleaf gilia							✓	
	Gilia stellata	star gilia							?	
	Langloisia setosissima ssp. *setosissima*	bristly langloisia							✓	
	Linanthus jonesii	Jones' linanthus							✓	
	Loeseliastrum schottii	Schott's calico							✓	✓
	↳ blue unmarked petals									
	Eriastrum harwoodii –	white, tube shorter; overall white hairier					✓	✓		
	Eriastrum sparsiflorum	– pale blue brown-red stem							✓	
	range says diffusum but	w/ slight puberulents.								
	stamens look inserted equal									
Polygonaceae – Buckwheat Family										
	Chorizanthe brevicornu var. *brevicornu*	brittle spineflower							✓	✓
	Chorizanthe corrugata	wrinkled spineflower							✓	✓
	Chorizanthe rigida	spiny-herb							✓	✓
	Eriogonum inflatum var. *inflatum*	desert trumpet								
	Eriogonum reniforme	kidneyleaf buckwheat								
	Eriogonum thomasii	Thomas Eriogonum							✓	✓
	Eriogonum trichopes	little deserttrumpet								

Family	Scientific Name	Common Name	Phenology(ies)				Day(s)			
			D	V	B	F	M	T	W	Th
Resedaceae – Mignonette Family										
	Oligomeris linifolia	lineleaf whitepuff							✓	
Rhamnaceae – Buckthorn Family										
	Colubrina californica	las animas colubrina								
	Ziziphus cf. *obtusifolia* var. *canescens*	graythorn								
Scrophulariaceae – Figwort Family										
	Antirrhinum filipes	twining snapdragon								
	Mohavea confertiflora	ghost flower								
Solanaceae – Nightshade Family										
	Lycium andersonii	water jacket, Anderson's desert thorn							✓	
	Physalis hederifolia var. *fendleri*	Fendler's groundcherry								
Tamaricaceae – Tamarisk Family										
	Tamarix sp. *	Tamarisk								
Viscaceae – Mistletoe Family										
	Phoradendron californicum	desert mistletoe								
Zygophyllaceae – Caltrop Family										
	Fagonia laevis	California fagonbush							✓	
	Larrea tridentata	creosote bush							✓	
	Kallstroemia parviflora	warty caltrop								
RARE PLANT TARGET LIST										
	Acleisanthes longiflora	Angel trumpets								
	Androstephium breviflorum	small-flowered androstephium								
	Astragalus insularis var. harwoodii	Harwood's milkvetch							✓	
	Astragalus lentiginosus var. coachellae	Coachella Valley milkvetch								
	Ayenia compacta	California ayenia								
	Calliandra eriophylla	Fairyduster								

Family	Scientific Name	Common Name	Phenology(ies)				Day(s)			
			D	V	B	F	M	T	W	Th
	Calochortus striatus	Alkali mariposa-lily								
	Castela emoryi	Crucifixion thorn								
	Chamaesyce abramsiana	Abram's spurge								
	Chamaesyce platysperma	Flat-seeded spurge								
	Colubrina californica	Las Animas colubrine								
	Condalia globosa var. pubescens	bitter snakewood								
	Corypantha alversonii	Foxtail cactus								
	Cryptantha costata	ribbed cryptantha					✓	✓		
	Cryptantha holoptera	winged cryptantha								
	Cynanchum utahense	Utah milkvine							✓	
	Ditaxis claryana	glandular ditaxis								
	Ditaxis serrata var. californica	California ditaxis								
	Echinocactus polycephalus var. polycephalus	cottontop cactus								
	Echinocereus engelmannii	hedgehog cactus								
	Echinocereus triglochidiatus	hedgehog cactus								
	Eriastrum harwoodii	Harwood's wollystar					✓	✓		
	Ferocactus cylindraceus	California barrel cactus								
	Horsfordia alata	pink velvet mallow								
	Hymenoxys odorata	bitter hymenoxys								
	Imperata brevifolia	California satintail								
	Matelea parvifolia	spearleaf								
	Mentzelia puberula	Argus blazing star								
	Physalis lobata	lobed ground cherry								
	Portulaca halimoides	desert portulaca								
	Proboscidea althaeifolia	desert unicorn plant								
	Salvia greatae	Orocopia sage								
	Selaginella eremophila	Desert spikemoss								
	Senna covesii	Coves' cassia								
	Teucrium cubense ssp. depressum	dwarf germander								
	Wislizenia refracta ssp. refracta	Jackass clover								
	Xylorhiza orcuttii	Orcutt's Woody-aster								
OTHER SPECIES NEW TO LIST										

Family	Scientific Name	Common Name	Phenology(ies)				Day(s)			
			D	V	B	F	M	T	W	Th

Family	Scientific Name	Common Name	Phenology(ies)				Day(s)			
			D	V	B	F	M	T	W	Th

* Nonnative species

Tuesday J.D. JEANNETTE DUFFELS 3/16/2010

~~[illegible]~~

~~Lupinus sp.~~

Camissonia claviformis X brevipes blooming

Cammissonia boothii dead

~~Mohavia sp.~~

Wed

~~mistletoe~~

~~Cucurbita~~ brand ~~dead~~

turtleback Psathroides ramossisima veg

Plagiobothrys? jonessii blooming

Thurs

Oenothera primaveris ssp. bufonious blooming

Nama sp. blooming

dodder sp.

Cryptantha micrantha blooming

J. Duffels 3/25/10
SM9

3728800 UTM turned around at 11 S 0708964

BLYTHE

INSTRUCTIONS: Please mark the plant species you see, including the day(s) of observation and the phenology(ies) observed. Mark the DOMINANT phenology with an "X", and all other observed phonologies with an "O".

There is additional room for new species at the bottom of each list.

If you observe a species that you are not sure of... please collect it! If you can't collect it because it is not fruiting, etc. or the population is too small, then photograph it! Take it back to the motel and key the darn thing if you can. It is on, or may be on, our rare plant hit list. ☺

Phenology Codes: D = Dead/Dormant, V = Vegetative, B = Blooming, F = Fruiting

Family	Scientific Name	Common Name	Phenology(ies)				Day(s)			
			D	V	B	F	M	T	W	Th
GNETALES										
Ephedraceae – Ephedta Family										
	Ephedra sp.	ephedra			✓					✓
MONOCOTS										
Agavaceae – Century Plant Family										
	Hesperocallis undulata	desertlily			✓					✓
Poaceae – Grass Family										
	Aristida adscensionis	sixweeks threeawn								
	Aristida purpurea	purple threeawn								
	Bouteloua barbata var. *barbata*	sixweeks grama								
	Bromus madritensis ssp. *rubens**	red brome, foxtail chess								
	Erioneuron pulchellum (*syn. Dasyochloa pulchella*)	fluff grass								
	Pleuraphis rigida	big galleta grass			✓					✓
	*Schismus arabicus**	Mediterranean grass			✓					✓
	*Vulpia bromoides**	brome fescue								
	Vulpia octoflora	sixweeks fescue								
DICOTS										
Asclepiadaceae – Milkweed Family										
	Asclepias subulata	rush milkweed								
	Cynanchum utahense	Utah cynanchum								
	Sarcostemma cynanchoides	climbing milkweed								

Family	Scientific Name	Common Name	Phenology(ies)				Day(s)			
			D	V	B	F	M	T	W	Th
	ssp. *hartwegii*									
	Sarcostemma hirtellum	trailing townula, hairy milkweed								
Asteraceae – Sunflower Family										
	Adenophyllum porophylloides	San Felipe dyssodia								
	Ambrosia dumosa	burroweed , white bursage			✓					✓
	Atrichoseris platyphylla	parachute plant , gravel ghost								
	Bebbia juncea var. *aspera*	sweetbush								
	Calycoseris wrightii	white tackstem		✓						✓
	Chaenactis carphoclinia	pebble pincushion								
	Chaenactis stevioides	desert pincushion		✓	✓					✓
	Encelia farinosa var. farinosa	brittlebush, incienso		✓	✓					✓
	Encelia farinosa var. phenicodonta	dark-eyed brittlebush								
	Encelia frutescens	button brittlebush								
	Geraea canescens	desert-sunflower		✓	✓					✓
	Hymenoclea salsola	cheesebush								
	Malacothrix glabrata	desert dandelion		✓						✓
	Monoptilon bellioides	Mojave desertstar								
	Palafoxia arida var. *arida*	Spanish needle, desert palafox								
	Perityle emoryi	Emory's rockdaisy								
	Pectis papposa	chinchweed								
	Porophyllum gracile	odora								
	Prenanthella exigua	brightwhite								
	Rafinesquia neomexicana	desert chicory								✓
	Senecio mohavensis	Mojave ragwort, Mohave Groundsel								
	Stephanomeria exigua	small wire lettuce								
	Stephanomeria pauciflora var. *pauciflora*	wire lettuce								
	Trichoptilium incisum	yellowhead, yellowdome								
	Trixis californica var. *californica*	American threefold								
Boraginaceae – Borage Family										
	Amsinckia menziesii var. *menziesii*	rancher's fireweed			✓					✓
	Amsinckia tessellata	fiddleneck								

Family	Scientific Name	Common Name	Phenology(ies)				Day(s)			
			D	V	B	F	M	T	W	Th
	Cryptantha angustifolia	narrow leaved cryptantha			✓					✓
	Cryptantha barbigera	bearded cryptantha			✓					✓
	Cryptantha costata	ribbed cryptantha								
	Cryptantha holoptera	winged cyptantha								
	Cryptantha maritima var. maritima	Guadalupe cryptantha			✓					✓
	Cryptantha maritima var. pilosa	Guadalupe cryptantha								
	Cyptantha nevadensis var. nevadensis	Nevada catseye			✓					✓
	Cryptantha pterocarya var. cycloptera	wingnut cryptantha								
	Pectocarya penicillata	chuckwalla combseed								
	Pectocarya platycarpa	broadfruit combseed			✓	✓				✓
	Pectocarya recurvata	curvenut combseed, combur								
	Plagiobothrys jonesii	Mojave popcornflower								
	Tiquilia palmeri	Palmer's coldenia								
	Tiquilia plicata	fanleaf crinklemat, plicate coldenia								
Brassicaceae – Mustard Family										
	*Brassica tournefortii**	Saharan mustard, Sahara mustard		✓	✓					✓
	Dithyrea californica	spectacle-pod								
	Guillenia lasiophyllum	California mustard								
	Lepidium lasiocarpum	pepperweed			✓					✓
	*Sisymbrium irio**	London rocket		✓						✓
	Tropidocarpum gracile	dobie pod								
Cactaceae – Cactus Family										
	Echinocactus polycephalus var. *polycephalus*	cottontop cactus, clustered barrel cactus								
	Ferocactus cylindraceus var. *cylindraceus*	California barrel cactus								

Family	Scientific Name	Common Name	Phenology(ies)				Day(s)			
			D	V	B	F	M	T	W	Th
	Mammillaria tetrancistra	common fishhook cactus								
	Opuntia basilaris	beavertail cactus								
	Opuntia echinocarpa (*Cylindropuntia e.*)	silver cholla, golden cholla			✓					✓
	Opuntia ramosissima (*Cylindropuntia r.*)	pencil cactus, diamond cholla								
	Nemacladus	threadplant								
Chenopodiaceae – Goosefoot Family										
	Atriplex polycarpa	allscale saltbrush								
	Atriplex hymenelytra	desert holly								
	Chenopodium murale	nettleleaf goosefoot								
	Chenopodium sp.	goosefoot								
	*Salsola tragus**	Russian thistle, tumbleweed								
Cucurbitaceae – Gourd Family										
	Brandegea bigelovii	desert starvine								
Euphorbiaceae – Spurge Family										
	Chamaesyce polycarpa	smallseed sandmat		✓						✓
	Ditaxis lanceolata	Narrowleaf ditaxis, narrowleaf silverbush								
	Ditaxis neomexicana	New Mexico ditaxis								
	Euphorbia eriantha	beetle spurge								
Fabaceae – Legume Family										
	Acacia gregii	catclaw								
	Astragalus nuttallianus var. *imperfectus*	turkey peas								
	Astragalus insularis var. *harwoodii*	Harwood's milkvetch		✓	✓	✓				✓
	Cercidium floridium ssp. *floridium*	blue palo verde								
	Dalea mollis	silky dalea, hairy prairie clover								

Family	Scientific Name	Common Name	Phenology(ies)				Day(s)			
			D	V	B	F	M	T	W	Th
	Dalea mollissima	hairy dalea, downy dalea								
	Lotus strigosus var. tomentellus	strigose bird's-foot trefoil			✓					✓
	Lotus wrangelianus	Chilean bird's-foot trefoil								
	Lupinus cf. *arizonicus*	Arizona lupine								
	Marina parryi	Parry's false prairie clover								
	Olneya tesota	ironwood								
	Prosopis glandulosa	honey mesquite								
	Psorothamnus spinosum	smoke tree								
	Senna armata	spiny senna, desert senna								
Fouquieriaceae – Ocotillo Family										
	Fouquieria splendens ssp. *splendens*	ocotillo								
Geraniaceae – Geranium Family										
	Erodium texanum	Texas storksbill, Desert Heron's Bill		✓						✓
Hydrophyllaceae – Waterleaf Family										
	Eucrypta micrantha	dainty desert hideseed								
	Nama demissum var. *demissum*	purplemat			✓					✓
	Phacelia crenulata var. *ambigua*	purplestem phacelia								
	Phacelia crenulata var. *minutiflora*	cleftleaf wildheliotrope								
	Phacelia neglecta	alkali phacelia								
Krameriaceae – Rhatany Family										
	Krameria erecta	Pima rharany, littleleaf ratany								
	Krameria grayi	white rhatany		✓						✓

Family	Scientific Name	Common Name	Phenology(ies)				Day(s)			
			D	V	B	F	M	T	W	Th
Lamiaceae – Mint Family										
	Hyptis emoryi	desert-lavender								
Loasaceae – Loasa Family										
	Mentzelia cf. *albicaulis*	small flowered blazing star, white stemmed stickleaf								
	Mentzelia involucrata	whitebract blazingstar		✓						✓
Malvaceae – Mallow Family										
	Eremalche rotundifolia	desert five-spot		✓						✓
	Hibiscus denudatus	paleface								
	Sphaeralcea ambigua	desert globemallow , apricot mallow								
Martyniaceae – Unicorn-Plant Family										
	Proboscidea althaeifolia	desert unicorn-plant								
Nyctaginaceae – Four O'Clock Family										
	Abronia villosa var. *villosa*	desert sand verbena			✓					✓
	Allionia incarnata	trailing allionia, windmills								
	Boerhavia	spiderling								
	Mirabilis bigelovii	wishbone bush								
Onagraceae – Evening Primrose Family										
	Camissonia boothii ssp. *desertorum*	desert suncup								
	Camissonia brevipes ssp. *brevipes*	golden suncup								
	Camissonia cf. *cardiophylla*	heartleaf suncup								
	Camissonia claviformis	browneyes								
	Camissonia refracta	narrowleaf suncup								
	Oenothera deltoides				✓					✓

Family	Scientific Name	Common Name	Phenology(ies)				Day(s)			
			D	V	B	F	M	T	W	Th
Papaveraceae – Poppy Family										
	Eschscholzia glyptosperma	desert poppy , desert golden poppy								
	Eschscholzia minutiflora	pygmy poppy, Coville's poppy			✓					✓
Plantaginaceae – Plantain Family										
	Plantago ovata	desert Indianwheat, woolly plantain		✓	✓					✓
Polemoniaceae – Phlox Family										
	Gilia brecciarum ssp. *brecciarum*	Nevada gilia								
	Gilia latifolia	broadleaf gilia								
	Gilia stellata	star gilia								
	Langloisia setosissima ssp. *setosissima*	bristly langloisia								
	Linanthus jonesii	Jones' linanthus		✓						✓
	Loeseliastrum schottii	Schott's calico		✓						✓
Polygonaceae – Buckwheat Family										
	Chorizanthe brevicornu var. *brevicornu*	brittle spineflower		✓						✓
	Chorizanthe corrugata	wrinkled spineflower								
	Chorizanthe rigida	spiny-herb		✓						✓
	Eriogonum inflatum var. *inflatum*	desert trumpet								
	Eriogonum reniforme	kidneyleaf buckwheat								
	Eriogonum thomasii	Thomas Eriogonum			✓					✓
	Eriogonum trichopes	little deserttrumpet								

Family	Scientific Name	Common Name	Phenology(ies)				Day(s)			
			D	V	B	F	M	T	W	Th
Resedaceae – Mignonette Family										
	Oligomeris linifolia	lineleaf whitepuff		✓						✓
Rhamnaceae – Buckthorn Family										
	Colubrina californica	las animas colubrina								
	Ziziphus cf. *obtusifolia* var. *canescens*	graythorn								
Scrophulariaceae – Figwort Family										
	Antirrhinum filipes	twining snapdragon								
	Mohavea confertiflora	ghost flower								
Solanaceae – Nightshade Family										
	Lycium andersonii	water jacket, Anderson's desert thorn								
	Physalis hederifolia var. *fendleri*	Fendler's groundcherry								
Tamaricaceae – Tamarisk Family										
	Tamarix sp. *	Tamarisk								
Viscaceae – Mistletoe Family										
	Phoradendron californicum	desert mistletoe								
Zygophyllaceae – Caltrop Family										
	Fagonia laevis	California fagonbush								
	Larrea tridentata	creosote bush			✓					✓
	Kallstroemia parviflora	warty caltrop								
RARE PLANT TARGET LIST										
	Acleisanthes longiflora	Angel trumpets								
	Androstephium breviflorum	small-flowered androstephium								
	Astragalus insularis var. harwoodii	Harwood's milkvetch		✓	✓	✓				✓
	Astragalus lentiginosus var. coachellae	Coachella Valley milkvetch								
	Ayenia compacta	California ayenia								
	Calliandra eriophylla	Fairyduster								

Family	Scientific Name	Common Name	Phenology(ies)				Day(s)			
			D	V	B	F	M	T	W	Th
	Calochortus striatus	Alkali mariposa-lily								
	Castela emoryi	Crucifixion thorn								
	Chamaesyce abramsiana	Abram's spurge								
	Chamaesyce platysperma	Flat-seeded spurge								
	Colubrina californica	Las Animas colubrine								
	Condalia globosa var. pubescens	bitter snakewood								
	Corypantha alversonii	Foxtail cactus								
	Cryptantha costata	ribbed cryptantha								
	Cryptantha holoptera	winged cryptantha								
	Cynanchum utahense	Utah milkvine								
	Ditaxis claryana	glandular ditaxis								
	Ditaxis serrata var. californica	California ditaxis								
	Echinocactus polycephalus var. polycephalus	cottontop cactus								
	Echinocereus engelmannii	hedgehog cactus								
	Echinocereus triglochidiatus	hedgehog cactus								
	Eriastrum harwoodii	Harwood's wollystar								
	Ferocactus cylindraceus	California barrel cactus								
	Horsfordia alata	pink velvet mallow								
	Hymenoxys odorata	bitter hymenoxys								
	Imperata brevifolia	California satintail								
	Matelea parvifolia	spearleaf								
	Mentzelia puberula	Argus blazing star								
	Physalis lobata	lobed ground cherry								
	Portulaca halimoides	desert portulaca								
	Proboscidea althaeifolia	desert unicorn plant								
	Salvia greatae	Orocopia sage								
	Selaginella eremophila	Desert spikemoss								
	Senna covesii	Coves' cassia								
	Teucrium cubense ssp. depressum	dwarf germander								
	Wislizenia refracta ssp. refracta	Jackass clover								
	Xylorhiza orcuttii	Orcutt's Woody-aster								
OTHER SPECIES NEW TO LIST										
		Ocotillo		✓						✓

Family	Scientific Name	Common Name	Phenology(ies)				Day(s)			
			D	V	B	F	M	T	W	Th

Family	Scientific Name	Common Name	Phenology(ies)				Day(s)			
			D	V	B	F	M	T	W	Th

* Nonnative species

Asthar 1 Plant, etc.

fine sandy wash w/ creosote, galleta
adjacent to desert pavement

J. Duffels
4/14, 4/15
Garmin Sm8

BLYTHE

INSTRUCTIONS: Please mark the plant species you see, including the day(s) of observation and the phenology(ies) observed. Mark the DOMINANT phenology with an "X", and all other observed phonologies with an "O".

There is additional room for new species at the bottom of each list.

If you observe a species that you are not sure of… please collect it! If you can't collect it because it is not fruiting, etc. or the population is too small, then photograph it! Take it back to the motel and key the darn thing if you can. It is on, or may be on, our rare plant hit list. ☺

Phenology Codes: D = Dead/Dormant, V = Vegetative, B = Blooming, F = Fruiting

Family	Scientific Name	Common Name	Phenology(ies)				Day(s)			
			D	V	B	F	M	T	W	Th
GNETALES										
Ephedraceae – Ephedta Family										
	Ephedra sp.	ephedra								
MONOCOTS										
Agavaceae – Century Plant Family										
	Hesperocallis undulata	desertlily			✓	✓			✓	✓
Poaceae – Grass Family										
	Aristida adscensionis	sixweeks threeawn	✓						✓	
	Aristida purpurea	purple threeawn								
	Bouteloua barbata var. *barbata*	sixweeks grama								
	Bromus madritensis ssp. *rubens**	red brome, foxtail chess								
	Erioneuron pulchellum (*syn. Dasyochloa pulchella*)	fluff grass								
	Pleuraphis rigida	big galleta grass		✓	✓				✓	✓
	*Schismus arabicus**	Mediterranean grass			✓				✓	✓
	*Vulpia bromoides**	brome fescue								
	Vulpia octoflora	sixweeks fescue			✓					✓
	Cynodon dactylon				✓					✓
	Hordeum sp.				✓					✓
					✓					✓
DICOTS										
Asclepiadaceae – Milkweed Family										
	Asclepias subulata	rush milkweed		✓						✓
	Cynanchum utahense	Utah cynanchum								
	Sarcostemma cynanchoides	climbing milkweed								

Family	Scientific Name	Common Name	Phenology(ies)				Day(s)			
			D	V	B	F	M	T	W	Th
	ssp. *hartwegii*									
	Sarcostemma hirtellum	trailing townula, hairy milkweed								
Asteraceae – Sunflower Family										
	Adenophyllum porophylloides	San Felipe dyssodia								
	Ambrosia dumosa	burroweed , white bursage			✓				✓	✓
	Atrichoseris platyphylla	parachute plant , gravel ghost			✓					✓
	Bebbia juncea var. *aspera*	sweetbush								
	Calycoseris wrightii	white tackstem			✓					✓
	Chaenactis carphoclinia	pebble pincushion								
	Chaenactis stevioides	desert pincushion	✓		✓				✓	✓
	Encelia farinosa var. farinosa	brittlebush, incienso			✓					✓
	Encelia farinosa var. phenicodonta	dark-eyed brittlebush			✓					✓
	Encelia frutescens	button brittlebush								
	Geraea canescens	desert-sunflower			✓				✓	✓
	Hymenoclea salsola	cheesebush		✓						✓
	Malacothrix glabrata	desert dandelion			✓				✓	✓
	Monoptilon bellioides	Mojave desertstar			✓				✓	✓
	Palafoxia arida var. *arida*	Spanish needle, desert palafox			✓				✓	✓
	Perityle emoryi	Emory's rockdaisy			✓					✓
	Pectis papposa	chinchweed								
	Porophyllum gracile	odora								
	Prenanthella exigua	brightwhite								
	Rafinesquia neomexicana	desert chicory			✓				✓	✓
	Senecio mohavensis	Mojave ragwort, Mohave Groundsel								
	Stephanomeria exigua	small wire lettuce								
	Stephanomeria pauciflora var. *pauciflora*	wire lettuce			✓				✓	
	Trichoptilium incisum	yellowhead, yellowdome								
	Trixis californica var. *californica*	American threefold								
	Baileya pauciradia				✓				✓	
	Sarcomus clavicens				✓				✓	
	Stylocline gnaphalioides?				✓					✓
Boraginaceae – Borage Family										
	Amsinckia menziesii var. *menziesii*	rancher's fireweed								
	Amsinckia tessellata	fiddleneck								

Family	Scientific Name	Common Name	Phenology(ies)				Day(s)			
			D	V	B	F	M	T	W	Th
	Cryptantha angustifolia	narrow leaved cryptantha			✓	✓			✓	✓
	Cryptantha barbigera	bearded cryptantha			✓					✓
	Cryptantha costata	ribbed cryptantha				✓			✓	
	Cryptantha holoptera	winged cyptantha								
	Cryptantha maritima var. maritima	Guadalupe cryptantha				✓			✓	✓
	Cryptantha maritima var. pilosa	Guadalupe cryptantha								
	Cyptantha nevadensis var. nevadensis	Nevada catseye			✓					✓
	Cryptantha pterocarya var. cycloptera	wingnut cryptantha								
	Pectocarya penicillata	chuckwalla combseed								
	Pectocarya platycarpa	broadfruit combseed	✓			✓			✓	✓
	Pectocarya recurvata	curvenut combseed, combur								
	Plagiobothrys jonesii	Mojave popcornflower								
	Tiquilia palmeri	Palmer's coldenia								
	Tiquilia plicata	fanleaf crinklemat, plicate coldenia			✓				✓	
	Pectocarya heterocarpa					✓			✓	
Brassicaceae – Mustard Family										
	*Brassica tournefortii**	Saharan mustard, Sahara mustard			✓	✓			✓	✓
	Dithyrea californica	spectacle-pod				✓			✓	
	Guillenia lasiophyllum	California mustard								
	Lepidium lasiocarpum	pepperweed				✓			✓	✓
	*Sisymbrium irio**	London rocket								
	Tropidocarpum gracile	dobie pod								
Cactaceae – Cactus Family										
	Echinocactus polycephalus var. *polycephalus*	cottontop cactus, clustered barrel cactus								
	Ferocactus cylindraceus var. *cylindraceus*	California barrel cactus								

Family	Scientific Name	Common Name	Phenology(ies)				Day(s)			
			D	V	B	F	M	T	W	Th
	Mammillaria tetrancistra	common fishhook cactus								
	Opuntia basilaris	beavertail cactus								
	Opuntia echinocarpa (*Cylindropuntia e.*)	silver cholla, golden cholla								
	Opuntia ramosissima (*Cylindropuntia r.*)	pencil cactus, diamond cholla			✓					✓
	Nemacladus	threadplant								
Chenopodiaceae – Goosefoot Family										
	Atriplex polycarpa	allscale saltbrush								
	Atriplex hymenelytra	desert holly								
	Chenopodium murale	nettleleaf goosefoot								
	Chenopodium sp.	goosefoot								
	*Salsola tragus**	Russian thistle, tumbleweed								
Cucurbitaceae – Gourd Family										
	Brandegea bigelovii	desert starvine								
Euphorbiaceae – Spurge Family										
	Chamaesyce polycarpa	smallseed sandmat		✓					✓	✓
	Ditaxis lanceolata	Narrowleaf ditaxis, narrowleaf silverbush								
	Ditaxis neomexicana	New Mexico ditaxis			✓					✓
	Euphorbia eriantha	beetle spurge								
	Stillingia spinulosa				✓				✓	
Fabaceae – Legume Family										
	Acacia gregii	catclaw			✓					✓
	Astragalus nuttallianus var. *imperfectus*	turkey peas								
	Astragalus insularis var. *harwoodii*	Harwood's milkvetch		✓		✓			✓	✓
	Cercidium floridium ssp. *floridium*	blue palo verde		✓	✓					✓
	Dalea mollis	silky dalea, hairy prairie clover		✓	✓				✓	

Family	Scientific Name	Common Name	Phenology(ies)				Day(s)			
			D	V	B	F	M	T	W	Th
	Dalea mollissima	hairy dalea, downy dalea								
	Lotus strigosus var. tomentellus	strigose bird's-foot trefoil			✓	✓			✓	✓
	Lotus wrangelianus	Chilean bird's-foot trefoil								
	Lupinus cf. *arizonicus*	Arizona lupine								
	Marina parryi	Parry's false prairie clover		✓	✓					✓
	Olneya tesota	ironwood		✓						✓
	Prosopis glandulosa	honey mesquite								
	Psorothamnus spinosum	smoke tree								
	Senna armata	spiny senna, desert senna								
	Astragalus aridus			✓		✓			✓	
	Melilotus indica				✓					✓
Fouquieriaceae – Ocotillo Family										
	Fouquieria splendens ssp. splendens	ocotillo								
Geraniaceae – Geranium Family										
	Erodium texanum	Texas storksbill, Desert Heron's Bill				✓			✓	✓
Hydrophyllaceae – Waterleaf Family										
	Eucrypta micrantha	dainty desert hideseed								
	Nama demissum var. demissum	purplemat								
	Phacelia crenulata var. ambigua	purplestem phacelia								
	Phacelia crenulata var. minutiflora	cleftleaf wildheliotrope			✓					✓
	Phacelia neglecta	alkali phacelia								
	Nama h.				✓					✓
Krameriaceae – Rhatany Family										
	Krameria erecta	Pima rharany, littleleaf ratany								
	Krameria grayi	white rhatany			✓					✓

Family	Scientific Name	Common Name	Phenology(ies)				Day(s)			
			D	V	B	F	M	T	W	Th
Lamiaceae – Mint Family										
	Hyptis emoryi	desert-lavender								
	rosemary			✓						✓
Loasaceae – Loasa Family										
	Mentzelia cf. *albicaulis*	small flowered blazing star, white stemmed stickleaf				✓				✓
	Mentzelia involucrata	whitebract blazingstar				✓				✓
Malvaceae – Mallow Family										
	Eremalche rotundifolia	desert five-spot								
	Hibiscus denudatus	paleface								
	Sphaeralcea ambigua	desert globemallow , apricot mallow								
Martyniaceae – Unicorn-Plant Family										
	Proboscidea althaeifolia	desert unicorn-plant								
Nyctaginaceae – Four O'Clock Family										
	Abronia villosa var. *villosa*	desert sand verbena			✓				✓	✓
	Allionia incarnata	trailing allionia, windmills								
	Boerhavia	spiderling								
	Mirabilis bigelovii	wishbone bush			✓					✓
Onagraceae – Evening Primrose Family										
	Camissonia boothii ssp. *desertorum*	desert suncup		✓						✓
	Camissonia brevipes ssp. *brevipes*	golden suncup								
	Camissonia cf. *cardiophylla*	heartleaf suncup								
	Camissonia claviformis	browneyes			✓	✓			✓	✓
	Camissonia refracta	narrowleaf suncup								
	Oenothera deltoides				✓				✓	
	Camissonia californica				✓				✓	✓
	Oenothera primaveris				✓					✓

Family	Scientific Name	Common Name	Phenology(ies)				Day(s)			
			D	V	B	F	M	T	W	Th
Papaveraceae – Poppy Family										
	Eschscholzia glyptosperma	desert poppy , desert golden poppy								
	Eschscholzia minutiflora	pygmy poppy, Coville's poppy			✓					✓
Plantaginaceae – Plantain Family										
	Plantago ovata	desert Indianwheat, woolly plantain			✓				✓	✓
Polemoniaceae – Phlox Family										
	Gilia brecciarum ssp. *brecciarum*	Nevada gilia								
	Gilia latifolia	broadleaf gilia								
	Gilia stellata	star gilia		✓					✓	
	Langloisia setosissima ssp. *setosissima*	bristly langloisia			✓					✓
	Linanthus jonesii	Jones' linanthus								
	Loeseliastrum schottii	Schott's calico			✓				✓	
Polygonaceae – Buckwheat Family										
	Chorizanthe brevicornu var. *brevicornu*	brittle spineflower			✓				✓	✓
	Chorizanthe corrugata	wrinkled spineflower			✓				✓	
	Chorizanthe rigida	spiny-herb			✓				✓	✓
	Eriogonum inflatum var. *inflatum*	desert trumpet								
	Eriogonum reniforme	kidneyleaf buckwheat			✓					✓
	Eriogonum thomasii	Thomas Eriogonum			✓				✓	
	Eriogonum trichopes	little deserttrumpet			✓				✓	✓

Family	Scientific Name	Common Name	Phenology(ies)				Day(s)			
			D	V	B	F	M	T	W	Th
Resedaceae – Mignonette Family										
	Oligomeris linifolia	lineleaf whitepuff			✓				✓	
Rhamnaceae – Buckthorn Family										
	Colubrina californica	las animas colubrina								
	Ziziphus cf. *obtusifolia* var. *canescens*	graythorn								
Scrophulariaceae – Figwort Family										
	Antirrhinum filipes	twining snapdragon								
	Mohavea confertiflora	ghost flower								
Solanaceae – Nightshade Family										
	Lycium andersonii	water jacket, Anderson's desert thorn								
	Physalis hederifolia var. *fendleri*	Fendler's groundcherry								
Tamaricaceae – Tamarisk Family										
	Tamarix sp. *	Tamarisk			✓	✓				✓
Viscaceae – Mistletoe Family										
	Phoradendron californicum	desert mistletoe								
Zygophyllaceae – Caltrop Family										
	Fagonia laevis	California fagonbush								
	Larrea tridentata	creosote bush			✓				✓	✓
	Kallstroemia parviflora	warty caltrop								
RARE PLANT TARGET LIST										
	Acleisanthes longiflora	Angel trumpets								
	Androstephium breviflorum	small-flowered androstephium								
	Astragalus insularis var. harwoodii	Harwood's milkvetch								
	Astragalus lentiginosus var. coachellae	Coachella Valley milkvetch								
	Ayenia compacta	California ayenia								
	Calliandra eriophylla	Fairyduster								

Family	Scientific Name	Common Name	Phenology(ies)				Day(s)			
			D	V	B	F	M	T	W	Th
	Calochortus striatus	Alkali mariposa-lily								
	Castela emoryi	Crucifixion thorn								
	Chamaesyce abramsiana	Abram's spurge								
	Chamaesyce platysperma	Flat-seeded spurge								
	Colubrina californica	Las Animas colubrine								
	Condalia globosa var. pubescens	bitter snakewood								
	Corypantha alversonii	Foxtail cactus								
	Cryptantha costata	ribbed cryptantha								
	Cryptantha holoptera	winged cryptantha								
	Cynanchum utahense	Utah milkvine								
	Ditaxis claryana	glandular ditaxis								
	Ditaxis serrata var. californica	California ditaxis								
	Echinocactus polycephalus var. polycephalus	cottontop cactus								
	Echinocereus engelmannii	hedgehog cactus								
	Echinocereus triglochidiatus	hedgehog cactus								
	Eriastrum harwoodii	Harwood's wollystar			✓				✓	
	Ferocactus cylindraceus	California barrel cactus								
	Horsfordia alata	pink velvet mallow								
	Hymenoxys odorata	bitter hymenoxys								
	Imperata brevifolia	California satintail								
	Matelea parvifolia	spearleaf								
	Mentzelia puberula	Argus blazing star								
	Physalis lobata	lobed ground cherry								
	Portulaca halimoides	desert portulaca								
	Proboscidea althaeifolia	desert unicorn plant								
	Salvia greatae	Orocopia sage								
	Selaginella eremophila	Desert spikemoss								
	Senna covesii	Coves' cassia								
	Teucrium cubense ssp. depressum	dwarf germander								
	Wislizenia refracta ssp. refracta	Jackass clover								
	Xylorhiza orcuttii	Orcutt's Woody-aster								
OTHER SPECIES NEW TO LIST										
	Acryonickia cooperi				✓				✓	✓
	Tamarisk ram				✓					✓
	Washingtonia			✓						✓
	Heliotropium convulvulaceae				✓				✓	

Family	Scientific Name	Common Name	Phenology(ies)				Day(s)			
			D	V	B	F	M	T	W	Th

Family	Scientific Name	Common Name	Phenology(ies)				Day(s)			
			D	V	B	F	M	T	W	Th

* Nonnative species

BLYTHE SOLAR POWER PROJECT

SPRING 2010 BOTANICAL SURVEYS

SCAN DETAILS

Surveyor	Harper, Kyle
Scanned By	Harper, Kyle
Scan Date	05.17.2010

BLYTHE

Family	Scientific Name	Common Name	Phenology(ies)				Day(s)			
			D	V	B	F	M	T	W	Th
	GNETALES									
Ephedraceae – Ephedta Family										
	Ephedra sp.	ephedra								
	MONOCOTS									
Poaceae – Grass Family										
	Aristida adscensionis	sixweeks threeawn								
	Aristida purpurea	purple threeawn								
	Bouteloua barbata var. *barbata*	sixweeks grama								
	Bromus madritensis ssp. *rubens**	red brome, foxtail chess								
	Erioneuron pulchellum (*syn. Dasyochloa pulchella*)	fluff grass								
	Pleuraphis rigida	big galleta grass	X	X	X		X	X	X	
	Schismus sp.*	Mediterranean grass		X	X				X	X
	*Vulpia bromoides**	brome fescue								
	Vulpia octoflora	sixweeks fescue								
	DICOTS									
Asclepiadaceae – Milkweed Family										
	Asclepias subulata	rush milkweed								
	Cynanchum utahense	Utah cynanchum			X					X
	Sarcostemma cynanchoides ssp. *hartwegii*	climbing milkweed			X			X	X	X
	Sarcostemma hirtellum	trailing townula, hairy milkweed			X			X		
Asteraceae – Sunflower Family										
	Adenophyllum porophylloides	San Felipe dyssodia								
	Ambrosia dumosa	burroweed , white bursage	X	X			X	X	X	
	Atrichoseris platyphylla	parachute plant , gravel ghost		X				X	X	
	Bebbia juncea var. *aspera*	sweetbush		X				X	X	
	Calycoseris wrightii	white tackstem		X			X	X	X	
	Chaenactis carphoclinia	pebble pincushion			X		X	X		
	Chaenactis stevioides	desert pincushion			X		X	X	X	X
	Encelia farinosa	brittlebush, incienso			X		X	X	X	X
	Encelia frutescens	button brittlebush			X					X
	Geraea canescens	desert-sunflower		X	X		X	X	X	X
	Hymenoclea salsola	cheesebush			X					X
	Malacothrix glabrata	desert dandelion			X			X	X	
	Monoptilon bellioides	Mojave desertstar		X			X	X	X	
	Palafoxia arida var. *arida*	Spanish needle, desert palafox		X	X		X	X	X	X
	Perityle emoryi	Emory's rockdaisy		X				X		
	Pectis papposa	chinchweed								
	Porophyllum gracile	odora								
	Prenanthella exigua	brightwhite								
	Rafinesquia neomexicana	desert chicory			X		X	X	X	
	Senecio mohavensis	Mojave ragwort, Mohave Groundsel								

KYLE HARPER 3/15-3/18 2010

Family	Scientific Name	Common Name	Phenology(ies)				Day(s)			
			D	V	B	F	M	T	W	Th
	Stephanomeria pauciflora var. *pauciflora*	wire lettuce			X			X		
	Trichoptilium incisum	yellowhead, yellowdome								
	Trixis californica var. *californica*	American threefold								
Boraginaceae – Borage Family										
	Amsinckia menziesii var. *menziesii*	rancher's fireweed			X				X	X
	Cryptantha angustifolia	narrow leaved cryptantha			X	X	X	X	X	X
	Cryptantha barbigera	bearded cryptantha				X		X	X	X
	Cryptantha costata	ribbed cryptantha			X	X	X			
	Cryptantha maritima	Guadalupe cryptantha			X	X	X	X	X	X
	Cryptantha pterocarya	wingnut cryptantha			X	X	X	X		
	Pectocarya penicillata	chuckwalla combseed								
	Pectocarya platycarpa	broadfruit combseed			X	X	X	X	X	
	Tiquilia plicata	fanleaf crinklemat, plicate coldenia		X			X			
Brassicaceae – Mustard Family										
	*Brassica tournefortii**	Saharan mustard, Sahara mustard	X	X	X	X	X	X	X	X
	Dithyrea californica	spectacle-pod			X	X	X			
	Guillenia lasiophyllum	California mustard								
	Lepidium ~~sp.~~ *dictyorum*	pepperweed				X	X	X	X	
	Tropidocarpum gracile	dobie pod								
Cactaceae – Cactus Family										
	Echinocactus polycephalus var. *polycephalus*	cottontop cactus, clustered barrel cactus								
	Ferocactus cylindraceus var. *cylindraceus*	California barrel cactus								
	Mammillaria tetrancistra	common fishhook cactus		X				X		
	Opuntia basilaris	beavertail cactus								
	Opuntia echinocarpa (*Cylindropuntia e.*)	silver cholla, golden cholla		X	X		X	X		
	Opuntia ramosissima (*Cylindropuntia r.*)	pencil cactus, diamond cholla								
Chenopodiaceae – Goosefoot Family										
	Atriplex polycarpa	allscale saltbrush								
	Atriplex hymenelytra	desert holly								
	Chenopodium murale	nettleleaf goosefoot								
	Chenopodium sp.	goosefoot								
	*Salsola tragus**	Russian thistle, tumbleweed		X			X			
Cucurbitaceae – Gourd Family										
	Brandegea bigelovii	desert starvine			X				X	
Euphorbiaceae – Spurge Family										
	Chamaesyce polycarpa	smallseed sandmat		X	X		X	X	X	
	Ditaxis lanceolata	Narrowleaf ditaxis, narrowleaf silverbush			X				X	
	Ditaxis neomexicana	New Mexico ditaxis								

Family	Scientific Name	Common Name	Phenology(ies)				Day(s)			
			D	V	B	F	M	T	W	Th
	Euphorbia eriantha	beetle spurge								
Fabaceae – Legume Family										
	Acacia gregii	catclaw								
	Astragalus nuttallianus var. *imperfectus*	turkey peas								
	Astragalus insularis var. *harwoodii*	Harwood's milkvetch								
	Cercidium floridium ssp. *floridium*	blue palo verde		X				X	X	X
	Dalea mollis	silky dalea, hairy prairie clover		X			X	X	X	
	Lotus wrangelianus	Chilean bird's-foot trefoil								
	Lupinus cf. *arizonicus*	Arizona lupine		X				X	X	
	Marina parryi	Parry's false prairie clover								
	Olneya tesota	ironwood		X				X	X	
	Prosopis glandulosa	honey mesquite								
	Psorothamnus spinosum	smoke tree								
	Senna armata	spiny senna, desert senna								
Fouquieriaceae – Ocotillo Family										
	Fouquieria splendens ssp. *splendens*	ocotillo		X	X			X		X
Geraniaceae – Geranium Family										
	Erodium texanum	Texas storksbill, Desert Heron's Bill				X		X		X
Hydrophyllaceae – Waterleaf Family										
	Eucrypta micrantha	dainty desert hideseed			X				X	
	Nama demissum var. *demissum*	purplemat			X			X		
	Phacelia crenulata var. *ambigua*	purplestem phacelia			X			X	X	
	Phacelia crenulata var. *minutiflora*	cleftleaf wildheliotrope								
Krameriaceae – Rhatany Family										
	Krameria erecta	Pima rharany, littleleaf ratany								
	Krameria grayi	white rhatany				X		X		
Lamiaceae – Mint Family										
	Hyptis emoryi	desert-lavender								
Loasaceae – Loasa Family										
	Mentzelia cf. *albicaulis*	small flowered blazing star, white stemmed stickleaf			X		X			
	Mentzelia involucrata	whitebract blazingstar		X				X		
Malvaceae – Mallow Family										
	Eremalche rotundifolia	desert five-spot		X	X			X	X	X
	Hibiscus denudatus	paleface			X			X		
	Sphaeralcea ambigua	desert globemallow , apricot mallow		X	X			X		
Martyniaceae – Unicorn-Plant Family										
	Proboscidea althaeifolia	desert unicorn-plant								
Nyctaginaceae – Four O'Clock Family										

Family	Scientific Name	Common Name	Phenology(ies)				Day(s)			
			D	V	B	F	M	T	W	Th
	Allionia incarnata	trailing allionia, windmills								
Onagraceae – Evening Primrose Family										
	Camissonia boothii ssp. *desertorum*	desert suncup			X			X	X	
	Camissonia brevipes ssp. *brevipes*	golden suncup			X		X	X	X	
	Camissonia cf. *cardiophylla*	heartleaf suncup								
	Camissonia claviformis	browneyes			X		X	X	X	X
CF	*Camissonia refracta*	narrowleaf suncup		X					X	
Papaveraceae – Poppy Family										
	Eschscholzia glyptosperma	desert poppy , desert golden poppy			X		X	X	X	
	Eschscholzia minutiflora	pygmy poppy, Coville's poppy			X			X	X	
Plantaginaceae – Plantain Family										
	Plantago ovata	desert Indianwheat, woolly plantain		X	X	X	X	X	X	X
Polemoniaceae – Phlox Family										
	Gilia brecciarum ssp. *brecciarum*	Nevada gilia								
	Gilia latifolia	broadleaf gilia								
CF	*Gilia stellata*	star gilia			X			X		
	Langloisia setosissima ssp. *setosissima*	bristly langloisia		X				X		
	Linanthus jonesii	Jones' linanthus								
	Loeseliastrum schottii	Schott's calico								
Polygonaceae – Buckwheat Family										
	Chorizanthe brevicornu var. *brevicornu*	brittle spineflower			X			X	X	
	Chorizanthe corrugata	wrinkled spineflower		X			X	X		
	Chorizanthe rigida	spiny-herb		X			X	X		
	Eriogonum inflatum	desert trumpet		X					X	
	Eriogonum reniforme	kidneyleaf buckwheat								
	Eriogonum thomasii	Thomas Eriogonum								
	Eriogonum trichopes	little deserttrumpet								
Resedaceae – Mignonette Family										
	Oligomeris linifolia	lineleaf whitepuff								
Rhamnaceae – Buckthorn Family										
	Colubrina californica	las animas colubrina								
	Ziziphus cf. *obtusifolia* var. *canescens*	graythorn								
Scrophulariaceae – Figwort Family										
	Antirrhinum filipes	twining snapdragon								
	Mohavea confertiflora	ghost flower								
Solanaceae – Nightshade Family										
	Lycium andersonii	water jacket, Anderson's desert thorn			X				X	X
	Physalis hederifolia var. *fendleri*	Fendler's groundcherry								

Family	Scientific Name	Common Name	Phenology(ies)				Day(s)			
			D	V	B	F	M	T	W	Th
Tamaricaceae – Tamarisk Family										
	Tamarx sp. *	Tamarisk								
Viscaceae – Mistletoe Family										
	Phoradendron californicum	desert mistletoe	X							X
Zygophyllaceae – Caltrop Family										
	Fagonia laevis	California fagonbush			X			X	X	
	Larrea tridentata	creosote bush			X	X	X	X	X	X
	Kallstroemia parviflora	warty caltrop								
RARE PLANT TARGET LIST										
	Acleisanthes longiflora	Angel trumpets								
	Androstephium breviflorum	small-flowered androstephium								
	Astragalus insularis var. harwoodii	Harwood's milkvetch								
	Astragalus lentiginosus var. coachellae	Coachella Valley milkvetch								
	Ayenia compacta	California ayenia								
	Calliandra eriophylla	Fairyduster								
	Calochortus striatus	Alkali mariposa-lily								
	Castela emoryi	Crucifixion thorn								
	Chamaesyce abramsiana	Abram's spurge ✓								
	Chamaesyce platysperma	Flat-seeded spurge ✓								
	Colubrina californica	Las Animas colubrine								
	Condalia globosa var. pubescens	bitter snakewood								
	Corypantha alversonii	Foxtail cactus								
	Cryptantha costata	ribbed cryptantha ✓			X	X	X			
	Cryptantha holoptera	winged cryptantha								
	Cynanchum utahense	Utah milkvine		X	X					X
	Ditaxis claryana	glandular ditaxis								
	Ditaxis serrata var. californica	California ditaxis								
	Echinocactus polycephalus var. polycephalus	cottontop cactus								
	Echinocereus engelmannii	hedgehog cactus								
	Echinocereus triglochidiatus	hedgehog cactus								
	Eriastrum harwoodii	Harwood's wollystar SAND ✓								
	Ferocactus cylindraceus	California barrel cactus								
	Horsfordia alata	pink velvet mallow WASHES & WIDE PLACES								
	Hymenoxys odorata	bitter hymenoxys								
	Imperata brevifolia	California satintail ✓								
	Matelea parvifolia	spearleaf								
	Mentzelia puberula	Argus blazing star ROCKS ✓								
	Physalis lobata	lobed ground cherry WASH ✓								
	Portulaca halimoides	desert portulaca GENERAL ✓ ALLUVIAL TERRACE								
	Proboscidea althaeifolia	desert unicorn plant								
	Salvia greatae	Orocopia sage								
	Selaginella eremophila	Desert spikemoss								
	Senna covesii	Coves' cassia								
	Teucrium cubense ssp. depressum	dwarf germander								

Family	Scientific Name	Common Name	Phenology(ies)				Day(s)			
			D	V	B	F	M	T	W	Th
	Wislizenia refracta ssp. refracta	Jackass clover								
	Xylorhiza orcuttii	Orcutt's Woody-aster								
OTHER SPECIES NEW TO LIST										
	STREPTANTHELLA				X	X	X			
	CHAMACHIS GLABRATA				X		X			
	HESPEROCAULIS	DESERT LILY		X			X		X	X
?	ACHAMRONICHIA COOPERI						X			
	OENETHERA DELTOIDES				X		X			
	RAFINESQUIA NEOMEXICANA				X	X	X	X		
	BAILEYA PODORADIATA				X		X			
	DICORIA CANESCENS CANESCENS			X			X			
	DALEA MOLLIS		X				X			
	MENTZELIA SP.				X		X			
	STILLINGIA SPINULOSA			X			X			
	ASTRAGALUS ARIDUS			X	X		X			
DRAW ENDS →	CAMISSONIA / CALIFORNICA	← TACK STEM			X		X	X		
	PECTOCARYA PLATYCARPA	(CURVED BACK HOOK)				X	X	X	X	
	HETEROCARPA	(CURVED FORWARD HOOK)				X	X	X	X	
	ARISTIDA CALIFORNICA		X				X			
	GERETA → SUNFLOWER			X			X	X		
	CHORIZANTHE RIGIDA		X	X			X	X	X	
	C. " BREVICORNU			X			X	X		
	PHACELIA NEGLECTA				X		X	X		
	LOTUS STRIGOSUS VAR. TOMENTELLUS					X	X	X	X	
	PHACELIA CRENULATA VAR. AMBIGUA				X		X			
	ASTRAGALUS DIDYMOCARPUS				X	X	X			
	CRYPTANTHA MARITIMA (VAR PILOSA?)				X	X	X			

* Nonnative species CRYPTANTHA NAVARONE (F) TU/W

B1 = BIBBO → G Sm 8
B2 = WOOLLEY → T13
B3 = SPRUL → G Sm 9
B4 = HARPER → T130
B5 = BERGMAN → G Sm 5
B6 = DUFFELS → Sm 12
B7 = SANDERS
B8 = ONKAR

NEMACLADUS RAMOSISSIMUS (CF)
PLEUROCORONIS PLURIPETA (V)
TURTLE BACK (V WED)
AGROMIA? VILLOSA?
STREPTANTHELLA LONGIRSTRIS (F, WED)
SISYMBRIUM IRIO ✓ (F WED/THU)
CRYPTANTHA MICRANTHA (F THU)

SANDERS PERS. COMM.
① RAIN IS POOR HERE, NOT NECESSARILY AS GOOD AS THE DOUGLAS
② C. PTEROCARYA VAR. PTEROCARYA ← NO HERE → CYCLOP
③ CVM SURVEYS NOT NEEDED IT'S A. LONG. VIRABILIS

BLYTHE SOLAR POWER PROJECT

SPRING 2010 BOTANICAL SURVEYS

SCAN DETAILS

Surveyor	Woolley, Lance
Scanned By	Harper, Kyle
Scan Date	05.17.2010

BLYTHE

3/15/10, 3/16/10, 3/17/10 & 3/18/10 LANCE WOOLLEY

Family	Scientific Name	Common Name	Phenology(ies)				Day(s)			
			D	V	B	F	M	T	W	Th
GNETALES										
Ephedraceae – Ephedta Family										
	Ephedra sp.	ephedra								
MONOCOTS										
Poaceae – Grass Family										
	Aristida adscensionis	sixweeks threeawn								
	Aristida purpurea	purple threeawn								
	Bouteloua barbata var. *barbata*	sixweeks grama								
	Bromus madritensis ssp. *rubens**	red brome, foxtail chess								
	Erioneuron pulchellum (*syn. Dasyochloa pulchella*)	fluff grass								
	Pleuraphis rigida	big galleta grass								
	Schismus sp.*	Mediterranean grass				✓	✓	✓	✓	✓
	*Vulpia bromoides**	brome fescue								
	Vulpia octoflora	sixweeks fescue			✓			✓		
DICOTS										
Asclepiadaceae – Milkweed Family										
	Asclepias subulata	rush milkweed		✓				✓		
	Cynanchum utahense	Utah cynanchum			✓			✓		✓
	Sarcostemma cynanchoides ssp. *hartwegii*	climbing milkweed							✓	✓
	Sarcostemma hirtellum	trailing townula, hairy milkweed			✓			✓		
Asteraceae – Sunflower Family										
	Adenophyllum porophylloides	San Felipe dyssodia								
	Ambrosia dumosa	burroweed , white bursage			✓		✓	✓	✓	✓
	Atrichoseris platyphylla	parachute plant , gravel ghost		✓				✓		
	Bebbia juncea var. *aspera*	sweetbush		✓				✓	✓	
	Calycoseris wrightii	white tackstem			✓			✓	✓	✓
	Chaenactis carphoclinia	pebble pincushion								
	Chaenactis stevioides	desert pincushion			✓		✓	✓	✓	✓
	Encelia farinosa	brittlebush, incienso			✓		✓	✓	✓	
	Encelia frutescens	button brittlebush								✓
	Geraea canescens	desert-sunflower		✓			✓	✓	✓	
	Hymenoclea salsola	cheesebush								✓
	Malacothrix glabrata	desert dandelion			✓			✓	✓	✓
	Monoptilon bellioides	Mojave desertstar			✓			✓	✓	
	Palafoxia arida var. *arida*	Spanish needle, desert palafox					✓			✓
	Perityle emoryi	Emory's rockdaisy			✓					
	Pectis papposa	chinchweed								
	Porophyllum gracile	odora								
	Prenanthella exigua	brightwhite								
	Rafinesquia neomexicana	desert chicory			✓			✓	✓	✓
	Senecio mohavensis	Mojave ragwort, Mohave Groundsel			✓			✓		

Family	Scientific Name	Common Name	Phenology(ies)				Day(s)			
			D	V	B	F	M	T	W	Th
	Stephanomeria pauciflora var. *pauciflora*	wire lettuce		✓				✓	✓	✓
	Trichoptilium incisum	yellowhead, yellowdome			✓			✓		
	Trixis californica var. *californica*	American threefold								
Boraginaceae – Borage Family										
	Amsinckia menziesii var. *menziesii*	rancher's fireweed								
	Cryptantha angustifolia	narrow leaved cryptantha				✓	✓	✓	✓	✓
	Cryptantha barbigera	bearded cryptantha				✓		✓	✓	✓
	Cryptantha costata	ribbed cryptantha			✓		✓			
	Cryptantha maritima	Guadalupe cryptantha				✓		✓	✓	✓
	Cryptantha pterocarya	wingnut cryptantha				✓		✓		
	Pectocarya penicillata	chuckwalla combseed								
	Pectocarya platycarpa	broadfruit combseed				✓	✓	✓	✓	✓
	Tiquilia plicata	fanleaf crinklemat, plicate coldenia								
Brassicaceae – Mustard Family										
	*Brassica tournefortii**	Saharan mustard, Sahara mustard			✓		✓	✓	✓	✓
	Dithyrea californica	spectacle-pod				✓	✓			✓
	Guillenia lasiophyllum	California mustard			✓			✓	✓	✓
	Lepidium ~~sp.~~ lasiocarpum	pepperweed						✓	✓	✓
	Tropidocarpum gracile	dobie pod								
Cactaceae – Cactus Family										
	Echinocactus polycephalus var. *polycephalus*	cottontop cactus, clustered barrel cactus								
	Ferocactus cylindraceus var. *cylindraceus*	California barrel cactus								
	Mammillaria tetrancistra	common fishhook cactus		✓				✓		
	Opuntia basilaris	beavertail cactus		✓				✓		
	Opuntia echinocarpa (*Cylindropuntia e.*)	silver cholla, golden cholla		✓		✓		✓	✓	✓
	Opuntia ramosissima (*Cylindropuntia r.*)	pencil cactus, diamond cholla								
Chenopodiaceae – Goosefoot Family										
	Atriplex polycarpa	allscale saltbrush								
	Atriplex hymenelytra	desert holly								
	Chenopodium murale	nettleleaf goosefoot		✓				✓	✓	
	Chenopodium sp.	goosefoot								
	*Salsola tragus**	Russian thistle, tumbleweed		✓			✓			
Cucurbitaceae – Gourd Family										
	Brandegea bigelovii	desert starvine								✓
Euphorbiaceae – Spurge Family										
	Chamaesyce polycarpa	smallseed sandmat			✓			✓	✓	✓
	Ditaxis lanceolata	Narrowleaf ditaxis, narrowleaf silverbush			✓			✓	✓	✓
	Ditaxis neomexicana	New Mexico ditaxis								

Family	Scientific Name	Common Name	Phenology(ies)				Day(s)			
			D	V	B	F	M	T	W	Th
	Euphorbia eriantha	beetle spurge								
Fabaceae – Legume Family										
	Acacia gregii	catclaw		✓				✓	✓	✓
	Astragalus nuttallianus var. *imperfectus*	turkey peas								
	Astragalus insularis var. *harwoodii*	Harwood's milkvetch								
	Cercidium floridium ssp. *floridium*	blue palo verde		✓				✓	✓	✓
	Dalea mollis	silky dalea, hairy prairie clover			✓		✓			
	Lotus wrangelianus	Chilean bird's-foot trefoil								
	Lupinus arizonicus	Arizona lupine		✓				✓	✓	
	Marina parryi	Parry's false prairie clover		✓				✓		
	Olneya tesota	ironwood		✓				✓	✓	✓
	Prosopis glandulosa	honey mesquite								
	Psorothamnus spinosum	smoke tree								✓
	Senna armata	spiny senna, desert senna								
Fouquieriaceae – Ocotillo Family										
	Fouquieria splendens ssp. *splendens*	ocotillo							✓	
Geraniaceae – Geranium Family										
	Erodium texanum	Texas storksbill, Desert Heron's Bill		✓		✓		✓	✓	✓
Hydrophyllaceae – Waterleaf Family										
	Eucrypta micrantha	dainty desert hideseed			✓			✓	✓	
	Nama demissum var. *demissum*	purplemat			✓			✓	✓	
	Phacelia crenulata var. *ambigua*	purplestem phacelia			✓			✓	✓	✓
	Phacelia crenulata var. *minutiflora*	cleftleaf wildheliotrope								
Krameriaceae – Rhatany Family										
	Krameria erecta	Pima rharany, littleleaf ratany		✓				✓		✓
	Krameria grayi	white rhatany							✓	✓
Lamiaceae – Mint Family										
	Hyptis emoryi	desert-lavender			✓			✓	✓	✓
Loasaceae – Loasa Family										
	Mentzelia cf. *albicaulis*	small flowered blazing star, white stemmed stickleaf							✓	✓
	Mentzelia involucrata	whitebract blazingstar			✓			✓		
Malvaceae – Mallow Family										
	Eremalche rotundifolia	desert five-spot			✓			✓	✓	✓
	Hibiscus denudatus	paleface			✓			✓	✓	
	Sphaeralcea ambigua	desert globemallow , apricot mallow								
Martyniaceae – Unicorn-Plant Family										
	Proboscidea althaeifolia	desert unicorn-plant		✓				✓		
Nyctaginaceae – Four O'Clock Family										

Family	Scientific Name	Common Name	Phenology(ies)				Day(s)			
			D	V	B	F	M	T	W	Th
	Allionia incarnata	trailing allionia, windmills			✓			✓		
Onagraceae – Evening Primrose Family										
	Camissonia boothii ssp. *desertorum*	desert suncup		✓				✓	✓	✓
	Camissonia brevipes ssp. *brevipes*	golden suncup								
	Camissonia cf. *cardiophylla*	heartleaf suncup								
	Camissonia claviformis	browneyes			✓		✓		✓	✓
	Camissonia refracta	narrowleaf suncup								
Papaveraceae – Poppy Family										
	Eschscholzia glyptosperma	desert poppy , desert golden poppy			✓			✓	✓	
	Eschscholzia minutiflora	pygmy poppy, Coville's poppy			✓			✓	✓	✓
Plantaginaceae – Plantain Family										
	Plantago ovata	desert Indianwheat, woolly plantain			✓			✓	✓	✓
Polemoniaceae – Phlox Family										
	Gilia brecciarum ssp. *brecciarum*	Nevada gilia								
	Gilia latifolia	broadleaf gilia								
	Gilia stellata	star gilia			✓			✓	✓	✓
	Langloisia setosissima ssp. *setosissima*	bristly langloisia			✓			✓		
	Linanthus jonesii	Jones' linanthus			✓			✓		
	Loeseliastrum schottii	Schott's calico								
Polygonaceae – Buckwheat Family										
	Chorizanthe brevicornu var. *brevicornu*	brittle spineflower			✓			✓	✓	✓
	Chorizanthe corrugata	wrinkled spineflower								
	Chorizanthe rigida	spiny-herb			✓			✓	✓	✓
	Eriogonum inflatum	desert trumpet			✓			✓	✓	
	Eriogonum reniforme	kidneyleaf buckwheat								
	Eriogonum thomasii	Thomas Eriogonum			✓			✓	✓	✓
	Eriogonum trichopes	little deserttrumpet								
Resedaceae – Mignonette Family										
	Oligomeris linifolia	lineleaf whitepuff								
Rhamnaceae – Buckthorn Family										
	Colubrina californica	las animas colubrina								
	Ziziphus cf. *obtusifolia* var. *canescens*	graythorn								
Scrophulariaceae – Figwort Family										
	Antirrhinum filipes	twining snapdragon								
	Mohavea confertiflora	ghost flower			✓			✓		
Solanaceae – Nightshade Family										
	Lycium andersonii	water jacket, Anderson's desert thorn			✓			✓	✓	✓
	Physalis hederifolia var. *fendleri*	Fendler's groundcherry								

Family	Scientific Name	Common Name	Phenology(ies)				Day(s)			
			D	V	B	F	M	T	W	Th
Tamaricaceae – Tamarisk Family										
	Tamarx sp. *	Tamarisk								
Viscaceae – Mistletoe Family										
	Phoradendron californicum	desert mistletoe		✓			✓	✓	✓	✓
Zygophyllaceae – Caltrop Family										
	Fagonia laevis	California fagonbush			✓			✓		
	Larrea tridentata	creosote bush		✓	✓		✓	✓	✓	✓
	Kallstroemia parviflora	warty caltrop								
RARE PLANT TARGET LIST										
	Acleisanthes longiflora	Angel trumpets								
	Androstephium breviflorum	small-flowered androstephium								
	Astragalus insularis var. harwoodii	Harwood's milkvetch								
	Astragalus lentiginosus var. coachellae	Coachella Valley milkvetch								
	Ayenia compacta	California ayenia								
	Calliandra eriophylla	Fairyduster								
	Calochortus striatus	Alkali mariposa-lily								
	Castela emoryi	Crucifixion thorn								
	Chamaesyce abramsiana	Abram's spurge								
	Chamaesyce platysperma	Flat-seeded spurge								
	Colubrina californica	Las Animas colubrine								
	Condalia globosa var. pubescens	bitter snakewood								
	Corypantha alversonii	Foxtail cactus								
	Cryptantha costata	ribbed cryptantha								
	Cryptantha holoptera	winged cryptantha								
	Cynanchum utahense	Utah milkvine			✓			✓		✓
	Ditaxis claryana	glandular ditaxis								
	Ditaxis serrata var. californica	California ditaxis								
	Echinocactus polycephalus var. polycephalus	cottontop cactus								
	Echinocereus engelmannii	hedgehog cactus								
	Echinocereus triglochidiatus	hedgehog cactus								
	Eriastrum harwoodii	Harwood's wollystar								
	Ferocactus cylindraceus	California barrel cactus								
	Horsfordia alata	pink velvet mallow								
	Hymenoxys odorata	bitter hymenoxys								
	Imperata brevifolia	California satintail								
	Matelea parvifolia	spearleaf								
	Mentzelia puberula	Argus blazing star								
	Physalis lobata	lobed ground cherry								
	Portulaca halimoides	desert portulaca								
	Proboscidea althaeifolia	desert unicorn plant								
	Salvia greatae	Orocopia sage								
	Selaginella eremophila	Desert spikemoss								
	Senna covesii	Coves' cassia								
	Teucrium cubense ssp. depressum	dwarf germander								

Family	Scientific Name	Common Name	Phenology(ies)				Day(s)			
			D	V	B	F	M	T	W	Th
	Wislizenia refracta ssp. refracta	Jackass clover								
	Xylorhiza orcuttii	Orcutt's Woody-aster								
OTHER SPECIES NEW TO LIST										
*	Cryptantha holoptera *				✓	✓		✓		
	CNPS LIST 4									
	Dalea mollissima			✓				✓		
	Lotus strigosus var. tomentellus				✓	✓		✓	✓	✓
	Cryptantha nevadensis							✓	✓	✓
	Plagiobothrys jonesii							✓	✓	✓
	Amsinckia tesselata							✓	✓	✓
	Rectocarpa recurvata							✓	✓	
	Sisymbrium irio				✓			✓	✓	✓
	Stephanomeria exigua				✓			✓		
	Rectocarpa heterocarpa							✓	✓	✓
	Nemacladus sp.			✓				✓		
	Phacelia neglecta				✓			✓	✓	✓
	Streptanthella longirostris					✓	✓		✓	✓
	Astragalus arido			✓			✓			
	Dicoria canescens					✓				
	Baileya pauciradiata					✓	✓			
	Oenothera deltoides				✓		✓			
	Stillingia spinulosa			✓			✓			
	Oenothera primiveris									✓
	Nicotiana clevelandii									✓
	Achyronychia cooperi									✓
	Descurania sp.									✓

* Nonnative species

3/18/2010 - McCoy Wash

Piece of Tortoise shell
1" wide by 3" long

UTM
0 12406
3 9 3 0 8 1 5

TOOK PHOTO

"Rite in the Rain"

BLYTHE SOLAR POWER PROJECT

SPRING 2010 BOTANICAL SURVEYS

SCAN DETAILS

Surveyor	Bibbo, Mark
Scanned By	Harper, Kyle
Scan Date	05.17.2010

M. Gibbo wk of 3/8

BLYTHE

3 surveyors GPS #8

Family	Scientific Name	Common Name	Phenology(ies)				Day(s)			
			D	V	B	F	M	T	W	Th
GNETALES										
Ephedraceae – Ephedta Family										
	Ephedra sp.	ephedra								
MONOCOTS										
Poaceae – Grass Family										
	Aristida adscensionis	sixweeks threeawn								
	Aristida purpurea	purple threeawn								
	Bouteloua barbata var. *barbata*	sixweeks grama								
	Bromus madritensis ssp. *rubens**	red brome, foxtail chess								
	Erioneuron pulchellum (*syn. Dasyochloa pulchella*)	fluff grass								
	Pleuraphis rigida	big galleta grass			✓		✓			
	Schismus sp.*	Mediterranean grass			✓		✓			
	*Vulpia bromoides**	brome fescue								
	Vulpia octoflora var. o	sixweeks fescue			✓		✓			
DICOTS										
Asciepiadaceae – Milkweed Family										
	Asclepias subulata	rush milkweed								
	Cynanchum utahense	Utah cynanchum								
	Sarcostemma cynanchoides ssp. *hartwegii*	climbing milkweed								
	Sarcostemma hirtellum	trailing townula, hairy milkweed								
Asteraceae – Sunflower Family										
	Adenophyllum porophylloides	San Felipe dyssodia								
	Ambrosia dumosa	burroweed , white bursage			✓		✓			
	Atrichoseris platyphylla	parachute plant , gravel ghost		✓			✓			
	Bebbia juncea var. *aspera*	sweetbush		✓			✓			
	Calycoseris wrightii	white tackstem								
	Chaenactis carphoclinia	pebble pincushion								
	Chaenactis stevioides	desert pincushion			✓		✓			
	Encelia farinosa	brittlebush, incienso			✓		✓			
	Encelia frutescens	button brittlebush								
	Geraea canescens	desert-sunflower		✓			✓			
	Hymenoclea salsola	cheesebush		✓				✓		
	Malacothrix glabrata	desert dandelion								
	Monoptilon bellioides	Mojave desertstar			✓		✓			
	Palafoxia arida var. *arida*	Spanish needle, desert palafox			✓			✓		
	Perityle emoryi	Emory's rockdaisy								
	Pectis papposa	chinchweed								
	Porophyllum gracile	odora			✓			✓		
	Prenanthella exigua	brightwhite								
	Rafinesquia neomexicana	desert chicory			✓		✓			
	Senecio mohavensis	Mojave ragwort, Mohave Groundsel								
	Stephanomeria pauciflora var. *pauciflora*	wire lettuce		✓				✓		

Family	Scientific Name	Common Name	Phenology(ies)				Day(s)			
			D	V	B	F	M	T	W	Th
	Trichoptilium incisum	yellowhead, yellowdome								
	Trixis californica var. *californica*	American threefold								
Boraginaceae – Borage Family										
	Amsinckia menziesii var. *menziesii*	rancher's fireweed								
	Cryptantha angustifolia	narrow leaved cryptantha			✓	✓	✓			
	Cryptantha barbigera	bearded cryptantha					maybe			
	Cryptantha costata	ribbed cryptantha			✓	✓		✓		
	Cryptantha maritima	Guadalupe cryptantha			✓	✓	✓			
	Cryptantha pterocarya	wingnut cryptantha			✓	✓	✓			
	Pectocarya penicillata	chuckwalla combseed			✓	✓		✓		
	Pectocarya platycarpa	broadfruit combseed			✓	✓	✓			
	Tiquilia plicata	fanleaf crinklemat, plicate coldenia								
Brassicaceae – Mustard Family										
	*Brassica tournefortii**	Saharan mustard, Sahara mustard			✓		✓			
	Dithyrea californica	spectacle-pod				✓	✓	✓		
	Guillenia lasiophyllum	California mustard			✓		✓			
	Lepidium ~~sp.~~ lichyoluen	pepperweed				✓	✓			
	Tropidocarpum gracile	dobie pod								
Cactaceae – Cactus Family										
	Echinocactus polycephalus var. *polycephalus*	cottontop cactus, clustered barrel cactus								
	Ferocactus cylindraceus var. *cylindraceus*	California barrel cactus								
	Mammillaria tetrancistra	common fishhook cactus								
	Opuntia basilaris	beavertail cactus								
	Opuntia echinocarpa (*Cylindropuntia e.*)	silver cholla, golden cholla		✓			✓			
	Opuntia ramosissima (*Cylindropuntia r.*)	pencil cactus, diamond cholla								
Chenopodiaceae – Goosefoot Family										
	Atriplex polycarpa	allscale saltbrush								
	Atriplex hymenelytra	desert holly								
	Chenopodium murale	nettleleaf goosefoot								
	Chenopodium sp.	goosefoot								
	*Salsola tragus**	Russian thistle, tumbleweed		✓				✓		
Cucurbitaceae – Gourd Family										
	Brandegea bigelovii	desert starvine								
Euphorbiaceae – Spurge Family										
	Chamaesyce ~~*polycarpa*~~ micro*	smallseed sandmat		✓	✓		✓			
	Ditaxis lanceolata	Narrowleaf ditaxis, narrowleaf silverbush								
	Ditaxis neomexicana	New Mexico ditaxis								
	Euphorbia eriantha	beetle spurge								
Fabaceae – Legume Family										

Family	Scientific Name	Common Name	Phenology(ies)				Day(s)			
			D	V	B	F	M	T	W	Th
	Acacia gregii	catclaw								
	Astragalus nuttallianus var. *imperfectus*	turkey peas								
	Astragalus insularis var. *harwoodii*	Harwood's milkvetch			✓	✓		✓		
	Cercidium floridium ssp. *floridium*	blue palo verde		✓			✓			
	Dalea mollis	silky dalea, hairy prairie clover								
	Lotus wrangelianus	Chilean bird's-foot trefoil		✓	✓		✓			
	Lupinus cf. *arizonicus*	Arizona lupine								
	Marina parryi	Parry's false prairie clover								
	Olneya tesota	ironwood		✓			✓			
	Prosopis glandulosa	honey mesquite								
	Psorothamnus spinosum	smoke tree								
	Senna armata	spiny senna, desert senna								
Fouquieriaceae – Ocotillo Family										
	Fouquieria splendens ssp. *splendens*	ocotillo		✓	✓			✓		
Geraniaceae – Geranium Family										
	Erodium texanum	Texas storksbill, Desert Heron's Bill		✓	✓		✓			
Hydrophyllaceae – Waterleaf Family										
	Eucrypta micrantha	dainty desert hideseed								
	Nama demissum var. *demissum*	purplemat								
	Phacelia ~~*crenulata*~~ ~~var.~~ ~~*ambigua*~~ var. rotundifolia	purplestem phacelia		✓			✓			
	Phacelia crenulata var. *minutiflora*	cleftleaf wildheliotrope								
Krameriaceae – Rhatany Family										
	Krameria erecta	Pima rharany, littleleaf ratany								
	Krameria grayi	white rhatany		✓			✓			
Lamiaceae – Mint Family										
	Hyptis emoryi	desert-lavender								
Loasaceae – Loasa Family										
	Mentzelia ~~*cf. albicaulis*~~ sp	small flowered blazing star, white stemmed stickleaf		✓			✓			
	Mentzelia involucrata	whitebract blazingstar								
Malvaceae – Mallow Family										
	Eremalche rotundifolia	desert five-spot		✓				✓		
	Hibiscus denudatus	paleface								
	Sphaeralcea ambigua	desert globemallow , apricot mallow								
Martyniaceae – Unicorn-Plant Family										
	Proboscidea althaeifolia	desert unicorn-plant								
Nyctaginaceae – Four O'Clock Family										
	Allionia incarnata	trailing allionia, windmills								
Onagraceae – Evening Primrose Family										
	Camissonia boothii ssp. *desertorum*	desert suncup			✓		✓			

Family	Scientific Name	Common Name	Phenology(ies)				Day(s)			
			D	V	B	F	M	T	W	Th
	Camissonia brevipes ssp. *brevipes*	golden suncup								
	Camissonia cf. *cardiophylla*	heartleaf suncup								
	Camissonia claviformis	browneyes			✓			✓		
	Camissonia refracta	narrowleaf suncup								
Papaveraceae – Poppy Family										
	Eschscholzia glyptosperma	desert poppy , desert golden poppy								
	Eschscholzia minutiflora	pygmy poppy, Coville's poppy			✓		✓			
Plantaginaceae – Plantain Family										
	Plantago ovata	desert Indianwheat, woolly plantain			✓		✓	—	—	—
Polemoniaceae – Phlox Family										
	Gilia brecciarum ssp. *brecciarum*	Nevada gilia								
	Gilia latifolia	broadleaf gilia								
	Gilia stellata	star gilia								
	Langloisia setosissima ssp. *setosissima*	bristly langloisia								
	Linanthus jonesii	Jones' linanthus								
	Loeseliastrum schottii	Schott's calico		✓			✓			
Polygonaceae – Buckwheat Family										
	Chorizanthe brevicornu var. *brevicornu*	brittle spineflower			✓		✓			
	Chorizanthe corrugata	wrinkled spineflower								
	Chorizanthe rigida	spiny-herb								
	Eriogonum inflatum	desert trumpet		✓			✓			
	Eriogonum reniforme	kidneyleaf buckwheat		✓			✓			
	Eriogonum thomasii	Thomas Eriogonum								
	Eriogonum trichopes	little deserttrumpet								
Resedaceae – Mignonette Family										
	Oligomeris linifolia	lineleaf whitepuff								
Rhamnaceae – Buckthorn Family										
	Colubrina californica	las animas colubrina								
	Ziziphus cf. *obtusifolia* var. *canescens*	graythorn								
Scrophulariaceae – Figwort Family										
	Antirrhinum filipes	twining snapdragon								
	Mohavea confertiflora	ghost flower								
Solanaceae – Nightshade Family										
	Lycium andersonii	water jacket, Anderson's desert thorn			✓		✓			
	Physalis hederifolia var. *fendleri*	Fendler's groundcherry								
Tamaricaceae – Tamarisk Family										
	Tamarx sp. *	Tamarisk								
Viscaceae – Mistletoe Family										
	Phoradendron californicum	desert mistletoe								

Family	Scientific Name	Common Name	Phenology(ies)				Day(s)			
			D	V	B	F	M	T	W	Th
Zygophyllaceae – Caltrop Family										
	Fagonia laevis	California fagonbush								
	Larrea tridentata	creosote bush			✓		✓			
	Kallstroemia parviflora	warty caltrop								
RARE PLANT TARGET LIST										
	Acleisanthes longiflora	Angel trumpets								
	Androstephium breviflorum	small-flowered androstephium								
	Astragalus insularis var. harwoodii	Harwood's milkvetch								
	Astragalus lentiginosus var. coachellae	Coachella Valley milkvetch								
	Ayenia compacta	California ayenia								
	Calliandra eriophylla	Fairyduster								
	Calochortus striatus	Alkali mariposa-lily								
	Castela emoryi	Crucifixion thorn								
	Chamaesyce abramsiana	Abram's spurge								
	Chamaesyce platysperma	Flat-seeded spurge								
	Colubrina californica	Las Animas colubrine								
	Condalia globosa var. pubescens	bitter snakewood								
	Corypantha alversonii	Foxtail cactus								
	Cryptantha costata	ribbed cryptantha								
	Cryptantha holoptera	winged cryptantha								
	Cynanchum utahense	Utah milkvine								
	Ditaxis claryana	glandular ditaxis								
	Ditaxis serrata var. californica	California ditaxis								
	Echinocactus polycephalus var. polycephalus	cottontop cactus								
	Echinocereus engelmannii	hedgehog cactus								
	Echinocereus triglochidiatus	hedgehog cactus								
	Eriastrum harwoodii	Harwood's wollystar								
	Ferocactus cylindraceus	California barrel cactus								
	Horsfordia alata	pink velvet mallow								
	Hymenoxys odorata	bitter hymenoxys								
	Imperata brevifolia	California satintail								
	Matelea parvifolia	spearleaf								
	Mentzelia puberula	Argus blazing star								
	Physalis lobata	lobed ground cherry								
	Portulaca halimoides	desert portulaca								
	Proboscidea althaeifolia	desert unicorn plant								
	Salvia greatae	Orocopia sage								
	Selaginella eremophila	Desert spikemoss								
	Senna covesii	Coves' cassia								
	Teucrium cubense ssp. depressum	dwarf germander								
	Wislizenia refracta ssp. refracta	Jackass clover								
	Xylorhiza orcuttii	Orcutt's Woody-aster								
OTHER SPECIES NEW TO LIST										

Family	Scientific Name	Common Name	Phenology(ies)				Day(s)			
			D	V	B	F	M	T	W	Th
	Hesperocallis undulata				✓		✓			
	Achyronychia cooperi				✓		✓			
	Phacelia rotundifolia									
	Cryptantha nevadensis				✓		✓			
	Oenothera tetta				✓			✓		
	Sisymbrium irio				✓		✓			
	Astragalus (aridus)			✓	✓			✓		
	Streptanthella longirostris			✓	✓			✓		
	Bicoria canescens			✓				✓		
	Psorothamnus (emoryi)			✓				✓		

* Nonnative species

wk of 3/22
M. Gibbs

BLYTHE

INSTRUCTIONS: Please mark the plant species you see, including the day(s) of observation and the phenology(ies) observed. Mark the DOMINANT phenology with an "X", and all other observed phonologies with an "O".

There is additional room for new species at the bottom of each list.

If you observe a species that you are not sure of... please collect it! If you can't collect it because it is not fruiting, etc. or the population is too small, then photograph it! Take it back to the motel and key the darn thing if you can. It is on, or may be on, our rare plant hit list. ☺

-MGibbs 3/25

Phenology Codes: D = Dead/Dormant, V = Vegetative, B = Blooming, F = Fruiting

Family	Scientific Name	Common Name	Phenology(ies)				Day(s)			
			D	V	B	F	M	T	W	Th
GNETALES										
Ephedraceae – Ephedta Family										
	Ephedra sp.	ephedra								
MONOCOTS										
Agavaceae – Century Plant Family										
	Hesperocallis undulata	desertlily								✓
Poaceae – Grass Family										
	Aristida adscensionis	sixweeks threeawn								
	Aristida purpurea	purple threeawn								
	Bouteloua barbata var. *barbata*	sixweeks grama								
	Bromus madritensis ssp. *rubens**	red brome, foxtail chess								
	Erioneuron pulchellum (*syn. Dasyochloa pulchella*)	fluff grass								
	Pleuraphis rigida	big galleta grass								✓
	*Schismus arabicus**	Mediterranean grass								✓
	*Vulpia bromoides**	brome fescue								
	Vulpia octoflora	sixweeks fescue								
DICOTS										
Asclepiadaceae – Milkweed Family										
	Asclepias subulata	rush milkweed								
	Cynanchum utahense	Utah cynanchum								
	Sarcostemma cynanchoides	climbing milkweed								

Family	Scientific Name	Common Name	Phenology(ies)				Day(s)			
			D	V	B	F	M	T	W	Th
	ssp. *hartwegii*									
	Sarcostemma hirtellum	trailing townula, hairy milkweed								
Asteraceae – Sunflower Family										
	Adenophyllum porophylloides	San Felipe dyssodia								
	Ambrosia dumosa	burroweed , white bursage								✓
	Atrichoseris platyphylla	parachute plant , gravel ghost								
	Bebbia juncea var. *aspera*	sweetbush								
	Calycoseris wrightii	white tackstem								✓
	Chaenactis carphoclinia	pebble pincushion								✓
	Chaenactis stevioides	desert pincushion								✓
	Encelia farinosa var. farinosa	brittlebush, incienso								✓
	Encelia farinosa var. phenicodonta	dark-eyed brittlebush								
	Encelia frutescens	button brittlebush								✓
	Geraea canescens	desert-sunflower								✓
	Hymenoclea salsola	cheesebush								✓
	Malacothrix glabrata	desert dandelion								✓
	Monoptilon bellioides	Mojave desertstar								
	Palafoxia arida var. *arida*	Spanish needle, desert palafox								
	Perityle emoryi	Emory's rockdaisy								
	Pectis papposa	chinchweed								
	Porophyllum gracile	odora								
	Prenanthella exigua	brightwhite								
	Rafinesquia neomexicana	desert chicory								✓
	Senecio mohavensis	Mojave ragwort, Mohave Groundsel								
	Stephanomeria exigua	small wire lettuce								
	Stephanomeria pauciflora var. *pauciflora*	wire lettuce								
	Trichoptilium incisum	yellowhead, yellowdome								
	Trixis californica var. *californica*	American threefold								
Boraginaceae – Borage Family										
	Amsinckia menziesii var. *menziesii*	rancher's fireweed								
	Amsinckia tessellata	fiddleneck								

Family	Scientific Name	Common Name	Phenology(ies)				Day(s)			
			D	V	B	F	M	T	W	Th
	Cryptantha angustifolia	narrow leaved cryptantha								✓
	Cryptantha barbigera	bearded cryptantha								✓
	Cryptantha costata	ribbed cryptantha								
	Cryptantha holoptera	winged cyptantha								
	Cryptantha maritima var. maritima	Guadalupe cryptantha								✓
	Cryptantha maritima var. pilosa	Guadalupe cryptantha								✓
	Cyptantha nevadensis var. nevadensis	Nevada catseye								
	Cryptantha pterocarya var. cycloptera	wingnut cryptantha								
	Pectocarya ~~penicillata~~ hebrewolf	chuckwalla combseed								✓
	Pectocarya platycarpa	broadfruit combseed								✓
	Pectocarya recurvata	curvenut combseed, combur								
	Plagiobothrys jonesii	Mojave popcornflower								
	Tiquilia palmeri	Palmer's coldenia								
	Tiquilia plicata	fanleaf crinklemat, plicate coldenia								
Brassicaceae – Mustard Family										
	*Brassica tournefortii**	Saharan mustard, Sahara mustard								✓
	Dithyrea californica	spectacle-pod								
	Guillenia lasiophyllum	California mustard								
	Lepidium lasiocarpum	pepperweed								✓
	*Sisymbrium irio**	London rocket								
	Tropidocarpum gracile	dobie pod								
Cactaceae – Cactus Family										
	Echinocactus polycephalus var. *polycephalus*	cottontop cactus, clustered barrel cactus								
	Ferocactus cylindraceus var. *cylindraceus*	California barrel cactus								

Family	Scientific Name	Common Name	Phenology(ies)				Day(s)			
			D	V	B	F	M	T	W	Th
	Mammillaria tetrancistra	common fishhook cactus								
	Opuntia basilaris	beavertail cactus								
	Opuntia echinocarpa (*Cylindropuntia e.*)	silver cholla, golden cholla								✓
	Opuntia ramosissima (*Cylindropuntia r.*)	pencil cactus, diamond cholla								
	Nemacladus	threadplant								
Chenopodiaceae – Goosefoot Family										
	Atriplex polycarpa	allscale saltbrush								
	Atriplex hymenelytra	desert holly								
	Chenopodium murale	nettleleaf goosefoot								
	Chenopodium sp.	goosefoot								
	*Salsola tragus**	Russian thistle, tumbleweed								
Cucurbitaceae – Gourd Family										
	Brandegea bigelovii	desert starvine								
Euphorbiaceae – Spurge Family										
	Chamaesyce polycarpa	smallseed sandmat								✓
	Ditaxis lanceolata	Narrowleaf ditaxis, narrowleaf silverbush								
	Ditaxis neomexicana	New Mexico ditaxis								
	Euphorbia eriantha	beetle spurge								
Fabaceae – Legume Family										
	Acacia gregii	catclaw								
	Astragalus nuttallianus var. *imperfectus*	turkey peas								
	Astragalus insularis var. *harwoodii*	Harwood's milkvetch								✓
	Cercidium floridium ssp. *floridium*	blue palo verde								✓
	Dalea mollis	silky dalea, hairy prairie clover								

Family	Scientific Name	Common Name	Phenology(ies)				Day(s)			
			D	V	B	F	M	T	W	Th
	Dalea mollissima	hairy dalea, downy dalea								✓
	Lotus strigosus var. tomentellus	strigose bird's-foot trefoil								✓
	Lotus wrangelianus	Chilean bird's-foot trefoil								
	Lupinus cf. *arizonicus*	Arizona lupine								
	Marina parryi	Parry's false prairie clover								
	Olneya tesota	ironwood								✓
	Prosopis glandulosa	honey mesquite								
	Psorothamnus spinosum	smoke tree								
	Senna armata	spiny senna, desert senna								
Fouquieriaceae – Ocotillo Family										
	Fouquieria splendens ssp. *splendens*	ocotillo								
Geraniaceae – Geranium Family										
	Erodium texanum	Texas storksbill, Desert Heron's Bill								✓
Hydrophyllaceae – Waterleaf Family										
	Eucrypta micrantha	dainty desert hideseed								
	Nama demissum var. *demissum*	purplemat								✓
	Phacelia crenulata var. *ambigua*	purplestem phacelia								✓
	Phacelia crenulata var. *minutiflora*	cleftleaf wildheliotrope								
	Phacelia neglecta	alkali phacelia								✓
Krameriaceae – Rhatany Family										
	Krameria erecta	Pima rharany, littleleaf ratany								
	Krameria grayi	white rhatany								✓

Family	Scientific Name	Common Name	Phenology(ies)				Day(s)			
			D	V	B	F	M	T	W	Th
Lamiaceae – Mint Family										
	Hyptis emoryi	desert-lavender								
Loasaceae – Loasa Family										
	Mentzelia cf. *albicaulis*	small flowered blazing star, white stemmed stickleaf								
	Mentzelia involucrata	whitebract blazingstar								
Malvaceae – Mallow Family										
	Eremalche rotundifolia	desert five-spot								✓
	Hibiscus denudatus	paleface								
	Sphaeralcea ambigua	desert globemallow , apricot mallow								
Martyniaceae – Unicorn-Plant Family										
	Proboscidea althaeifolia	desert unicorn-plant								
Nyctaginaceae – Four O'Clock Family										
	Abronia villosa var. *villosa*	desert sand verbena								✓
	Allionia incarnata	trailing allionia, windmills								
	Boerhavia	spiderling								
	Mirabilis bigelovii	wishbone bush								
Onagraceae – Evening Primrose Family										
	Camissonia boothii ssp. *desertorum*	desert suncup								✓
	Camissonia brevipes ssp. *brevipes*	golden suncup								
	Camissonia cf. *cardiophylla*	heartleaf suncup								
	Camissonia claviformis	browneyes								✓
	Camissonia refracta	narrowleaf suncup								

Family	Scientific Name	Common Name	Phenology(ies)				Day(s)			
			D	V	B	F	M	T	W	Th
Papaveraceae – Poppy Family										
	Eschscholzia glyptosperma	desert poppy , desert golden poppy								
	Eschscholzia minutiflora	pygmy poppy, Coville's poppy								✓
										^
Plantaginaceae – Plantain Family										
	Plantago ovata	desert Indianwheat, woolly plantain								✓
Polemoniaceae – Phlox Family										
	Gilia brecciarum ssp. *brecciarum*	Nevada gilia								
	Gilia latifolia	broadleaf gilia								
	Gilia stellata	star gilia								
	Langloisia setosissima ssp. *setosissima*	bristly langloisia								
	Linanthus jonesii	Jones' linanthus								
	Loeseliastrum schottii	Schott's calico								✓
Polygonaceae – Buckwheat Family										
	Chorizanthe brevicornu var. *brevicornu*	brittle spineflower								
	Chorizanthe corrugata	wrinkled spineflower								
	Chorizanthe rigida	spiny-herb								✓
	Eriogonum inflatum var. inflatum	desert trumpet								
	Eriogonum reniforme	kidneyleaf buckwheat								✓
	Eriogonum thomasii	Thomas Eriogonum								✓
	Eriogonum trichopes	little deserttrumpet								

Family	Scientific Name	Common Name	Phenology(ies)				Day(s)			
			D	V	B	F	M	T	W	Th
Resedaceae – Mignonette Family										
	Oligomeris linifolia	lineleaf whitepuff								
Rhamnaceae – Buckthorn Family										
	Colubrina californica	las animas colubrina								
	Ziziphus cf. *obtusifolia* var. *canescens*	graythorn								
Scrophulariaceae – Figwort Family										
	Antirrhinum filipes	twining snapdragon								
	Mohavea confertiflora	ghost flower								
Solanaceae – Nightshade Family										
	Lycium andersonii	water jacket, Anderson's desert thorn								
	Physalis hederifolia var. *fendleri*	Fendler's groundcherry								
Tamaricaceae – Tamarisk Family										
	Tamarix sp. *	Tamarisk								
Viscaceae – Mistletoe Family										
	Phoradendron californicum	desert mistletoe								
Zygophyllaceae – Caltrop Family										
	Fagonia laevis	California fagonbush								
	Larrea tridentata	creosote bush								
	Kallstroemia parviflora	warty caltrop								
RARE PLANT TARGET LIST										
	Acleisanthes longiflora	Angel trumpets								
	Androstephium breviflorum	small-flowered androstephium								
	Astragalus insularis var. harwoodii	Harwood's milkvetch								
	Astragalus lentiginosus var. coachellae	Coachella Valley milkvetch								
	Ayenia compacta	California ayenia								
	Calliandra eriophylla	Fairyduster								

Family	Scientific Name	Common Name	Phenology(ies)				Day(s)			
			D	V	B	F	M	T	W	Th
	Calochortus striatus	Alkali mariposa-lily								
	Castela emoryi	Crucifixion thorn								
	Chamaesyce abramsiana	Abram's spurge								
	Chamaesyce platysperma	Flat-seeded spurge								
	Colubrina californica	Las Animas colubrine								
	Condalia globosa var. pubescens	bitter snakewood								
	Corypantha alversonii	Foxtail cactus								
	Cryptantha costata	ribbed cryptantha								
	Cryptantha holoptera	winged cryptantha								
	Cynanchum utahense	Utah milkvine								
	Ditaxis claryana	glandular ditaxis								
	Ditaxis serrata var. californica	California ditaxis								
	Echinocactus polycephalus var. polycephalus	cottontop cactus								
	Echinocereus engelmannii	hedgehog cactus								
	Echinocereus triglochidiatus	hedgehog cactus								
	Eriastrum harwoodii	Harwood's wollystar								
	Ferocactus cylindraceus	California barrel cactus								
	Horsfordia alata	pink velvet mallow								
	Hymenoxys odorata	bitter hymenoxys								
	Imperata brevifolia	California satintail								
	Matelea parvifolia	spearleaf								
	Mentzelia puberula	Argus blazing star								
	Physalis lobata	lobed ground cherry								
	Portulaca halimoides	desert portulaca								
	Proboscidea althaeifolia	desert unicorn plant								
	Salvia greatae	Orocopia sage								
	Selaginella eremophila	Desert spikemoss								
	Senna covesii	Coves' cassia								
	Teucrium cubense ssp. depressum	dwarf germander								
	Wislizenia refracta ssp. refracta	Jackass clover								
	Xylorhiza orcuttii	Orcutt's Woody-aster								
OTHER SPECIES NEW TO LIST										

Family	Scientific Name	Common Name	Phenology(ies)				Day(s)			
			D	V	B	F	M	T	W	Th

Family	Scientific Name	Common Name	Phenology(ies)				Day(s)			
			D	V	B	F	M	T	W	Th

* Nonnative species

BLYTHE SOLAR POWER PROJECT

SPRING 2010 BOTANICAL SURVEYS

SCAN DETAILS

Surveyor	Singh, Onkar
Scanned By	Harper, Kyle
Scan Date	05.17.2010

Data submitted to AECOM electronically.

Refer to geodatabase and floral inventory.

BLYTHE SOLAR POWER PROJECT

SPRING 2010 BOTANICAL SURVEYS

SCAN DETAILS

Surveyor	Dwerlkotte, Rich
Scanned By	Harper, Kyle
Scan Date	05.17.2010

PALEN 3/22 - 3/24
BLYTHE 3/25

PALEN / BLYTHE Dwer/Kettle 3/22

Family	Scientific Name	Common Name	Phenology(ies)				Day(s)			
			D	V	B	F	M	T	W	Th
	MONOCOTS									
Liliaceae – Lilly Family				✓	X		✓	✓	✓	✓
	Hesperocallis undulata	desert lily								
Poaceae – Grass Family										
	Festuca sp.*	fescue								
	Pleuraphis cf. *rigida*	big galleta grass			X		✓	✓	✓	✓
	Schismus sp.* arabicus	Mediterranean grass			X		✓	✓	✓	✓
	Vulpia octoflora				X			✓		
	DICOTS									
Aizoaceae – Fig-Marigold Family										
	Sesuvium verrucosum	western sea-purslane		X	✓		✓		✓	
Amaranthaceae – Amaranth Family										
	Tidestromia oblongifolia	Arizona honeysweet		X			✓			
Asteraceae – Sunflower Family										
	Ambrosia dumosa	burroweed , white bursage		X	✓		✓	✓	✓	✓
	Atrichoseris platyphylla	parachute plant , gravel ghost								
	Baileya pauciradiata	laxflower		X				✓		
	Baileya pleniradiata	woolly desert marigold								
	Bebbia juncea var. aspera	sweetbush		X				✓		
	Calycoseris wrightii	white tackstem								
	Chaenactis carphoclinia	pebble pincushion								
	Chaenactis stevioides	desert pincushion		X	✓		✓	✓	✓	
	Dicoria canescens	desert twinbugs		X				✓	✓	
	Encelia farinosa	brittlebush, incienso			X			✓		
	Gerea canescens	desert sunflower		X	✓		✓	✓	✓	✓
	Hymenoclea salsola	cheesebush		✓	X			✓	✓	
	Isocoma cf. *acradenia*	alkali goldenbush								
	Malacothrix ~~californica~~ glabrata	California desert dandelion		X	✓		✓	✓	✓	
	Monoptilon bellioides	Mojave desertstar			✓			✓	✓	
	Palafoxia arida	Spanish needle, desert palafox		X	✓		✓	✓	✓	
	Perityle emoryi	Emory's rockdaisy								
	Psathyrotes ramosissima	velvet turtleback								

PALEN Dwerlkotte

Family	Scientific Name	Common Name	Phenology(ies)				Day(s)			
			D	V	B	F	M	T	W	Th
	Stephanomeria pauciflora var. *pauciflora*	wire lettuce								
	Trichoptilium incisum	yellowhead, yellowdome								
Boraginaceae – Borage Family										
	Amsinckia menziesii var. *menziesii*	rancher's fireweed								
	Cryptantha sp. marubma	PLEASE COLLECT			X	✓			✓	
	Cryptantha angustifolia	narrow leaved cryptantha			✓	X	✓	✓		
	Cryptantha barbigera	bearded cryptantha						✓	✓	✓
	Cryptantha costata	ribbed cryptantha		✓	X	✓	✓	✓	✓	✓
	Pectocarya ~~peninsularis~~	peninsular pectocarya			✓	X	✓	✓	✓	✓
	Pectocarya platycarpa	broadfruit combseed			✓	X	✓	✓	✓	✓
	Tiquilia plicata	fanleaf crinklemat, plicate coldenia								
	→ P. heterocarpha									
	Cryptantha nevadensis			✓	X			✓	✓	
Brassicaceae – Mustard Family										
	*Brassica tournefortii**	Saharan mustard, Sahara mustard		✓	X	X	✓	✓	✓	✓
	Dithyrea californica	spectacle-pod			✓	X	✓	✓	✓	
	Lepidium sp. dictyota	pepperweed				X		✓	✓	
Cactaceae – Cactus Family										
	Opuntia bigelovii(*Cylindropuntia b.*)	teddybear cholla								
	Opuntia echinocarpa (*Cylindropuntia e.*)	silver cholla, golden cholla		X					✓	
	Opuntia ramosissima (*Cylindropuntia r.*)	pencil cactus, diamond cholla								
	Mammilaria tetrancistra	common fishhook cactus								

PALEN Dwerlkotte

Family	Scientific Name	Common Name	Phenology(ies)				Day(s)			
			D	V	B	F	M	T	W	Th
Campanulaceae – Bellflower Family										
	Nemacladus glanduliferus var. *glanduliferus*	glandular threadplant								
Caryophyllaceae – Pink Family										
	Achyronychia cooperi	onyxflower		X	✓		✓	✓	✓	✓
	Spergularia sp.	sand spurry								
Chenopodiaceae – Goosefoot Family										
	Atriplex canescens	fourwing saltbush		X				✓	✓	
	Atriplex polycarpa	allscale saltbush		X			✓	✓		
	Atriplex sp. See A. Sanders	saltbush				X	✓			
	Chenopodium sp.	goosefoot								
	*Salsola tragus**	Russian thistle, tumbleweed		X	✓		✓	✓	✓	✓
	Suaeda moquinii	bush seepweed		X			✓		✓	
Cucurbitaceae – Gourd Family										
	Brandegea bigelovii	desert starvine								
Cuscutaceae – Dodder Family										
	Cuscuta sp.	dodder								
Euphorbiaceae – Spurge Family										
	Chamaesyce polycarpa	smallseed sandmat		✓	X			✓	✓	
	Chamaesyce setiloba	Yuma sandmat								
	Croton californicus	California croton								
	Ditaxis lanceolata	Narrowleaf ditaxis, narrowleaf silverbush								
	Stillingia spinulosa	annual toothleaf		✓	X				✓	
Fabaceae – Legume Family										
	Acacia greggii	catclaw								
	Astragalus aridus	annual desert milkvetch		✓	X	✓	✓	✓	✓	
	Astragalus didymocarpus	two seeded milkvetch		X			✓	✓		
	Cercidium floridium ssp.	blue palo verde		X			✓	✓	✓	

PALEN Dwerlkotte

Family	Scientific Name	Common Name	Phenology(ies)				Day(s)			
			D	V	B	F	M	T	W	Th
	floridium									
	Lupinus arizonicus	Arizona lupine			X			✓		
	Olneya tesota	ironwood		X			✓	✓	✓	
	Prosopsis glandulosa var. *torreyana*	mesquite, honey mesquite		X				✓	✓	
	Psorothamnus emoryi	dye bush		X				✓	✓	
	Psorothamnus schottii	Schott's dalea								
	Psorothamnus spinosus	smoketree								
	Astragalus insularis harwoodii			✓	X	✓	✓		✓	
	Dalea mollissima									
	↳ see Tammie's notes									
	Lupinus concinnus			✓	X			✓		
	Lotus			✓	✓	✓	✓		✓	
Fouquieriaceae – Ocotillo Family										
	Fouquieria splendens ssp. *splendens*	ocotillo								
Hydrophyllaceae – Waterleaf Family										
	Phacelia crenulata ssp. *ambigua*	purplestem phacelia			X			✓	✓	
	Phacelia distans	distant phacelia, common phacelia			X			✓		
	Phacelia crenulata									
	ssp minutiflora				X			✓		
	n									
Lamiaceae – Mint Family										
	Hyptis emoryi	desert lavender			X			✓		
	Salvia columbariae	chia								
Loasaceae – Loasa Family										
	Mentzelia cf. *affinis*	yellowcomet								
	Mentzelia involucrata	whitebract blazingstar								
Malvaceae – Mallow Family										
	Eremalche exilis	white mallow		✓	X				✓	
	Eremalche rotundifolia	desert five-spot		X					✓	
Nyctaginaceae – Four O'Clock										
	Abronia villosa var. *villosa*	desert sand verbena		✓	X		✓	✓	✓	

PALEN Dwerlkotte

Family	Scientific Name	Common Name	Phenology(ies)				Day(s)			
			D	V	B	F	M	T	W	Th
	Allionia incarnata	trailing allionia, windmills								
Onagraceae – Primrose Family										
	Camissonia boothii ssp. *condensata*	desert suncup		X	✓				✓	
	Camissonia boothii ssp. *desertorum*	desert suncup								
	Camissonia claviformis ssp. *aurantiaca*	browneyes								
	Camissonia sp. claviformis	suncup		X	✓		✓		✓	
	Oenothera deltoides	birdcage evening primrose, devil's lantern		✓	X		✓	✓	✓	
Orobanchaceae -- Broom-rape Family										
	Orobanche cooperi	desert broomrape, Cooper's broom rape								
Papavaraceae – Poppy Family										
	Eschscholzia glyptosperma	desert poppy , desert golden poppy								
	Eschscholzia minutiflora	pygmy poppy, Coville's poppy			X		✓	✓	✓	
	Eschscholzia parishii	Parish's poppy, Pygmy Poppy								
Plantaginaceae – Plantain Family										
	Plantago ovata	desert Indian wheat			✓	X	✓	✓	✓	✓
	Plantago sp.	plantain								
Polemoniaceae – Phlox Family										
	Linanthus jonesii	Jones' linanthus			X		✓	✓		
	Loeseliastrum schottii	Schott's calico	X	✓				✓	✓	
Polygonaceae – Buckwheat Family										

PALEN Dunerkotte

Family	Scientific Name	Common Name	Phenology(ies)				Day(s)			
			D	V	B	F	M	T	W	Th
	Chorizanthe brevicornu var. *brevicornu*	brittle spineflower		X			✓		✓	
	Chorizanthe corrugata	wrinkled spineflower		X				✓		
	Chorizanthe rigida	spiny herb, devil's spineflower		X				✓		
	Eriogonum inflatum	desert trumpet								
	Eriogonum thomasii	Thomas Eriogonum		X				✓		
Resedaceae – Mignonette Family										
	Oligomeris linifolia	lineleaf whitepuff			X				✓	
Simaroubaceae – Quassia Family										
	Castela emoryi	Crucifixion thorn								
Solanaceae – Nightshade Family										
	Datura discolor	Jimson weed	X					✓		
	Lycium andersonii	water jacket, Anderson's desert thorn								
	Nicotiana obtusifolia	desert tobacco								
Tamaraceae – Tamarisk Family										
	*Tamarix aphylla**	athel tree								
Zygophyllaceae – Caltrop Family										
	Fagonia laevis	California fagonbush								
	Larrea tridentata	creosote bush			X	✓	✓	✓	✓	✓
RARE PLANT TARGET LIST										
	Acleisanthes longiflora	Angel trumpets								
	Androstephium breviflorum	small-flowered androstephium								
	Astragalus insularis var. harwoodii	Harwood's milkvetch								
	Astragalus lentiginosus var. coachellae	Coachella Valley milkvetch								
	Ayenia compacta	California ayenia								
	Calliandra eriophylla	Fairyduster								
	Calochortus striatus	Alkali mariposa-lily								

PALEN Dwerk. Hr

Family	Scientific Name	Common Name	Phenology(ies)				Day(s)			
			D	V	B	F	M	T	W	Th
	Castela emoryi	Crucifixion thorn								
	Chamaesyce abramsiana	Abram's spurge								
	Chamaesyce platysperma	Flat-seeded spurge								
	Colubrina californica	Las Animas colubrine								
	Condalia globosa var. pubescens	bitter snakewood								
	Corypantha alversonii	Foxtail cactus								
	Cryptantha costata	ribbed cryptantha								
	Cryptantha holoptera	winged cryptantha								
	Cynanchum utahense	Utah milkvine								
	Ditaxis claryana	glandular ditaxis								
	Ditaxis serrata var. californica	California ditaxis								
	Echinocactus polycephalus var. polycephalus	cottontop cactus								
	Echinocereus engelmannii	hedgehog cactus								
	Echinocereus triglochidiatus	hedgehog cactus								
	Eriastrum harwoodii	Harwood's wollystar								
	Ferocactus cylindraceus	California barrel cactus								
	Horsfordia alata	pink velvet mallow								
	Hymenoxys odorata	bitter hymenoxys								
	Imperata brevifolia	California satintail								
	Matelea parvifolia	spearleaf								
	Mentzelia puberula	Argus blazing star								
	Physalis lobata	lobed ground cherry								
	Portulaca halimoides	desert portulaca								
	Proboscidea althaeifolia	desert unicorn plant								
	Salvia greatae	Orocopia sage								
	Selaginella eremophila	Desert spikemoss								
	Senna covesii	Coves' cassia								
	Teucrium cubense ssp. depressum	dwarf germander								
	Wislizenia refracta ssp. refracta	Jackass clover								
	Xylorhiza orcuttii	Orcutt's Woody-aster								
OTHER SPECIES NEW TO LIST										
	Encelia frutescens				X			✓		
	Chaenactis fremontii				X				✓	
	Dalea mollis				X				✓	
	Phorodendron californicum				X				✓	
	Monolepis nuttaliana					X			✓	

BLYTHE SOLAR POWER PROJECT

SPRING 2010 BOTANICAL SURVEYS

SCAN DETAILS

Surveyor	Beyerl, Tammie
Scanned By	Harper, Kyle
Scan Date	05.17.2010

T. Beyerl week of 3/22/10

BLYTHE

INSTRUCTIONS: Please mark the plant species you see, including the day(s) of observation and the phenology(ies) observed. Mark the DOMINANT phenology with an "X", and all other observed phonologies with an "O".

There is additional room for new species at the bottom of each list.

If you observe a species that you are not sure of... please collect it! If you can't collect it because it is not fruiting, etc. or the population is too small, then photograph it! Take it back to the motel and key the darn thing if you can. It is on, or may be on, our rare plant hit list. ☺

Phenology Codes: D = Dead/Dormant, V = Vegetative, B = Blooming, F = Fruiting

Family	Scientific Name	Common Name	Phenology(ies)				Day(s)			
			D	V	B	F	M	T	W	Th
GNETALES										
Ephedraceae – Ephedta Family										
	Ephedra sp.	ephedra								
MONOCOTS										
Agavaceae – Century Plant Family										
	Hesperocallis undulata	desertlily		O	X					✓
Poaceae – Grass Family										
	Aristida adscensionis	sixweeks threeawn								
	Aristida purpurea	purple threeawn								
	Bouteloua barbata var. *barbata*	sixweeks grama								
	Bromus madritensis ssp. *rubens**	red brome, foxtail chess								
	Erioneuron pulchellum (*syn. Dasyochloa pulchella*)	fluff grass								
	Pleuraphis rigida	big galleta grass			X					✓
	*Schismus arabicus**	Mediterranean grass								
	*Vulpia bromoides**	brome fescue								
	Vulpia octoflora	sixweeks fescue			X					✓
DICOTS										
Asclepiadaceae – Milkweed Family										
	Asclepias subulata	rush milkweed								
	Cynanchum utahense	Utah cynanchum								
	Sarcostemma cynanchoides	climbing milkweed								

Family	Scientific Name	Common Name	Phenology(ies)				Day(s)			
			D	V	B	F	M	T	W	Th
	ssp. *hartwegii*									
	Sarcostemma hirtellum	trailing townula, hairy milkweed								
Asteraceae – Sunflower Family										
	Adenophyllum porophylloides	San Felipe dyssodia								
	Ambrosia dumosa	burroweed , white bursage								
	Atrichoseris platyphylla	parachute plant , gravel ghost								
	Bebbia juncea var. *aspera*	sweetbush								
	Calycoseris wrightii	white tackstem		X						✓
	Chaenactis carphoclinia	pebble pincushion								
	Chaenactis stevioides	desert pincushion		O	X					✓
	Encelia farinosa var. farinosa	brittlebush, incienso			X					✓
	Encelia farinosa var. phenicodonta	dark-eyed brittlebush			X					✓
	Encelia frutescens	button brittlebush								
	Geraea canescens	desert-sunflower		O	X					✓
	Hymenoclea salsola	cheesebush								
	Malacothrix glabrata	desert dandelion		O	X					✓
	Monoptilon bellioides	Mojave desertstar			X					✓
	Palafoxia arida var. *arida*	Spanish needle, desert palafox								
	Perityle emoryi	Emory's rockdaisy								
	Pectis papposa	chinchweed								
	Porophyllum gracile	odora								
	Prenanthella exigua	brightwhite								
	Rafinesquia neomexicana	desert chicory			X					✓
	Senecio mohavensis	Mojave ragwort, Mohave Groundsel								
	Stephanomeria exigua	small wire lettuce								
	Stephanomeria pauciflora var. *pauciflora*	wire lettuce								
	Trichoptilium incisum	yellowhead, yellowdome								
	Trixis californica var. *californica*	American threefold								
Boraginaceae – Borage Family										
	Amsinckia menziesii var. *menziesii*	rancher's fireweed			X					✓
	Amsinckia tessellata	fiddleneck								

Family	Scientific Name	Common Name	Phenology(ies)				Day(s)			
			D	V	B	F	M	T	W	Th
	Cryptantha angustifolia	narrow leaved cryptantha			X	O				✓
	Cryptantha barbigera	bearded cryptantha			X					✓
	Cryptantha costata	ribbed cryptantha								
	Cryptantha holoptera	winged cyptantha								
	Cryptantha maritima var. maritima	Guadalupe cryptantha								
	Cryptantha maritima var. pilosa	Guadalupe cryptantha								
	Cyptantha nevadensis var. nevadensis	Nevada catseye			X					✓
	Cryptantha pterocarya var. cycloptera	wingnut cryptantha			X	O				✓
	Pectocarya penicillata	chuckwalla combseed			X	X				✓
	Pectocarya platycarpa	broadfruit combseed			X	X				✓
	Pectocarya recurvata	curvenut combseed, combur								
	Plagiobothrys jonesii	Mojave popcornflower			X					✓
	Tiquilia palmeri	Palmer's coldenia								
	Tiquilia plicata	fanleaf crinklemat, plicate coldenia								
	Cryptantha maritima				X	O				✓
	Cryptantha macrqnata				X	O				✓
Brassicaceae – Mustard Family										
	*Brassica tournefortii**	Saharan mustard, Sahara mustard			X	O				✓
	Dithyrea californica	spectacle-pod								
	Guillenia lasiophyllum	California mustard			O	X				✓
	Lepidium lasiocarpum	pepperweed			O	X				✓
	*Sisymbrium irio**	London rocket								
	Tropidocarpum gracile	dobie pod								
Cactaceae – Cactus Family										
	Echinocactus polycephalus var. *polycephalus*	cottontop cactus, clustered barrel cactus								
	Ferocactus cylindraceus var. *cylindraceus*	California barrel cactus								

Family	Scientific Name	Common Name	Phenology(ies)				Day(s)			
			D	V	B	F	M	T	W	Th
	Mammillaria tetrancistra	common fishhook cactus								
	Opuntia basilaris	beavertail cactus								
	Opuntia echinocarpa (*Cylindropuntia e.*)	silver cholla, golden cholla		X						✓
	Opuntia ramosissima (*Cylindropuntia r.*)	pencil cactus, diamond cholla								
	Nemacladus	threadplant								
Chenopodiaceae – Goosefoot Family										
	Atriplex polycarpa	allscale saltbrush								
	Atriplex hymenelytra	desert holly								
	Chenopodium murale	nettleleaf goosefoot								
	Chenopodium sp.	goosefoot								
	*Salsola tragus**	Russian thistle, tumbleweed								
Cucurbitaceae – Gourd Family										
	Brandegea bigelovii	desert starvine								
Euphorbiaceae – Spurge Family										
	Chamaesyce polycarpa	smallseed sandmat			X	O				✓
	Ditaxis lanceolata	Narrowleaf ditaxis, narrowleaf silverbush								
	Ditaxis neomexicana	New Mexico ditaxis								
	Euphorbia eriantha	beetle spurge								
Fabaceae – Legume Family										
	Acacia gregii	catclaw		X						✓
	Astragalus nuttallianus var. *imperfectus*	turkey peas			X	O				✓
	Astragalus insularis var. *harwoodii*	Harwood's milkvetch								
	Cercidium floridium ssp. *floridium*	blue palo verde		X						✓
	Dalea mollis	silky dalea, hairy prairie clover		X	O					✓

Family	Scientific Name	Common Name	Phenology(ies)				Day(s)			
			D	V	B	F	M	T	W	Th
	Dalea mollissima	hairy dalea, downy dalea								
	Lotus strigosus var. tomentellus	strigose bird's-foot trefoil		O	X					✓
	Lotus wrangelianus	Chilean bird's-foot trefoil								
	Lupinus cf. *arizonicus*	Arizona lupine								
	Marina parryi	Parry's false prairie clover	X	O						✓
	Olneya tesota	ironwood								
	Prosopis glandulosa	honey mesquite								
	Psorothamnus spinosum	smoke tree								
	Senna armata	spiny senna, desert senna								
Fouquieriaceae – Ocotillo Family										
	Fouquieria splendens ssp. *splendens*	ocotillo			X					✓
Geraniaceae – Geranium Family										
	Erodium texanum	Texas storksbill, Desert Heron's Bill			O	X				✓
Hydrophyllaceae – Waterleaf Family										
	Eucrypta micrantha	dainty desert hideseed								
	Nama demissum var. *demissum*	purplemat			X					✓
	Phacelia crenulata var. *ambigua*	purplestem phacelia			X					✓
	Phacelia crenulata var. *minutiflora*	cleftleaf wildheliotrope								
	Phacelia neglecta	alkali phacelia								
	Phacelia cf rotundifolia			O	X					✓
Krameriaceae – Rhatany Family										
	Krameria erecta	Pima rharany, littleleaf ratany								
	Krameria grayi	white rhatany		X						✓

Family	Scientific Name	Common Name	Phenology(ies)				Day(s)			
			D	V	B	F	M	T	W	Th
Lamiaceae – Mint Family										
	Hyptis emoryi	desert-lavender								
Loasaceae – Loasa Family										
	Mentzelia cf. *albicaulis*	small flowered blazing star, white stemmed stickleaf			O	X				✓
	Mentzelia involucrata	whitebract blazingstar								
Malvaceae – Mallow Family										
	Eremalche rotundifolia	desert five-spot		X						✓
	Hibiscus denudatus	paleface								
	Sphaeralcea ambigua	desert globemallow , apricot mallow								
	Eremalche exilis			X						✓
Martyniaceae – Unicorn-Plant Family										
	Proboscidea althaeifolia	desert unicorn-plant		X						✓
Nyctaginaceae – Four O'Clock Family										
	Abronia villosa var. *villosa*	desert sand verbena								
	Allionia incarnata	trailing allionia, windmills								
	Boerhavia	spiderling								
	Mirabilis bigelovii	wishbone bush								
Onagraceae – Evening Primrose Family										
	Camissonia boothii ssp. *desertorum*	desert suncup	O		X					✓
	Camissonia brevipes ssp. *brevipes*	golden suncup								
	Camissonia cf. *cardiophylla*	heartleaf suncup								
	Camissonia claviformis	browneyes			X					✓
	Camissonia refracta	narrowleaf suncup								

Family	Scientific Name	Common Name	Phenology(ies)				Day(s)			
			D	V	B	F	M	T	W	Th
Papaveraceae – Poppy Family										
	Eschscholzia glyptosperma	desert poppy , desert golden poppy								
	Eschscholzia minutiflora	pygmy poppy, Coville's poppy			X					✓
Plantaginaceae – Plantain Family										
	Plantago ovata	desert Indianwheat, woolly plantain			X					✓
Polemoniaceae – Phlox Family										
	Gilia brecciarum ssp. *brecciarum*	Nevada gilia								
	Gilia latifolia	broadleaf gilia								
	Gilia stellata	star gilia								
	Langloisia setosissima ssp. *setosissima*	bristly langloisia		X	O					✓
	Linanthus jonesii	Jones' linanthus								
	Loeseliastrum schottii	Schott's calico								
Polygonaceae – Buckwheat Family										
	Chorizanthe brevicornu var. *brevicornu*	brittle spineflower			X					✓
	Chorizanthe corrugata	wrinkled spineflower			X					✓
	Chorizanthe rigida	spiny-herb			X					✓
	Eriogonum inflatum var. *inflatum*	desert trumpet								
	Eriogonum reniforme	kidneyleaf buckwheat								
	Eriogonum thomasii	Thomas Eriogonum		X	O					✓
	Eriogonum trichopes	little deserttrumpet								

Family	Scientific Name	Common Name	Phenology(ies)				Day(s)			
			D	V	B	F	M	T	W	Th
Resedaceae – Mignonette Family										
	Oligomeris linifolia	lineleaf whitepuff			X					✓
Rhamnaceae – Buckthorn Family										
	Colubrina californica	las animas colubrina								
	Ziziphus cf. *obtusifolia* var. *canescens*	graythorn								
Scrophulariaceae – Figwort Family										
	Antirrhinum filipes	twining snapdragon								
	Mohavea confertiflora	ghost flower								
Solanaceae – Nightshade Family										
	Lycium andersonii	water jacket, Anderson's desert thorn			X					✓
	Physalis hederifolia var. *fendleri*	Fendler's groundcherry								
Tamaricaceae – Tamarisk Family										
	Tamarix sp. *	Tamarisk								
Viscaceae – Mistletoe Family										
	Phoradendron californicum	desert mistletoe								
Zygophyllaceae – Caltrop Family										
	Fagonia laevis	California fagonbush								
	Larrea tridentata	creosote bush			X	D				✓
	Kallstroemia parviflora	warty caltrop								
RARE PLANT TARGET LIST										
	Acleisanthes longiflora	Angel trumpets								
	Androstephium breviflorum	small-flowered androstephium								
	Astragalus insularis var. harwoodii	Harwood's milkvetch								
	Astragalus lentiginosus var. coachellae	Coachella Valley milkvetch								
	Ayenia compacta	California ayenia								
	Calliandra eriophylla	Fairyduster								

Family	Scientific Name	Common Name	Phenology(ies)				Day(s)			
			D	V	B	F	M	T	W	Th
	Calochortus striatus	Alkali mariposa-lily								
	Castela emoryi	Crucifixion thorn								
	Chamaesyce abramsiana	Abram's spurge								
	Chamaesyce platysperma	Flat-seeded spurge								
	Colubrina californica	Las Animas colubrine								
	Condalia globosa var. pubescens	bitter snakewood								
	Corypantha alversonii	Foxtail cactus								
	Cryptantha costata	ribbed cryptantha								
	Cryptantha holoptera	winged cryptantha								
	Cynanchum utahense	Utah milkvine								
	Ditaxis claryana	glandular ditaxis								
	Ditaxis serrata var. californica	California ditaxis								
	Echinocactus polycephalus var. polycephalus	cottontop cactus								
	Echinocereus engelmannii	hedgehog cactus								
	Echinocereus triglochidiatus	hedgehog cactus								
	Eriastrum harwoodii	Harwood's wollystar								
	Ferocactus cylindraceus	California barrel cactus								
	Horsfordia alata	pink velvet mallow								
	Hymenoxys odorata	bitter hymenoxys								
	Imperata brevifolia	California satintail								
	Matelea parvifolia	spearleaf								
	Mentzelia puberula	Argus blazing star								
	Physalis lobata	lobed ground cherry								
	Portulaca halimoides	desert portulaca								
	Proboscidea althaeifolia	desert unicorn plant								
	Salvia greatae	Orocopia sage								
	Selaginella eremophila	Desert spikemoss								
	Senna covesii	Coves' cassia								
	Teucrium cubense ssp. depressum	dwarf germander								
	Wislizenia refracta ssp. refracta	Jackass clover								
	Xylorhiza orcuttii	Orcutt's Woody-aster								
OTHER SPECIES NEW TO LIST										

Family	Scientific Name	Common Name	Phenology(ies)				Day(s)			
			D	V	B	F	M	T	W	Th

Family	Scientific Name	Common Name	Phenology(ies)				Day(s)			
			D	V	B	F	M	T	W	Th

* Nonnative species

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Family	Scientific Name	Common Name	Phenology(ies)				Day(s)			
			D	V	B	F	M	T	W	Th
GNETALES										
Ephedraceae – Ephedta Family										
	Ephedra sp.	ephedra								
MONOCOTS										
Poaceae – Grass Family										
	Aristida adscensionis	sixweeks threeawn								
	Aristida purpurea	purple threeawn								
	Bouteloua barbata var. *barbata*	sixweeks grama								
	Bromus madritensis ssp. *rubens**	red brome, foxtail chess								
	Erioneuron pulchellum (*syn. Dasyochloa pulchella*)	fluff grass								
	Pleuraphis rigida	big galleta grass		✓	✓		✓	✓		
	Schismus sp.*	Mediterranean grass		✓	✓		✓	✓		
	*Vulpia bromoides**	brome fescue								
	Vulpia octoflora	sixweeks fescue								
DICOTS										
Asclepiadaceae – Milkweed Family					✓		✓			
	Asclepias subulata	rush milkweed								
	Cynanchum utahense	Utah cynanchum								
	Sarcostemma cynanchoides ssp. *hartwegii*	climbing milkweed								
	Sarcostemma hirtellum	trailing townula, hairy milkweed								
Asteraceae – Sunflower Family										
	Adenophyllum porophylloides	San Felipe dyssodia								
	Ambrosia dumosa	burroweed , white bursage		✓			✓	✓		
	Atrichoseris platyphylla	parachute plant , gravel ghost								
	Bebbia juncea var. *aspera*	sweetbush		✓	✓		✓			
	Calycoseris wrightii	white tackstem								
	Chaenactis carphoclinia	pebble pincushion								
	Chaenactis stevioides	desert pincushion			✓		✓			
	Encelia farinosa	brittlebush, incienso			✓		✓			
	Encelia frutescens	button brittlebush								
	Geraea canescens	desert-sunflower								
	Hymenoclea salsola	cheesebush								
	Malacothrix glabrata	desert dandelion								
	Monoptilon bellioides	Mojave desertstar								
	Palafoxia arida var. *arida*	Spanish needle, desert palafox		✓	✓		✓	✓		
	Perityle emoryi	Emory's rockdaisy								
	Pectis papposa	chinchweed								
	Porophyllum gracile	odora								
	Prenanthella exigua	brightwhite								
	Rafinesquia neomexicana	desert chicory		✓	✓		✓	✓		
	Senecio mohavensis	Mojave ragwort, Mohave Groundsel								
	Stephanomeria pauciflora var. *pauciflora*	wire lettuce								

Family	Scientific Name	Common Name	Phenology(ies)				Day(s)			
			D	V	B	F	M	T	W	Th
	Trichoptilium incisum	yellowhead, yellowdome								
	Trixis californica var. *californica*	American threefold								
Boraginaceae – Borage Family										
	Amsinckia menziesii var. *menziesii*	rancher's fireweed								
	Cryptantha angustifolia	narrow leaved cryptantha			✓		✓	✓		
	Cryptantha barbigera	bearded cryptantha								
	Cryptantha costata	ribbed cryptantha								
	Cryptantha maritima	Guadalupe cryptantha								
	Cryptantha pterocarya	wingnut cryptantha								
	Pectocarya penicillata	chuckwalla combseed								
	Pectocarya platycarpa	broadfruit combseed								
	Tiquilia plicata	fanleaf crinklemat, plicate coldenia								
Brassicaceae – Mustard Family										
	*Brassica tournefortii**	Saharan mustard, Sahara mustard		✓	✓	✓	✓	✓		
	Dithyrea californica	spectacle-pod			✓	✓	✓	✓		
	Guillenia lasiophyllum	California mustard			✓	✓	✓			
	Lepidium sp. dictyotum	pepperweed			✓	✓	✓	✓		
	Tropidocarpum gracile	dobie pod								
Cactaceae – Cactus Family										
	Echinocactus polycephalus var. *polycephalus*	cottontop cactus, clustered barrel cactus								
	Ferocactus cylindraceus var. *cylindraceus*	California barrel cactus								
	Mammillaria tetrancistra	common fishhook cactus								
	Opuntia basilaris	beavertail cactus								
	Opuntia echinocarpa (*Cylindropuntia e.*)	silver cholla, golden cholla								
	Opuntia ramosissima (*Cylindropuntia r.*)	pencil cactus, diamond cholla		✓			✓			
Chenopodiaceae – Goosefoot Family										
	Atriplex polycarpa	allscale saltbrush								
	Atriplex hymenelytra	desert holly								
	Chenopodium murale	nettleleaf goosefoot								
	Chenopodium sp.	goosefoot								
	*Salsola tragus**	Russian thistle, tumbleweed	✓	✓				✓		
Cucurbitaceae – Gourd Family										
	Brandegea bigelovii	desert starvine		✓			✓			
Euphorbiaceae – Spurge Family										
	Chamaesyce polycarpa	smallseed sandmat			✓		✓	✓		
	Ditaxis lanceolata	Narrowleaf ditaxis, narrowleaf silverbush								
	Ditaxis neomexicana	New Mexico ditaxis								
	Euphorbia eriantha	beetle spurge								
Fabaceae – Legume Family										

Family	Scientific Name	Common Name	Phenology(ies)				Day(s)			
			D	V	B	F	M	T	W	Th
	Acacia gregii	catclaw								
	Astragalus nuttallianus var. *imperfectus*	turkey peas								
	Astragalus insularis var. *harwoodii*	Harwood's milkvetch			✓	✓		✓		
	Cercidium floridium ssp. *floridium*	blue palo verde		✓			✓	✓		
	Dalea mollis	silky dalea, hairy prairie clover								
	Lotus wrangelianus	Chilean bird's-foot trefoil		✓	✓	✓	✓	✓		
	Lupinus cf. *arizonicus*	Arizona lupine								
	Marina parryi	Parry's false prairie clover								
	Olneya tesota	ironwood		✓			✓			
	Prosopis glandulosa	honey mesquite		✓			✓			
	Psorothamnus spinosum	smoke tree		✓			✓	✓		
	Senna armata	spiny senna, desert senna								
Fouquieriaceae – Ocotillo Family										
	Fouquieria splendens ssp. *splendens*	ocotillo								
Geraniaceae – Geranium Family										
	Erodium texanum	Texas storksbill, Desert Heron's Bill		✓			✓			
Hydrophyllaceae – Waterleaf Family										
	Eucrypta micrantha	dainty desert hideseed		✓	✓		✓			
	Nama demissum var. *demissum*	purplemat								
	Phacelia crenulata var. *ambigua*	purplestem phacelia			✓		✓			
	Phacelia crenulata var. *minutiflora*	cleftleaf wildheliotrope								
Krameriaceae – Rhatany Family										
	Krameria erecta	Pima rharany, littleleaf ratany								
	Krameria grayi	white rhatany								
Lamiaceae – Mint Family										
	Hyptis emoryi	desert-lavender								
Loasaceae – Loasa Family										
	Mentzelia cf. *albicaulis*	small flowered blazing star, white stemmed stickleaf		✓	✓	✓	✓			
	Mentzelia involucrata	whitebract blazingstar								
Malvaceae – Mallow Family										
	Eremalche rotundifolia	desert five-spot		✓				✓		
	Hibiscus denudatus	paleface								
	Sphaeralcea ambigua	desert globemallow , apricot mallow								
Martyniaceae – Unicorn-Plant Family										
	Proboscidea althaeifolia	desert unicorn-plant	✓				✓			
Nyctaginaceae – Four O'Clock Family										
	Allionia incarnata	trailing allionia, windmills								
Onagraceae – Evening Primrose Family										
	Camissonia boothii ssp. *desertorum*	desert suncup	✓					✓		

Family	Scientific Name	Common Name	Phenology(ies)				Day(s)			
			D	V	B	F	M	T	W	Th
	Camissonia brevipes ssp. *brevipes*	golden suncup								
	Camissonia cf. *cardiophylla*	heartleaf suncup								
	Camissonia claviformis	browneyes			✓		✓	✓		
	Camissonia refracta	narrowleaf suncup								
Papaveraceae – Poppy Family										
	Eschscholzia glyptosperma	desert poppy , desert golden poppy								
	Eschscholzia minutiflora	pygmy poppy, Coville's poppy		✓	✓		✓	✓		
Plantaginaceae – Plantain Family										
	Plantago ovata	desert Indianwheat, woolly plantain		✓	✓		✓	✓		
Polemoniaceae – Phlox Family										
	Gilia brecciarum ssp. *brecciarum*	Nevada gilia								
	Gilia latifolia	broadleaf gilia								
	Gilia stellata	star gilia								
	Langloisia setosissima ssp. *setosissima*	bristly langloisia								
	Linanthus jonesii	Jones' linanthus		✓	✓		✓			
	Loeseliastrum schottii	Schott's calico								
Polygonaceae – Buckwheat Family										
	Chorizanthe brevicornu var. *brevicornu*	brittle spineflower								
	Chorizanthe corrugata	wrinkled spineflower								
	Chorizanthe rigida	spiny-herb								
	Eriogonum inflatum	desert trumpet								
	Eriogonum reniforme	kidneyleaf buckwheat								
	Eriogonum thomasii	Thomas Eriogonum		✓	✓		✓			
	Eriogonum trichopes	little deserttrumpet								
Resedaceae – Mignonette Family										
	Oligomeris linifolia	lineleaf whitepuff								
Rhamnaceae – Buckthorn Family										
	Colubrina californica	las animas colubrina								
	Ziziphus cf. *obtusifolia* var. *canescens*	graythorn								
Scrophulariaceae – Figwort Family										
	Antirrhinum filipes	twining snapdragon								
	Mohavea confertiflora	ghost flower								
Solanaceae – Nightshade Family										
	Lycium andersonii	water jacket, Anderson's desert thorn			✓		✓			
	Physalis hederifolia var. *fendleri*	Fendler's groundcherry								
Tamaricaceae – Tamarisk Family										
	Tamarx sp. *	Tamarisk								
Viscaceae – Mistletoe Family										
	Phoradendron californicum	desert mistletoe								

Family	Scientific Name	Common Name	Phenology(ies)				Day(s)			
			D	V	B	F	M	T	W	Th
Zygophyllaceae – Caltrop Family										
	Fagonia laevis	California fagonbush								
	Larrea tridentata	creosote bush			✓		✓	✓		
	Kallstroemia parviflora	warty caltrop								
RARE PLANT TARGET LIST										
	Acleisanthes longiflora	Angel trumpets								
	Androstephium breviflorum	small-flowered androstephium								
	Astragalus insularis var. harwoodii	Harwood's milkvetch			✓	✓		✓		
	Astragalus lentiginosus var. coachellae	Coachella Valley milkvetch								
	Ayenia compacta	California ayenia								
	Calliandra eriophylla	Fairyduster								
	Calochortus striatus	Alkali mariposa-lily								
	Castela emoryi	Crucifixion thorn								
	Chamaesyce abramsiana	Abram's spurge								
	Chamaesyce platysperma	Flat-seeded spurge								
	Colubrina californica	Las Animas colubrine								
	Condalia globosa var. pubescens	bitter snakewood								
	Corypantha alversonii	Foxtail cactus								
	Cryptantha costata	ribbed cryptantha			✓	✓		✓		
	Cryptantha holoptera	winged cryptantha								
	Cynanchum utahense	Utah milkvine								
	Ditaxis claryana	glandular ditaxis								
	Ditaxis serrata var. californica	California ditaxis								
	Echinocactus polycephalus var. polycephalus	cottontop cactus								
	Echinocereus engelmannii	hedgehog cactus								
	Echinocereus triglochidiatus	hedgehog cactus								
	Eriastrum harwoodii	Harwood's wollystar								
	Ferocactus cylindraceus	California barrel cactus								
	Horsfordia alata	pink velvet mallow								
	Hymenoxys odorata	bitter hymenoxys								
	Imperata brevifolia	California satintail								
	Matelea parvifolia	spearleaf								
	Mentzelia puberula	Argus blazing star								
	Physalis lobata	lobed ground cherry								
	Portulaca halimoides	desert portulaca								
	Proboscidea althaeifolia	desert unicorn plant								
	Salvia greatae	Orocopia sage								
	Selaginella eremophila	Desert spikemoss								
	Senna covesii	Coves' cassia								
	Teucrium cubense ssp. depressum	dwarf germander								
	Wislizenia refracta ssp. refracta	Jackass clover								
	Xylorhiza orcuttii	Orcutt's Woody-aster								
OTHER SPECIES NEW TO LIST										
	Astragalus aridus			✓	✓	✓		✓		

Family	Scientific Name	Common Name	Phenology(ies)				Day(s)			
			D	V	B	F	M	T	W	Th
	Abronia villosa			✓	✓		✓	✓		
	Oenothera deltoides				✓			✓		
	Streptanthella longirostris				✓		✓	✓		
	Cryptantha maritima				✓		✓			
	Cryptantha pterocarya				✓		✓			

* Nonnative species

BLYTHE SOLAR POWER PROJECT

SPRING 2010 BOTANICAL SURVEYS

SCAN DETAILS

Surveyor	St. John, Ted
Scanned By	Harper, Kyle
Scan Date	05.17.2010

MARCH 30. ST. JOHN ✓ SPROUL
MARCH 31 ✓ AMC L - ST. JOHN

BLYTHE

INSTRUCTIONS: Please mark the plant species you see, including the day(s) of observation and the phenology(ies) observed. Mark the DOMINANT phenology with an "X", and all other observed phonologies with an "O".

There is additional room for new species at the bottom of each list.

If you observe a species that you are not sure of... please collect it! If you can't collect it because it is not fruiting, etc. or the population is too small, then photograph it! Take it back to the motel and key the darn thing if you can. It is on, or may be on, our rare plant hit list. ☺

Phenology Codes: D = Dead/Dormant, V = Vegetative, B = Blooming, F = Fruiting

Family	Scientific Name	Common Name	Phenology(ies)				Day(s)			
			D	V	B	F	M	T	W	Th
		GNETALES								
Ephedraceae – Ephedta Family										
	Ephedra sp.	ephedra								
		MONOCOTS								
Agavaceae – Century Plant Family										
	Hesperocallis undulata	desertlily			✓				✓	
Poaceae – Grass Family										
	Aristida adscensionis	sixweeks threeawn								
	Aristida purpurea	purple threeawn								
	Bouteloua barbata var. *barbata*	sixweeks grama								
	Bromus madritensis ssp. *rubens**	red brome, foxtail chess								
	Erioneuron pulchellum (*syn. Dasyochloa pulchella*)	fluff grass			✓			✓	✓	
	Pleuraphis rigida	big galleta grass			✓	✓		✓	✓	
	*Schismus arabicus**	Mediterranean grass								✓
	*Vulpia bromoides**	brome fescue								
	Vulpia octoflora	sixweeks fescue								
		DICOTS								
Asclepiadaceae – Milkweed Family										
	Asclepias subulata	rush milkweed			✓			✓		
	Cynanchum utahense	Utah cynanchum			✓				✓	✓
	Sarcostemma cynanchoides	climbing milkweed								

Family	Scientific Name	Common Name	Phenology(ies)				Day(s)			
			D	V	B	F	M	T	W	Th
	ssp. *hartwegii*									
	Sarcostemma hirtellum	trailing townula, hairy milkweed								
Asteraceae – Sunflower Family										
	Adenophyllum porophylloides	San Felipe dyssodia								
	Ambrosia dumosa	burroweed , white bursage			✓			✓	✓	✓
	Atrichoseris platyphylla	parachute plant , gravel ghost			✓			✓		
	Bebbia juncea var. *aspera*	sweetbush			✓				✓	
	Calycoseris wrightii	white tackstem							✓	
	Chaenactis carphoclinia	pebble pincushion								
	Chaenactis stevioides	desert pincushion			✓			✓	✓	✓
	Encelia farinosa var. farinosa	brittlebush, incienso						✓	✓	✓
	Encelia farinosa var. phenicodonta	dark-eyed brittlebush			✓			✓	✓	✓
	Encelia frutescens	button brittlebush								
	Geraea canescens	desert-sunflower			✓			✓	✓	✓
	Hymenoclea salsola	cheesebush			✓			✓	✓	
	Malacothrix glabrata	desert dandelion			✓			✓	✓	
	Monoptilon bellioides	Mojave desertstar			✓			✓	✓	✓
	Palafoxia arida var. *arida*	Spanish needle, desert palafox								
	Perityle emoryi	Emory's rockdaisy								
	Pectis papposa	chinchweed								
	Porophyllum gracile	odora			✓			✓		
	Prenanthella exigua	brightwhite			✓			✓		
	Rafinesquia neomexicana	desert chicory			✓			✓	✓	✓
	Senecio mohavensis	Mojave ragwort, Mohave Groundsel			✓			✓		
	Stephanomeria exigua	small wire lettuce								
	Stephanomeria pauciflora var. *pauciflora*	wire lettuce		✓						✓
	Trichoptilium incisum	yellowhead, yellowdome								
	Trixis californica var. *californica*	American threefold								
Boraginaceae – Borage Family										
	Amsinckia menziesii var. *menziesii*	rancher's fireweed			✓					✓
	Amsinckia tessellata	fiddleneck								

Family	Scientific Name	Common Name	Phenology(ies)				Day(s)			
			D	V	B	F	M	T	W	Th
	Cryptantha angustifolia	narrow leaved cryptantha			✓			✓	✓	✓
	Cryptantha barbigera	bearded cryptantha								
	Cryptantha costata	ribbed cryptantha								
	Cryptantha holoptera	winged cyptantha								
	Cryptantha maritima var. maritima	Guadalupe cryptantha								
	Cryptantha maritima var. pilosa	Guadalupe cryptantha								
	Cyptantha nevadensis var. nevadensis	Nevada catseye			✓	✓		✓		
	Cryptantha pterocarya var. cycloptera	wingnut cryptantha			✓	✓		✓	✓	
	Pectocarya penicillata	chuckwalla combseed								
	Pectocarya platycarpa	broadfruit combseed			✓	✓		✓	✓	
	Pectocarya recurvata	curvenut combseed, combur								
	Plagiobothrys jonesii	Mojave popcornflower			✓			✓		
	Tiquilia palmeri	Palmer's coldenia								
	Tiquilia plicata	fanleaf crinklemat, plicate coldenia								
	T. CONESCENS ?				✓			✓		
Brassicaceae – Mustard Family										
	*Brassica tournefortii**	Saharan mustard, Sahara mustard			✓			✓	✓	✓
	Dithyrea californica	spectacle-pod								
	Guillenia lasiophyllum	California mustard								
	Lepidium lasiocarpum	pepperweed			✓	✓		✓	✓	✓
	*Sisymbrium irio**	London rocket								
	Tropidocarpum gracile	dobie pod								
Cactaceae – Cactus Family										
	Echinocactus polycephalus var. *polycephalus*	cottontop cactus, clustered barrel cactus								
	Ferocactus cylindraceus var. *cylindraceus*	California barrel cactus								

Family	Scientific Name	Common Name	Phenology(ies)				Day(s)			
			D	V	B	F	M	T	W	Th
	Mammillaria tetrancistra	common fishhook cactus								
	Opuntia basilaris	beavertail cactus								
	Opuntia echinocarpa (*Cylindropuntia e.*)	silver cholla, golden cholla			✓			✓	✓	✓
	Opuntia ramosissima (*Cylindropuntia r.*)	pencil cactus, diamond cholla								
	Nemacladus	threadplant								
Chenopodiaceae – Goosefoot Family										
	Atriplex polycarpa	allscale saltbrush								
	Atriplex hymenelytra	desert holly								
	Chenopodium murale	nettleleaf goosefoot								
	Chenopodium sp.	goosefoot								
	*Salsola tragus**	Russian thistle, tumbleweed								
Cucurbitaceae – Gourd Family										
	Brandegea bigelovii	desert starvine			✓				✓	
Euphorbiaceae – Spurge Family										
	Chamaesyce polycarpa	smallseed sandmat			✓			✓	✓	✓
	Ditaxis lanceolata	Narrowleaf ditaxis, narrowleaf silverbush								
	Ditaxis neomexicana	New Mexico ditaxis								✓
	Euphorbia eriantha	beetle spurge								
Fabaceae – Legume Family										
	Acacia gregii	catclaw			✓			✓	✓	✓
	Astragalus nuttallianus var. *imperfectus*	turkey peas								
	Astragalus insularis var. *harwoodii*	Harwood's milkvetch								
	Cercidium floridium ssp. *floridium*	blue palo verde			✓			✓	✓	
	Dalea mollis	silky dalea, hairy prairie clover			✓				✓	

Family	Scientific Name	Common Name	Phenology(ies)				Day(s)			
			D	V	B	F	M	T	W	Th
	Dalea mollissima	hairy dalea, downy dalea								
	Lotus strigosus var. tomentellus	strigose bird's-foot trefoil			✓			✓	✓	
	Lotus wrangelianus	Chilean bird's-foot trefoil								
	Lupinus cf. *arizonicus*	Arizona lupine			✓			✓	✓	
	Marina parryi	Parry's false prairie clover								✓
	Olneya tesota	ironwood		✓				✓	✓	
	Prosopis glandulosa	honey mesquite								
	Psorothamnus spinosum	smoke tree								
	Senna armata	spiny senna, desert senna								
Fouquieriaceae – Ocotillo Family										
	Fouquieria splendens ssp. *splendens*	ocotillo								
Geraniaceae – Geranium Family										
	Erodium texanum	Texas storksbill, Desert Heron's Bill			✓	✓		✓	✓	
Hydrophyllaceae – Waterleaf Family										
	Eucrypta micrantha	dainty desert hideseed								
	Nama demissum var. *demissum*	purplemat			✓			✓	✓	✓
	Phacelia crenulata var. *ambigua*	purplestem phacelia								
	Phacelia crenulata var. *minutiflora*	cleftleaf wildheliotrope			✓			✓	✓	✓
	Phacelia neglecta	alkali phacelia								
Krameriaceae – Rhatany Family										
	Krameria erecta	Pima rharany, littleleaf ratany								
	Krameria grayi	white rhatany			✓	✓		✓	✓	✓

Family	Scientific Name	Common Name	Phenology(ies)				Day(s)			
			D	V	B	F	M	T	W	Th
Lamiaceae – Mint Family										
	Hyptis emoryi	desert-lavender				✓				✓
Loasaceae – Loasa Family										
	Mentzelia cf. *albicaulis*	small flowered blazing star, white stemmed stickleaf								
	Mentzelia involucrata	whitebract blazingstar			✓			✓	✓	✓
Malvaceae – Mallow Family										
	Eremalche rotundifolia	desert five-spot			✓			✓	✓	
	Hibiscus denudatus	paleface								
	Sphaeralcea ambigua	desert globemallow , apricot mallow								
Martyniaceae – Unicorn-Plant Family										
	Proboscidea althaeifolia	desert unicorn-plant								
Nyctaginaceae – Four O'Clock Family										
	Abronia villosa var. *villosa*	desert sand verbena			✓			✓	✓	✓
	Allionia incarnata	trailing allionia, windmills								
	Boerhavia	spiderling								
	Mirabilis bigelovii	wishbone bush		✓						✓
Onagraceae – Evening Primrose Family										
	Camissonia boothii ssp. *desertorum*	desert suncup			✓			✓	✓	
	Camissonia brevipes ssp. *brevipes*	golden suncup								
	Camissonia cf. *cardiophylla*	heartleaf suncup								
	Camissonia claviformis	browneyes			✓			✓	✓	✓
	Camissonia refracta	narrowleaf suncup								
	OENOTHERA PRIMAVERA				✓				✓	

Family	Scientific Name	Common Name	Phenology(ies)				Day(s)			
			D	V	B	F	M	T	W	Th
Resedaceae – Mignonette Family										
	Oligomeris linifolia	lineleaf whitepuff								
Rhamnaceae – Buckthorn Family										
	Colubrina californica	las animas colubrina								
	Ziziphus cf. *obtusifolia* var. *canescens*	graythorn								
Scrophulariaceae – Figwort Family										
	Antirrhinum filipes	twining snapdragon								
	Mohavea confertiflora	ghost flower			✓			✓	✓	
Solanaceae – Nightshade Family										
	Lycium andersonii	water jacket, Anderson's desert thorn			•	✓		✓	✓	✓
	Physalis hederifolia var. *fendleri*	Fendler's groundcherry								
Tamaricaceae – Tamarisk Family										
	Tamarix sp. *	Tamarisk								
Viscaceae – Mistletoe Family										
	Phoradendron californicum	desert mistletoe		✓					✓	
Zygophyllaceae – Caltrop Family										
	Fagonia laevis	California fagonbush			✓			✓	✓	✓
	Larrea tridentata	creosote bush			✓			✓	✓	✓
	Kallstroemia parviflora	warty caltrop								
RARE PLANT TARGET LIST										
	Acleisanthes longiflora	Angel trumpets								
	Androstephium breviflorum	small-flowered androstephium								
	Astragalus insularis var. harwoodii	Harwood's milkvetch								
	Astragalus lentiginosus var. coachellae	Coachella Valley milkvetch								
	Ayenia compacta	California ayenia								
	Calliandra eriophylla	Fairyduster								

Family	Scientific Name	Common Name	Phenology(ies)				Day(s)			
			D	V	B	F	M	T	W	Th
Papaveraceae – Poppy Family										
	Eschscholzia glyptosperma	desert poppy , desert golden poppy								
	Eschscholzia minutiflora	pygmy poppy, Coville's poppy			✓			✓	✓	
Plantaginaceae – Plantain Family										
	Plantago ovata	desert Indianwheat, woolly plantain			✓			✓	✓	✓
Polemoniaceae – Phlox Family										
	Gilia brecciarum ssp. *brecciarum*	Nevada gilia								
	Gilia latifolia	broadleaf gilia								
	Gilia stellata	star gilia			✓			✓	✓	
	Langloisia setosissima ssp. *setosissima*	bristly langloisia								✓
	Linanthus jonesii	Jones' linanthus			✓			✓	✓	✓
	Loeseliastrum schottii	Schott's calico			✓			✓	✓	
Polygonaceae – Buckwheat Family										
	Chorizanthe brevicornu var. *brevicornu*	brittle spineflower			✓			✓	✓	✓
	Chorizanthe corrugata	wrinkled spineflower								
	Chorizanthe rigida	spiny-herb			✓			✓	✓	✓
	Eriogonum inflatum var. *inflatum*	desert trumpet			✓			✓		✓
	Eriogonum reniforme	kidneyleaf buckwheat								
	Eriogonum thomasii	Thomas Eriogonum			✓			✓	✓	✓
	Eriogonum trichopes	little deserttrumpet								✓

TED ST. JOHN
SPECIES OBSERVED ON ROUTE FOR APRIL 6 2010

BLYTHE

INSTRUCTIONS: Please mark the plant species you see, including the day(s) of observation and the phenology(ies) observed. Mark the DOMINANT phenology with an "X", and all other observed phonologies with an "O".

There is additional room for new species at the bottom of each list.

If you observe a species that you are not sure of... please collect it! If you can't collect it because it is not fruiting, etc. or the population is too small, then photograph it! Take it back to the motel and key the darn thing if you can. It is on, or may be on, our rare plant hit list. ☺

Phenology Codes: D = Dead/Dormant, V = Vegetative, B = Blooming, F = Fruiting

APRIL 6

Family	Scientific Name	Common Name	Phenology(ies)				Day(s)			
			D	V	B	F	M	T	W	Th
		GNETALES								
Ephedraceae – Ephedta Family										
	Ephedra sp.	ephedra								
		MONOCOTS								
Agavaceae – Century Plant Family										
	Hesperocallis undulata	desertlily			✓			✓		
Poaceae – Grass Family										
	Aristida adscensionis	sixweeks threeawn								
	Aristida purpurea	purple threeawn								
	Bouteloua barbata var. *barbata*	sixweeks grama								
	Bromus madritensis ssp. *rubens**	red brome, foxtail chess								
	Erioneuron pulchellum (*syn. Dasyochloa pulchella*)	fluff grass								
	Pleuraphis rigida	big galleta grass			✓	✓		✓		
	*Schismus arabicus**	Mediterranean grass			✓			✓		
	*Vulpia bromoides**	brome fescue								
	Vulpia octoflora	sixweeks fescue								
		DICOTS								
Asclepiadaceae – Milkweed Family										
	Asclepias subulata	rush milkweed								
	Cynanchum utahense	Utah cynanchum								
	Sarcostemma cynanchoides	climbing milkweed								

Family	Scientific Name	Common Name	Phenology(ies)				Day(s)			
			D	V	B	F	M	T	W	Th
	ssp. *hartwegii*									
	Sarcostemma hirtellum	trailing townula, hairy milkweed								
Asteraceae – Sunflower Family										
	Adenophyllum porophylloides	San Felipe dyssodia								
	Ambrosia dumosa	burroweed , white bursage			✓	✓		✓		
	Atrichoseris platyphylla	parachute plant , gravel ghost								
	Bebbia juncea var. *aspera*	sweetbush								
	Calycoseris wrightii	white tackstem			✓	✓		✓		
	Chaenactis carphoclinia	pebble pincushion								
	Chaenactis stevioides	desert pincushion			✓	✓		✓		
	Encelia farinosa var. farinosa	brittlebush, incienso								
	Encelia farinosa var. phenicodonta	dark-eyed brittlebush			✓			✓		
	Encelia frutescens	button brittlebush								
	Geraea canescens	desert-sunflower			✓	✓		✓		
	Hymenoclea salsola	cheesebush								
	Malacothrix glabrata	desert dandelion								
	Monoptilon bellioides	Mojave desertstar								
	Palafoxia arida var. *arida*	Spanish needle, desert palafox			✓			✓		
	Perityle emoryi	Emory's rockdaisy								
	Pectis papposa	chinchweed								
	Porophyllum gracile	odora								
	Prenanthella exigua	brightwhite								
	Rafinesquia neomexicana	desert chicory			✓	✓		✓		
	Senecio mohavensis	Mojave ragwort, Mohave Groundsel								
	Stephanomeria exigua	small wire lettuce								
	Stephanomeria pauciflora var. *pauciflora*	wire lettuce								
	Trichoptilium incisum	yellowhead, yellowdome								
	Trixis californica var. *californica*	American threefold								
Boraginaceae – Borage Family										
	Amsinckia menziesii var. *menziesii*	rancher's fireweed								
	Amsinckia tessellata	fiddleneck								

Family	Scientific Name	Common Name	Phenology(ies)				Day(s)			
			D	V	B	F	M	T	W	Th
	Cryptantha angustifolia	narrow leaved cryptantha			✓			✓		
	Cryptantha barbigera	bearded cryptantha								
	Cryptantha costata	ribbed cryptantha								
	Cryptantha holoptera	winged cyptantha								
	Cryptantha maritima var. maritima	Guadalupe cryptantha			✓	✓		✓		
	Cryptantha maritima var. pilosa	Guadalupe cryptantha								
	Cyptantha nevadensis var. nevadensis	Nevada catseye								
	Cryptantha pterocarya var. cycloptera	wingnut cryptantha								
	Pectocarya penicillata	chuckwalla combseed								
	Pectocarya platycarpa	broadfruit combseed								
	Pectocarya recurvata	curvenut combseed, combur								
	Plagiobothrys jonesii	Mojave popcornflower								
	Tiquilia palmeri	Palmer's coldenia								
	Tiquilia plicata	fanleaf crinklemat, plicate coldenia								
Brassicaceae – Mustard Family										
	*Brassica tournefortii**	Saharan mustard, Sahara mustard				✓		✓		
	Dithyrea californica	spectacle-pod								
	Guillenia lasiophyllum	California mustard								
	Lepidium lasiocarpum	pepperweed			✓	✓		✓		
	*Sisymbrium irio**	London rocket								
	Tropidocarpum gracile	dobie pod								
Cactaceae – Cactus Family										
	Echinocactus polycephalus var. *polycephalus*	cottontop cactus, clustered barrel cactus								
	Ferocactus cylindraceus var. *cylindraceus*	California barrel cactus								

Family	Scientific Name	Common Name	Phenology(ies)				Day(s)			
			D	V	B	F	M	T	W	Th
	Mammillaria tetrancistra	common fishhook cactus								
	Opuntia basilaris	beavertail cactus								
	Opuntia echinocarpa (*Cylindropuntia e.*)	silver cholla, golden cholla								
	Opuntia ramosissima (*Cylindropuntia r.*)	pencil cactus, diamond cholla								
	Nemacladus	threadplant								
Chenopodiaceae – Goosefoot Family										
	Atriplex polycarpa	allscale saltbrush								
	Atriplex hymenelytra	desert holly								
	Chenopodium murale	nettleleaf goosefoot								
	Chenopodium sp.	goosefoot								
	*Salsola tragus**	Russian thistle, tumbleweed								
Cucurbitaceae – Gourd Family										
	Brandegea bigelovii	desert starvine								
Euphorbiaceae – Spurge Family										
	Chamaesyce polycarpa	smallseed sandmat								
	Ditaxis lanceolata	Narrowleaf ditaxis, narrowleaf silverbush								
	Ditaxis neomexicana	New Mexico ditaxis								
	Euphorbia eriantha	beetle spurge								
Fabaceae – Legume Family										
	Acacia gregii	catclaw								
	Astragalus nuttallianus var. *imperfectus*	turkey peas				✓		✓		
	Astragalus insularis var. *harwoodii*	Harwood's milkvetch				✓		✓		
	Cercidium floridium ssp. *floridium*	blue palo verde								
	Dalea mollis	silky dalea, hairy prairie clover			✓			✓		

Family	Scientific Name	Common Name	Phenology(ies)				Day(s)			
			D	V	B	F	M	T	W	Th
	Dalea mollissima	hairy dalea, downy dalea								
	Lotus strigosus var. *tomentellus*	strigose bird's-foot trefoil			✓			✓		
	Lotus wrangelianus	Chilean bird's-foot trefoil								
	Lupinus cf. *arizonicus*	Arizona lupine			✓			✓		
	Marina parryi	Parry's false prairie clover								
	Olneya tesota	ironwood								
	Prosopis glandulosa	honey mesquite								
	Psorothamnus spinosum	smoke tree								
	Senna armata	spiny senna, desert senna								
Fouquieriaceae – Ocotillo Family										
	Fouquieria splendens ssp. *splendens*	ocotillo								
Geraniaceae – Geranium Family										
	Erodium texanum	Texas storksbill, Desert Heron's Bill			✓	✓		✓		
Hydrophyllaceae – Waterleaf Family										
	Eucrypta micrantha	dainty desert hideseed								
	Nama demissum var. *demissum*	purplemat			✓			✓		
	Phacelia crenulata var. *ambigua*	purplestem phacelia								
	Phacelia crenulata var. *minutiflora*	cleftleaf wildheliotrope								
	Phacelia neglecta	alkali phacelia			✓			✓		
	PLAGIOBOTHRYS JONESII									
Krameriaceae – Rhatany Family										
	Krameria erecta	Pima rharany, littleleaf ratany								
	Krameria grayi	white rhatany				✓		✓		

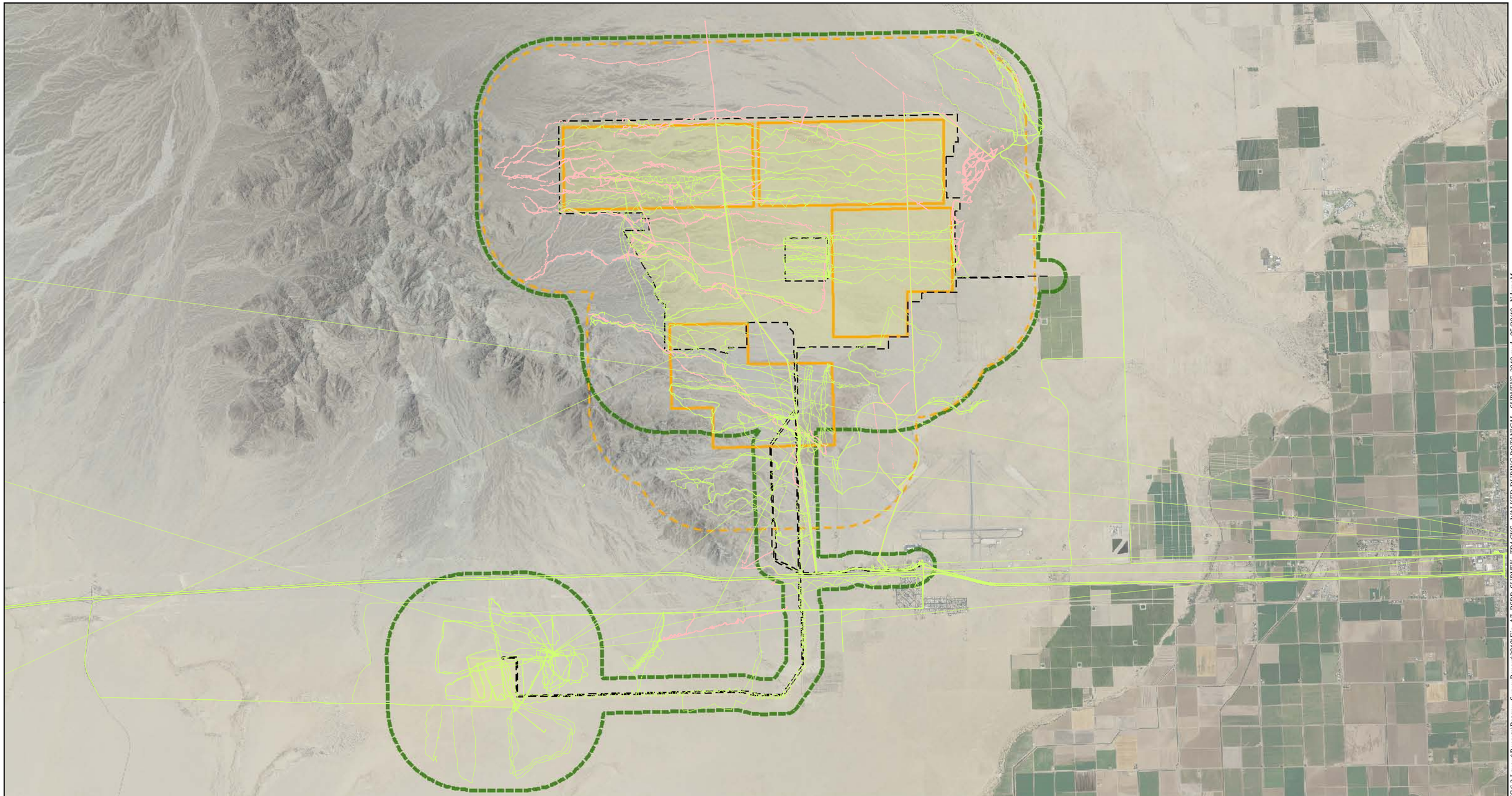
Family	Scientific Name	Common Name	Phenology(ies)				Day(s)			
			D	V	B	F	M	T	W	Th
Lamiaceae – Mint Family										
	Hyptis emoryi	desert-lavender								
Loasaceae – Loasa Family										
	Mentzelia cf. *albicaulis*	small flowered blazing star, white stemmed stickleaf								
	Mentzelia involucrata	whitebract blazingstar								
Malvaceae – Mallow Family										
	Eremalche rotundifolia	desert five-spot								
	Hibiscus denudatus	paleface								
	Sphaeralcea ambigua	desert globemallow , apricot mallow								
Martyniaceae – Unicorn-Plant Family										
	Proboscidea althaeifolia	desert unicorn-plant								
Nyctaginaceae – Four O'Clock Family										
	Abronia villosa var. *villosa*	desert sand verbena			✓			✓		
	Allionia incarnata	trailing allionia, windmills								
	Boerhavia	spiderling								
	Mirabilis bigelovii	wishbone bush								
Onagraceae – Evening Primrose Family						✓		✓		
	Camissonia boothii ssp. *desertorum*	desert suncup			✓			✓		
	Camissonia brevipes ssp. *brevipes*	golden suncup								
	Camissonia cf. *cardiophylla*	heartleaf suncup								
	Camissonia claviformis	browneyes								
	Camissonia refracta	narrowleaf suncup								
	OENOTHERA PRIOMORIS				✓			✓		

Family	Scientific Name	Common Name	Phenology(ies)				Day(s)			
			D	V	B	F	M	T	W	Th
Papaveraceae – Poppy Family										
	Eschscholzia glyptosperma	desert poppy , desert golden poppy								
	Eschscholzia minutiflora	pygmy poppy, Coville's poppy								
Plantaginaceae – Plantain Family										
	Plantago ovata	desert Indianwheat, woolly plantain			✓			✓		
Polemoniaceae – Phlox Family										
	Gilia brecciarum ssp. *brecciarum*	Nevada gilia								
	Gilia latifolia	broadleaf gilia								
	Gilia stellata	star gilia								
	Langloisia setosissima ssp. *setosissima*	bristly langloisia			✓			✓		
	Linanthus jonesii	Jones' linanthus								
	Loeseliastrum schottii	Schott's calico								
Polygonaceae – Buckwheat Family										
	Chorizanthe brevicornu var. *brevicornu*	brittle spineflower			✓			✓		
	Chorizanthe corrugata	wrinkled spineflower								
	Chorizanthe rigida	spiny-herb								
	Eriogonum inflatum var. inflatum	desert trumpet								
	Eriogonum reniforme	kidneyleaf buckwheat								
	Eriogonum thomasii	Thomas Eriogonum			✓			✓		
	Eriogonum trichopes	little deserttrumpet								

Family	Scientific Name	Common Name	Phenology(ies)				Day(s)			
			D	V	B	F	M	T	W	Th
Resedaceae – Mignonette Family										
	Oligomeris linifolia	lineleaf whitepuff								
Rhamnaceae – Buckthorn Family										
	Colubrina californica	las animas colubrina								
	Ziziphus cf. *obtusifolia* var. *canescens*	graythorn								
Scrophulariaceae – Figwort Family										
	Antirrhinum filipes	twining snapdragon								
	Mohavea confertiflora	ghost flower								
Solanaceae – Nightshade Family										
	Lycium andersonii	water jacket, Anderson's desert thorn								
	Physalis hederifolia var. *fendleri*	Fendler's groundcherry								
Tamaricaceae – Tamarisk Family										
	Tamarix sp. *	Tamarisk								
Viscaceae – Mistletoe Family										
	Phoradendron californicum	desert mistletoe								
Zygophyllaceae – Caltrop Family										
	Fagonia laevis	California fagonbush								
	Larrea tridentata	creosote bush			✓			✓		
	Kallstroemia parviflora	warty caltrop								
RARE PLANT TARGET LIST										
	Acleisanthes longiflora	Angel trumpets								
	Androstephium breviflorum	small-flowered androstephium								
	Astragalus insularis var. harwoodii	Harwood's milkvetch								
	Astragalus lentiginosus var. coachellae	Coachella Valley milkvetch								
	Ayenia compacta	California ayenia								
	Calliandra eriophylla	Fairyduster								

ATTACHMENT 8

SURVEY TRACKS WALKED
DURING BOTANICAL SURVEYS



Map Location

Legend

- Proposed Project Study Area
- Proposed Project BRSA
- Project Disturbance Area
- Reconfigured Alternative Disturbance Area
- Reconfigured Alternative BRSA
- Track Logs (2010)
- Track Logs (2009) Incomplete

Source: NAIP 2009; AECOM 2009

N
W E
S

1 in = 6,000 feet

0 6,000 12,000 Feet

Blythe Solar Power Project
Botanical Survey Report

Figure A7
Survey Tracks Walked during Botanical Surveys

AECOM

Date: June 2010

Path: P:\2009\908082 Sol Mil Blythe\6.0 GIS\6.3 Layout\Reports\Botany_SurveyReport\2010\Fig_A7_BSPP_SURVEY_TRACKS_WALKED DURING BOTANICAL_SURVEYS_2010.mxd, 05/20/10, NdemoM

ATTACHMENT D

DESERT TORTOISE TECHNICAL REPORT

BLYTHE SOLAR POWER PROJECT
DESERT TORTOISE TECHNICAL REPORT
RIVERSIDE COUNTY, CALIFORNIA

Prepared for:

Palo Verde Solar I, LLC
1625 Shattuck Avenue, Suite 270
Berkeley, California 94709

Prepared by:

AECOM
1420 Kettner Boulevard, Suite 500
San Diego, California 92101
Phone: (619) 233-1454
Fax: (619) 233-0952
Contact: Julie Ogilvie

June 2010

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4 Field Datasheets – Spring 2010
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ATTACHMENT 1 – FIGURES

Figure

1 Regional Map
2 Project Disturbance Area and Biological Resources Survey Area
3 Reconfigured Alternative Disturbance Area and Biological Resources Survey Area
4 Vegetation Communities
5 Desert Tortoise Survey Area
6 Desert Tortoise Suitable Habitat within the Proposed Project Biological Resources Survey Area
7 Desert Tortoise Suitable Habitat within the Reconfigured Alternative Biological Resources Survey Area
8 USGS Desert Tortoise Habitat Model
9 2010 Desert Tortoise Observations within the Proposed Project Biological Resources Survey Area
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INTRODUCTION

AECOM performed biological resources studies for Palo Verde Solar I, LLC, who is the Applicant for the proposed Blythe Solar Power Project (Project or BSPP). This report is a supplement to the January 2010 report with the same title (AECOM 2010). Subsequent to the preparation of the January 2010 report and Application for Certification (AFC) in August (AECOM 2009), Palo Verde Solar I made various minor modifications to the BSPP in areas that had not yet been surveyed. Additionally, a Reconfigured Alternative was analyzed in the March 2010 California Energy Commission (CEC) Staff Assessment/Draft Environmental Impact Statement (SA/DEIS). Several areas of the Reconfigured Alternative were in locations previously not surveyed. The results of the desert tortoise (*Gopherus agassizii*; DT) 2010 biological surveys within the previously unsurveyed areas are included herein. As a component of the needed biological resources work, presence/absence surveys for the Federal- and State-endangered DT within the added areas of the Project Disturbance Area and Reconfigured Alternative, as well as within the buffers associated with these features, were conducted in spring 2010, as reported here and in the January 2010 report.

PROPOSED PROJECT AND RECONFIGURED ALTERNATIVE DESCRIPTION

The following terms will be used throughout this report:

- AFC Disturbance Area: This is the original Disturbance Area as reported in the AFC, submitted in August 2009.

- Project Disturbance Area: This is the proposed BSPP Disturbance Area that includes the entire Proposed Project footprint (area within solar plant site fence line including solar fields, power block, transmission facilities, office and maintenance buildings, lay down area, bioremediation area, and leach fields as described in further detail below). It does not include the Colorado River Substation (CRSS), which will be permitted, constructed and operated by Southern California Edison (SCE).

- Proposed Project Study Area: This includes the proposed BSPP Disturbance Area plus additional areas surveyed during 2009 and 2010 but that ultimately will not be disturbed by BSPP, such as the survey area for the CRSS and associated buffers that will be permitted, constructed and operated by SCE.

- Proposed Project BRSA: The Proposed Project BRSA includes the Project Disturbance Area, Proposed Project Study Area, and all associated buffers.

- Reconfigured Alternative Disturbance Area: The Reconfigured Alternative Disturbance Area encompasses the disturbance resulting from the proposed construction of the reconfigured alternative solar power blocks only (solar heat exchangers, steam turbine generator and other components listed in the project description below), and their associated solar fields.

- Reconfigured Alternative BRSA: The Reconfigured Alternative BRSA includes the Reconfigured Alternative Disturbance Area and all associated buffers.

- Combined Survey Area: The Combined Survey Area is the Proposed Project BRSA and the Reconfigured Alternative BRSA. This encompasses all areas surveyed during 2009 and 2010 (the collective total area surveyed to date by AECOM for the BSPP).

Proposed Project

The Applicant is proposing to construct the BSPP, a nominal 1,000-MW commercial solar thermal power-generating facility. The Proposed Project would be located on a 9,405-acre ROW owned by the federal government and administered by the BLM. Use of the federal land would involve issuance of a ROW grant to the Applicant by the BLM. The total Project Disturbance Area would be 7,025 acres (Figure 2). The total Proposed Project Study Area is 7,614 acres (Figure 2). The Proposed Project would use solar parabolic trough technology to generate electricity. With this technology, arrays of parabolic mirrors collect heat energy from the sun and refocus the radiation on a receiver tube located at the focal point of the parabola. A heat transfer fluid (HTF) is heated to high temperature (approximately 750 degrees Fahrenheit [°F]) as it circulates through the receiver tubes. The heated HTF is then piped through a series of heat exchangers where it releases its stored heat to generate high-pressure steam. The steam is then fed to a traditional steam turbine generator where electricity is produced.

The Proposed Project would have a nominal output of 1,000-MW, consisting of four independent 250 MW power plants (Units #1, #2, #3, and #4). The units would be developed in phases, with construction scheduled to begin in late 2010 on the first unit, which unit would come on line in mid-2013.

Each power block unit would have its own solar field, composed of piping loops arranged in parallel groups, and its own power block, centrally located within the solar field. Each power block would have its own HTF pumping and freeze-protection system, solar steam generator, steam turbine generator, an air-cooled condenser for cooling, transmission lines and related electrical system, and auxiliary equipment (e.g., water treatment system, emergency generators, evaporation ponds). Major project components are identified below.

The BSPP would require a new transmission line. Transmission line features (e.g., crossing structures, pole pads, crane pads, pull sites, splice sites, spur roads, and an access road) would be located along an 8-mile transmission line corridor that extends to a point south of I-10 and then turns west (Figure 2). The transmission line and utility lines share the same corridor except where the transmission line jogs west on the north side of I-10 as shown in Figure 3. The transmission line will be connected to the new Colorado River substation that Southern California Edison (SCE) will be constructing as part of the strengthening and upgrading of its transmission network to support integration of renewable projects. Final placement and development of the substation would be the responsibility of the utility (i.e. SCE).

Access to the BSPP would be on a new road heading north from the frontage road along I-10. Only a small portion of the overall facility footprint would be paved, primarily the site access road, the service roads to the power blocks, and six acres of each of the 18-acre power blocks. The solar fields would remain unpaved and without a gravel surface to prevent mirror damage. The BSPP solar fields and support facilities perimeter would be secured with chain-link metal-fabric security fencing, controlled access gates and 30-foot-tall wind fences along the eastern and western boundaries.

Major Project Components

The major components and features of the Proposed Project (Figure 3) include:

- Solar Field and Power Block Unit #1 (northeast);
- Solar Field and Power Block Unit #2 (northwest);
- Solar Field and Power Block Unit #3 (southwest);
- Solar Field and Power Block Unit #4 (southeast);
- Access road including upgraded portion of Black Rock Road to onsite office;
- Office and parking;
- Land treatment unit (LTU) for bioremediation/land farming of HTF-contaminated soil;

- Warehouse/maintenance building, assembly hall, and laydown area;
- Onsite transmission facilities, including central internal switchyard;
- Natural gas pipeline;
- Telecommunications lines;
- Evaporation ponds;
- Dry wash rerouting; and
- Groundwater wells used for water supply.

Major components of each power block include:

- Steam generation heat exchangers;
- HTF overflow and expansion vessels;
- One auxiliary boiler;
- One steam turbine-generator (STG);
- One generator step up transformer (GSU);
- Air cooled condenser (ACC);
- One wet cooling tower for ancillary equipment;
- Water filter system and clarifier system
- Combination firewater/clarified water tank;
- Potable water system
- Demineralized water system
- Demineralized water tank
- High efficiency reverse osmosis (HERO) waste water recovery system
- Recovered water surge tank
- Evaporation waste stream pond(s)
- Water, natural gas, and HTF pipelines exiting the power block;
- Operations and maintenance buildings; and
- Transmission and telecommunications lines exiting the power block.

The Applicant has made various minor modifications to the BSPP since the AFC was submitted in August 2009. Some of these minor changes are not reflected in the March 2010 Staff Assessment/Draft Environmental Impact Statement (SA/DEIS) and reflect further definition of linear facilities and other changes required as a result of the Applicant's discussions with Staff, other regulatory agencies and the engineering team. New transmission line locations and associated buffers (as part of the Reconfigured Alternative discussed below) as well as additional

locations added due to minor Proposed Project changes were surveyed in the spring of 2010 and are the included in the findings of this report.

Changes to the Proposed Project were submitted to the CEC on April 19, 2010 and include:

- Removal of the four gas-fired HTF heaters (one per Unit) (within AFC Disturbance Area);
- Addition of an onsite concrete batch plant during construction (within AFC Disturbance Area);
- Addition of evaporation ponds to process industrial wastewater flows (within AFC Disturbance Area);
- Revision to construction water requirements, number of groundwater wells, and construction water storage approach (within AFC Disturbance Area);
- Finalization of the gen-tie line route to the SCE Colorado River Substation (portion of route outside of AFC Disturbance Area) (Figure 2);
- Clarification on the removal of the existing onsite (abandoned) natural gas pipeline;
- Changes to layout of Project facilities (within AFC Disturbance Area);
- Revisions to Project drainage system construction sequencing;
- Clarification on the paving of Black Rock Road (roadway section to be improved extends for a total length of approximately 3,500 feet; outside of AFC Disturbance Area);
- Addition of a temporary construction power line from offsite (outside of AFC Disturbance Area);
- Refinement of the daily construction schedule;
- Finalization of the telecommunications line (outside AFC Disturbance Area););
- Revised list of water treatment and hazardous materials chemicals; and
- Addition of an onsite fuel depot (within AFC Disturbance Area).

Reconfigured Alternative

At the request of the CEC, this report presents findings for the Reconfigured Alternative that was analyzed in the SA/DEIS. The Reconfigured Alternative would be a 1,000-MW solar facility, similar to the Proposed Project and in the same general location (Figure 3). Three of the proposed solar power blocks (Units 1, 2, and 4) would remain at their proposed locations. These include the two northern solar fields and the southeastern solar field. Unit 3 (the southwestern solar field) would be relocated approximately 0.8 mile south of its proposed location. Approximately 480 acres of the Reconfigured Alternative (a portion of Unit 3) would be outside

of the ROW application area, but the alternative would remain entirely within BLM managed lands.

It is important to note that the Reconfigured Alternative is not a complete engineering design. The Reconfigured Alternative Disturbance Area provides sufficient area for construction of four solar power blocks (and the components outlined above) only; it does not include shared facilities and linears. It does not include areas for access roads, office and management facilities, staging areas, land treatment unit, dry wash rerouting, water supply, transmission lines, or a substation. The Reconfigured Alternative Disturbance Area[1] would be 5,548 acres (Figure 3).

Major Reconfigured Alternative Components

The major components and features of the proposed Reconfigured Alternative include:

- Solar Field and Power Block Unit #1 (northeast);
- Solar Field and Power Block Unit #2 (northwest);
- Solar Field and Power Block Unit #3 (southwest); and
- Solar Field and Power Block Unit #4 (southeast).

Most of the Reconfigured Alternative overlaps Proposed Project and was surveyed during 2009. Unsurveyed portions of the Reconfigured Alternative were surveyed in the spring of 2010 and are included in the findings of this report.

PROPOSED PROJECT AND RECONFIGURED ALTERNATIVE SITE DESCRIPTION

The Combined Survey Area, which includes both the Proposed Project BRSA and Reconfigured Alternative BRSA, is nearly completely vacant and mostly undisturbed and is entirely owned by BLM. There are no existing structures that would need to be demolished. During World War II, the site was part of the General George S. Patton Desert Training Center, officially the California-Arizona Maneuver Area, a simulated theater of operations. The site area was heavily used by tanks and other military vehicles.

Elevation ranges from approximately 670 feet above sea level at the southwestern limits to a low of about 420 feet above sea level near the southeastern side boundary (USGS 1983). The existing topographic conditions of the Combined Survey Area show an average slope of approximately

[1] The Reconfigured Alternative Disturbance Area encompasses the disturbance caused by construction of the solar power blocks only.

1.25 percent toward the east on the west side and approximately 0.50 percent toward the southeast on the east side. The general storm water flow pattern is from the higher elevations in the McCoy Mountains, located west of the site, to the lower elevations in McCoy Wash, located east of the site. Runoff from the mountains discharges into shallow moderately defined channels at the base of the mountains and passes through the Combined Survey Area in a southeasterly direction.

Eight vegetation communities and other cover types were identified within the Combined Survey Area during the surveys, including upland, riparian, and other cover types (Figure 4). These vegetation communities are dry desert wash woodland, unvegetated ephemeral dry wash, creosote bush - big galleta grass association, Sonoran creosote bush scrub, agricultural land, stabilized and partially stabilized desert dunes, disturbed, and developed areas. The majority of the Combined Survey Area is composed of Sonoran creosote bush scrub. Plants indicative of desert dry wash woodlands follow the drainages that flow from west to east. Agricultural areas exist in the buffer area and consist of palm tree cultivation and fallow fields. The stabilized and partially stabilized desert dunes were only observed in the additional areas associated with the transmission line south of I-10. Vegetation communities are based on a classification system by R. Holland (1986). When appropriate, vegetation classification by J.O. Sawyer and T. Keeler-Wolf (1995) are also considered.

SPECIES BACKGROUND INFORMATION

The DT is listed as threatened under the Federal Endangered Species Act, with critical habitat designated by the U.S. Fish and Wildlife Service (USFWS) (1994a). The listing was initially made on August 4, 1989, by emergency rule (USFWS 1989) and by final rule on April 2, 1990 (USFWS 1990). This listing status applies to the entire population of DT except in Arizona south and east of the Colorado River, and in Mexico. An approved recovery plan has been published by USFWS (1994b). The DT was listed as threatened under the California Endangered Species Act on June 22, 1989 (CFGC 1989). No Federal designated critical habitat for the DT occurs within the BRSA.

The DT is widely distributed in the deserts of California, southern Nevada, extreme southwestern Utah, western and southern Arizona, and throughout most of Sonora, Mexico. However, populations over approximately 50 percent of its U.S. range (30 percent of its overall range) began declining in the late 1960s and early 1970s (USFWS 1990, 1994b). These declines have been attributed to several factors, paramount of which are an upper respiratory tract disease, habitat loss and fragmentation due to urbanization and off-road vehicular use, illegal collecting

and vandalism by humans, and predation on young DTs, especially by ravens (USFWS 1994b). Raven populations, for example, have exploded with the increasing use of the deserts by humans and their discarded garbage, a prime food source for ravens (Boarman 1993).

DT home range varies with locality, year, resource availability, and social interactions (Berry 1986; O'Connor et al. 1994). Male DT home range (0.04–0.31 square mile) is estimated to be twice the size of females (Burge 1977; Berry 1986). DTs use multiple dens throughout individual home ranges and appear to migrate to steeper, rockier slopes in the winter (Barrett 1990).

Suitable landscapes for DT are generally defined as alluvial fans and plains and rocky slopes at elevations of 1,969 to 3,937 feet above sea level (USFWS 2008). DTs require soils that can support burrows but also allow for excavation (Anderson et al. 2000). In some cases, DTs take advantage of existing natural shelters such as rock formations or exposed calcic soils horizons (Nussear et al. 2009). Presence of ephemeral plant species is an indicator of habitat suitability for DT because ephemeral plants are the primary components of the DT diet (Esque 1994; Jennings 1997; Avery 1998). Generally, DTs prefer creosote bush scrub habitat with a high diversity and cover of perennial plant species and high productivity of ephemeral plants. Less commonly, DT will occur in blackbrush (*Coleogyne ramosissima*), Joshua tree (*Yucca brevifolia*), and juniper (*Juniperus* sp.) at higher elevations, and saltbush (*Atriplex* sp.) at lower elevations (Nussear et al. 2009).

SURVEY METHODOLOGY

As a result of design changes and development of an alternative configuration, additional DT surveys were necessary in 2010 to fill in the survey gaps in support of the BSPP review, approval, and permitting. Survey details and methodology for areas surveyed in 2009 are described in the January 2010 DT report (AECOM 2010).

DT protocols implemented in 2010, and described herein, are consistent with 2009 survey protocols (AECOM 2010), with the exception of a few modifications. DT surveys included a combination of presence-or-absence surveys (i.e., 100 percent coverage surveys), and additional transect-based sign surveys within the project buffer zone. Project biologists Shelly Dayman, Art Davenport, Brooks Hart, and Gregg Lukasek conducted habitat assessments on February 17, 2010, in unsurveyed areas. All areas to be surveyed in 2010 were determined to contain suitable habitat for DT (the only areas containing habitat not suitable for DT were within the buffer areas).

DT presence-or-absence surveys occurred in suitable habitat within the Combined Survey Area for which surveys were not previously conducted in 2009 (Figure 5). Presence-or-absence surveys (100 percent coverage surveys) for DT during 2010 followed the guidelines published in the 1992 USFWS survey protocol (USFWS 1992), with the following exception: no surveys of the five zone of influence (ZOI) transects that are typically required outside of and parallel to the Proposed Project Study Area and Reconfigured Alternative Disturbance Area at 100, 300, 600, 1,200, and 2,400 feet were conducted. Use of the USFWS 1992 protocol with the exception of ZOI transects, rather than the revised 2009 protocol (USFWS 2009), was agreed upon by USFWS, the California Department of Fish and Game (CDFG), BLM, and CEC in 2009 prior to survey initiation per an email communication dated March 10, 2009, from Julie Vance (refer to Section 2.2.1 of the AFC).

In accordance with the 1992 USFWS protocol, previously unsurveyed portions of the Combined Survey Area were surveyed using transects spaced approximately 30 feet apart along transects oriented north to south or along transects that were parallel to the edges of the Proposed Project Study Area and Reconfigured Alternative Disturbance Area. The survey was conducted by slowly and systematically walking linear transects while surveyors visually searched for DT and sign. Particular emphasis was placed on searching around the bases of shrubs and along the banks of shallow washes. All types of DT sign (live tortoises, shells, bones, scutes, limbs, scat, burrows, pallets, tracks, egg shell fragments, drinking sites, etc.) were recorded using a Global Positioning System (GPS) unit. If vegetation or topography reduced the surveyor's ability to see DT sign, the spacing between survey transects was reduced, as necessary. This occurred in areas with high vegetation density or where topography obscured the surveyor's ability to see DT sign.

DT presence-or-absence surveys were initiated on March 15, 2010 (with wildlife agency approval; see discussion below) at the BSPP site; at that time mean daily temperatures had reached a minimum of approximately 65°F, adequate annual forage was available for DTs, and evidence of DT activity was observed on the BSPP. The proposal to initiate presence-or-absence surveys at the BSPP site earlier than the March 25 to May 31 survey period, as stated in the UFSWS 1992 protocol, or the April through May survey period as stated in the USFWS 2009 protocol (USFWS 2009), was presented in a letter to Pete Sorenson at USFWS (dated March 2, 2010) with subsequent USFWS concurrence via email from Pete Sorenson on March 16, 2010 (Attachment 2).

To comply with the recommendations of the draft CEC *Recommended Biological Resources Field Survey Guidelines for Large Solar Projects* (CEC 2007), transects outside of and parallel to the Proposed Project Study Area and Reconfigured Alternative Disturbance Area were also

surveyed for DT and their sign (Figure 5). These CEC-required buffer transects were placed at 3,960 feet (0.75 mile) and 5,280 feet (1 mile) from and parallel to the edge of nonlinear portions of Proposed Project Study Area and Reconfigured Alternative Disturbance Area as well as at 1,000 feet from the edge of linear portions of Proposed Project Study Area and Reconfigured Alternative Disturbance Areas (e.g., transmission line) (Figure 5). The Reconfigured Alternative buffers and the Proposed Project buffers associated with the linear features and substation shown in Figure 5 were surveyed during spring 2010. Surveys along buffer transects were conducted in a similar fashion as for transects described for presence-or-absence surveys, by slowly and systematically walking linear transects while surveyors visually search for DT, their sign, or other special status species and their sign. Particular emphasis was placed on searching around the bases of shrubs and along the banks of shallow washes. These transects were more broadly focused than the DT presence-or-absence protocol transects, described above, and are not a part of the 1992 USFWS DT protocol requirements. However, they provide additional information on DT occurrence and habitat suitability as well as other biological resources in the area surrounding the Proposed Project Study Area or Reconfigured Alternative Disturbance Area.

Presence/absence and buffer transect surveys for DT were completed between March 15 and May 14, 2010. Project biologists included Michael Anguiano, Rocky Brown, Art Davenport, Shelly Dayman, Kim Fiehler, Charles German, Donna Germann, Brooks Hart, Rebecca Koller, Gregg Lukasek, Mike Rathbun, Milo Rivera, Russ Smith, Dana Terry, and Wayne Vogler.

Any DTs observed were measured at middle carapace length (MCL) and evaluated for health. Photographs of DT observations were taken when possible (e.g., animal not deep in burrow). Photographs of large carcasses and/or unusual sign were also taken. Burrows, scat, and shell remains were classed using the Information Index for Desert Tortoise Sign: Burrows and Dens, Scats and Shell Remains as in the USFWS protocol (USFWS 1992) (Attachment 3). Generally, under this classification system, burrows and pallets coded by the observer as Class 1, 2, or 3 were identified as DT burrows/pallets with greater confidence than burrows or pallets coded as Class 4 or 5, which have the potential to be DT burrows/pallets but cannot be confirmed as DT. The DT burrow classification system requires that observers determine if the burrows/pallets have been recently used and are therefore active burrows (there is DT sign present such as scat, tracks, etc.), if the burrows/pallets can be classed as definitely or possibly DT, and if the burrows are in good condition (i.e., could be used by a DT in the current condition) or deteriorated condition (i.e., would need modification by a DT to be used). Height, width, and depth (estimated) measurements of DT burrows/pallets were taken.

DT scat was classified based on qualitative observations of variables that change over time. Fresh DT scat is wet, has odor, is tightly packed, and is dark brown with a glaze. As DT scat ages, it becomes dry, the odor disappears, the color becomes bleached, and the fibers become loosely packed. Qualitative observations (whether or not the scat was wet; if it had obvious odor or was odorless; if it was glazed or had no glaze; if it was dark brown, light brown, or bleached; if the scats were loose or tightly packed) were used to classify scat according to the Information Index in Attachment 3. Scat measurements (length and width) were taken whenever possible.

DT shell remains were classed based on qualitative observations regarding the condition of the shell remains. Fresh or putrid shell remains were classified as Class 1, and disarticulated/ scattered pieces of DT bone were classified as Class 5. The following characteristics were used to determine the class of shell remains: color of the shell remains, location of scutes (adhering to bone or peeling off), condition of scutes (if scutes were peeling off bone, if growth rings on scutes were peeling), and condition of shell bones (intact or falling apart, if bone fragments are disarticulated and scattered). If bone fragments were observed, notes were taken as to whether the bones had begun to mineralize, since mineralization was observed on DT bones within the Combined Survey Area. Bones were assessed to determine whether they were becoming chalky as part of the aging process or if it appeared that the bone was being replaced by minerals and was therefore becoming more rock-like. Several bones showing mineralization were shown to paleontological crew members, and it was confirmed that some of the DT bones within the Combined Survey Area had begun to mineralize. MCL measurements were taken or estimated on DT shell remains whenever possible.

After completion of presence-or-absence surveys, results were used to calculate estimated adult DT (> 160-mm MCL) abundance within the Proposed Project Study Area and Reconfigured Alternative Disturbance Area. Abundance estimates were calculated according to the 2009 survey protocol (*Preparing for Any Action That May Occur within the Range of the Mojave Desert Tortoise* (*Gopherus agassizii*) [USFWS 2009]) if protocol assumptions were met (e.g., minimum of 20 DTs are detected).

Survey Limitations

Subterranean termite (*Reticulitermes* sp.) activity was noted on DT scat, so scat observations may have been reduced due to this activity.

Within the drainages, density of the vegetation (grasses, shrubs, and trees) may have lowered the detection rate of DT and/or DT sign. Additional effort for DT observation was expended in

thickly vegetated areas, but the density of vegetation in some areas made visual inspection difficult.

Active DT burrows may be observed (with or without recent sign), but due to DT activity or the depth of the burrow, the DT may not be observed but may still be present.

RESULTS AND DISCUSSION

During habitat assessments in spring 2010, it was determined that the majority of the unsurveyed areas contain suitable habitat for DT, with the exception of agriculture and developed land within buffer areas. Suitable habitat for both the Proposed Project and Reconfigured Alternative BRSAs for DT is mapped in Figures 6 and 7. Within the Project Disturbance Area, 7,014.8 acres is considered suitable for DT. Approximately 3,990.1 acres of this acreage is moderate quality DT habitat and 3,024.7 acres is low quality DT habitat (Figure 6). Within the Reconfigured Alternative Disturbance Area, 5,548.0 acres is considered suitable for DT. Approximately 3,017.1 acres of this acreage is moderate quality DT habitat (for this area) and 2,530.9 acres is low quality DT habitat (Figure 7).

As described in the January 2010 DT report (AECOM 2010), variations in habitat quality within the Combined Survey Area are primarily a result of greater water availability associated with mountainous areas and large drainages to the west. The drainages that flow from the mountains to the west provide areas of relatively higher productivity of forage for DT in the western portion of the Combined Survey Area. The moderate-quality habitat on the west side of the Combined Survey Area contains annual vegetation or shrub cover that is sufficient to support forage and cover needs. This habitat includes areas with high amounts of cover/forage interspersed with areas with low amounts of cover/forage (i.e., desert washes with upland desert pavement). The habitat observed on the east side of each of the BRSAs and south of I-10 is considered low quality for DT. The lower quality habitat on the east side of the Combined Survey Area has a limited availability of easily accessible washes that have sufficient cover and forage for DT or alternately the habitat has disturbance of vegetation that reduces the quality of the cover/forage for DT. Low-quality DT habitat south of I-10 is characterized by low annual forage, sandy soils, and the general lack of large drainages.

This habitat quality ranking is also consistent with an evaluation of DT habitat in the region based on a recent U.S. Geological Survey (USGS) habitat model (Nussear et al. 2009). Based on the model, habitat quality is ranked from 0 to 1, with 1 representing high-quality habitat. Values in the Project Disturbance Area range from 0.4 to 0.6 (moderate quality) in the westernmost edge

of the Project Project Disturbance Area, to 0.3 and below (low quality) for the rest of the Project Disturbance Area (Figure 8).

Despite the low-quality habitat and low potential for DT use of the eastern portion of the Combined Survey Area, it should be noted that all portions of the Combined Survey Area may be used by DT for dispersal to and from surrounding habitat, with the western and northeastern areas within the buffer near McCoy Wash potentially being used more frequently by DT than the eastern areas. DTs are known to use low-quality intermountain habitat, such as that present on the east side of the Combined Survey Area as dispersal routes over time, providing passage between high-quality habitat areas in the surrounding mountains (Averill-Murray and Averill-Murray 2005). Historically, tortoise populations in the Sonoran Desert have exchanged individuals at a rate of one migrant per generation (Averill-Murray and Averill-Murray 2005).

Observations of DT sign and DT occurrences for both the Proposed Project BRSA and Reconfigured Alternative BRSA are summarized in Tables 1 and 2, respectively. Results from 2009 are included in the tables and figures in this report for reference. A complete discussion of 2009 survey results is included in the January 2010 DT report (AECOM 2010). Figures 9 and 10 show all observations of DT sign and DT occurrences recorded during 2010 for both the Proposed Project and Reconfigured Alternative BRSAs. Figures 11 and 12 show all observations of DT sign and DT occurrences recorded during 2009 and 2010 for both the Proposed Project and Reconfigured Alternative BRSAs. Spring 2010 DT survey results are discussed in more detail below.

During spring 2010 surveys, four adult DTs were encountered during surveys. One adult DT was observed within the Reconfigured Alternative Disturbance Area. The single adult male DT observed within the Reconfigured Alternative Disturbance Area on March 19, 2010, was seen at the entrance to a DT burrow. This individual was seen again on March 20, 2010, walking across the desert pavement. Three additional adult DTs were observed outside of the Proposed Project Study Area and Reconfigured Alternative Disturbance Area, but within the buffers. On March 14, 2010, an adult DT was observed resting at the entrance of a DT burrow about ¾ mile west of the Proposed Project Study Area and Reconfigured Alternative Disturbance Area during buffer zone surveys. On March 31, 2010, a single adult male DT was observed inside a DT burrow about 1 mile to the southwest of the Reconfigured Alternative Disturbance Area during buffer zone surveys. On May 14, 2010, a single adult male DT was observed by the burrowing owl survey crew inside a DT burrow about 1 mile to the south of the Reconfigured Alternative Disturbance Area and 300 feet to the west of the Proposed Project utility corridor.

Table 1
Desert Tortoise Observations within the Proposed Project BRSA

Sign	Class*	Description	Number of Observations								
			2009			2010			Total		
			Study Area	Buffer	BRSA	Study Area	Buffer	BRSA	Study Area	Buffer	BRSA
Tortoises		adult	1	2	3		3	3	1	5	6
		adult – second observation					1	1		1	1
Tortoise Burrows	1	active (recent tortoise sign)	4	4	8	1	6	7	5	10	15
	2	definitely tortoise, good condition, no recent sign	10	4	14	2	8	10	12	12	24
	3	definitely tortoise, deteriorated	4		4		4	4	4	4	8
	4	possibly tortoise, deteriorated	24	7	31	1	5	6	25	12	37
	5	possibly tortoise, good condition	17	4	21		15	15	17	19	36
	Total		**59**	**19**	**78**	**4**	**38**	**42**	**63**	**57**	**120**
Tortoise Pallets	1	active (recent tortoise sign)	3		3				3		3
	2	definitely tortoise, good condition, no recent sign	2		2	1	6	7	3	6	9
	3	definitely tortoise, deteriorated	13	2	15		4	4	13	6	19
	4	possibly tortoise, deteriorated	72	4	76		3	3	72	7	79
	5	possibly tortoise, good condition	50	3	53		9	9	50	12	62
	Total		**140**	**9**	**149**	**1**	**22**	**23**	**141**	**31**	**172**
Tortoise Scat	1	wet or recently dried, obvious	3	1	4		1	1	3	2	5

Sign	Class*	Description	Number of Observations								
			2009			2010			Total		
			Study Area	Buffer	BRSA	Study Area	Buffer	BRSA	Study Area	Buffer	BRSA
		odor									
	2	dried with glaze, some odor, dark brown	6	1	7		1	1	6	2	8
	3	dried, no glaze or odor, light brown, tightly packed	14	3	17	1	1	2	15	4	19
	4	dried, light brown to pale yellow, loose material	6	2	8		1	1	6	3	9
	5	bleached or consisting only of plant fiber	13		13		1	1	13	1	14
	Total		**42**	**7**	**49**	**1**	**5**	**6**	**43**	**12**	**55**
Tortoise Shell Remains	2	carcass, normal color, scutes adhere to bone	4	1	5	1	2	3	5	3	8
	3	carcass, scutes peeling off bone	5	1	6		1	1	5	2	7
	4	carcass, shell bone falling apart, growth rings on scutes peeling	16	5	21		6	6	16	11	27
	5	bone fragments, not mineralized	69	8	77	10	14	24	79	22	101
		bone fragments, mineralized	268	22	290	20	38	58	288	60	348
	Total		**362**	**37**	**399**	**31**	**61**	**92**	**393**	**98**	**491**
Tortoise Fossilized Bones							1	1		1	1
Tortoise Tracks						3	3	6	3	3	6

Sign	Class*	Description	Number of Observations								
			2009			2010			Total		
			Study Area	Buffer	BRSA	Study Area	Buffer	BRSA	Study Area	Buffer	BRSA
Tortoise Egg Shell Fragments							3	3		3	3
Tortoise Drinking Depression				1	1		1	1		2	2

* Classified using the Information Index for Desert Tortoise Sign: Burrows and Dens, Scats and Shell Remains as in the USFWS Protocol (USFWS 1992) (Attachment 3).

Table 2
Desert Tortoise Observations within the Reconfigured Alternative BRSA

Sign	Class*	Description	Number of Observations								
			2009			2010			Total		
			Disturbance Area	Buffer	BRSA	Disturbance Area	Buffer	BRSA	Disturbance Area	Buffer	BRSA
Tortoises		adult	1	2	3	1	2	3	2	4	6
		adult – second observation				1		1	1		1
Tortoise Burrows	1	active (recent tortoise sign)	4	4	8	3	20	23	7	24	31
	2	definitely tortoise, good condition, no recent sign	10	4	14	1	13	14	11	17	28
	3	definitely tortoise, deteriorated	4		4	3	1	4	7	1	8
	4	possibly tortoise, deteriorated	14	14	28	4	4	8	18	18	36
	5	possibly tortoise, good condition	10	11	21		18	18	10	29	39
	Total		**42**	**33**	**75**	**11**	**56**	**67**	**53**	**89**	**142**
Tortoise Pallets	1	active (recent tortoise sign)	3		3		3	3	3	3	6
	2	definitely tortoise, good condition, no recent sign	2		2	2	13	15	4	13	17
	3	definitely tortoise, deteriorated	10	5	15		4	4	10	9	19
	4	possibly tortoise, deteriorated	59	17	76	3		3	62	17	79
	5	possibly tortoise, good condition	23	30	53	5	34	39	28	64	92
	Total		**97**	**52**	**149**	**10**	**54**	**64**	**107**	**106**	**213**
Tortoise Scat	1	wet or recently dried, obvious odor	2	2	4				2	2	4

Sign	Class*	Description	Number of Observations								
			2009			2010			Total		
			Disturbance Area	Buffer	BRSA	Disturbance Area	Buffer	BRSA	Disturbance Area	Buffer	BRSA
	2	dried with glaze, some odor, dark brown	5	2	7		2	2	5	4	9
	3	dried, no glaze or odor, light brown, tightly packed	12	5	17	1	1	2	13	6	19
	4	dried, light brown to pale yellow, loose material	6	2	8		1	1	6	3	9
	5	bleached or consisting only of plant fiber	11	2	13	1		1	12	2	14
	Total		**36**	**13**	**49**	**2**	**4**	**6**	**38**	**17**	**55**
Tortoise Shell Remains	2	carcass, normal color, scutes adhere to bone	3	2	5	1	2	3	4	4	8
	3	carcass, scutes peeling off bone	3	3	6	1		1	4	3	7
	4	carcass, shell bone falling apart, growth rings on scutes peeling	15	5	20	2	2	4	17	7	24
	5	bone fragments, not mineralized	39	36	75	11	10	21	50	46	96
		bone fragments, mineralized	147	141	288	22	32	54	169	173	342
	Total		**207**	**187**	**394**	**37**	**46**	**83**	**244**	**233**	**477**
Tortoise Fossilized Bones							1	1		1	1
Tortoise Tracks						5	2	7	5	2	7
Tortoise Egg Shell Fragments						3		3	3		3

Sign	Class*	Description	Number of Observations								
			2009			2010			Total		
			Disturbance Area	Buffer	BRSA	Disturbance Area	Buffer	BRSA	Disturbance Area	Buffer	BRSA
Tortoise Drinking Depression				1	1	1		1	1	1	2

Numerous DT burrows and pallets were observed within the Combined Survey Area in spring 2010 and are mapped in Figures 9 and 10. Three observations of Class 1 and 2 (considered recent or fresh) scat were made in 2010. One of those observations was associated with the adult male DT found on May 14 within the buffer area. Two others were located on the western and southwestern buffers of the Combined Survey Area (Figures 9 and 10). DT carcasses (relatively intact) and bone fragments were observed on the western side of the Proposed Project Study Area and Reconfigured Alternative Disturbance Area. In Figures 9 and 10, Class 2, 3, and 4 DT shell remains are shown. These are considered relatively intact carcasses here, rather than disarticulated bone fragments.

DTs were not observed within most of the active burrows, but it is possible that these are occupied burrows and DTs were not observed because DTs may have been active in another area at the time, or in some cases, it was not possible to see to the end of a deep burrow. It is also possible DTs are present in areas within the Combined Survey Area with fresh sign (i.e., fresh scat), but may not have been observed because they may have been active in another area at the time.

The concentration of DT sign in the western and southwest portions of the Combined Survey Area is consistent with the assessment of generally higher quality habitat for DT on the west and southwest sides of the Combined Survey Area (due to the proximity to mountains and greater availability of water and forage associated with related drainages). The lack of recent DT sign on the east side of the Combined Survey Area and along the transmission line corridor south of I-10 is consistent with the assessment of low-quality habitat for DT in these areas and suggests that DT has a lower probability of occurrence there. Detections on the east side and south of I-10 consisted primarily of disarticulated and scattered bone fragments. The disarticulated and scattered bone fragments found in the Combined Survey Area were only small fragments of shells and not associated with any carcass remains. Many of these small fragments were located within washes and it is likely that they may have washed east along drainages from carcasses originating in the west.

It was not possible to calculate a DT abundance estimate using the 2009 (USFWS 2009) protocol since 20 DTs must be observed for this calculation to be valid. During 2009 and 2010 the total number of DTs observed within the Proposed Project Study Area was one and the total number of DTs observed within the Reconfigured Alternative Disturbance Area was one. Because no DTs or any recent DT sign were detected on the east side of the Combined Survey Area during protocol surveys, DTs most likely occur at a very low abundance and density within this area. Only three DTs were detected on the southwest side of the Combined Survey Area during 2010; however, an abundance of recent DT sign was additionally observed throughout this portion of

the BRSA. Therefore, DT abundance and density on the west side of the Combined Survey Area are low, but probably slightly greater than in the east. The west side of the Combined Survey Area is also located closer to the neighboring mountains, is of higher quality for DT (e.g., contains higher forage productivity), and would be expected to support a greater number of DT than the east side of the Combined Survey Area.

Scanned field datasheets and a spreadsheet detailing all observations from the spring 2010 surveys are included in Attachments 4 and 5, respectively. Species observed during protocol DT surveys are included in Attachment 6. Other special-status wildlife observed during 2010 surveys include the State threatened Swainson's hawk (*Buteo swainsoni* [however, migratory only on site]). Additionally, western burrowing owl (*Athene cunicularia hypugaea*), Mojave fringe-toed lizard (*Uma scoparia*), loggerhead shrike (*Lanus ludovicianus*), and northern harrier (*Circus cyaneus* [however, migratory only on site]) were observed and are all CDFG Species of Special Concern (SSC). Ferruginous hawk (*Buteo regalis* [however, wintering only on site]) was also observed and is considered BLM sensitive. The western burrowing owl and Mojave fringe-toed lizard are also considered BLM sensitive in addition to being considered CDFG SSC.

CERTIFICATION STATEMENT

Qualified AECOM biologists who conducted DT surveys for the BSPP certify that the information in this survey report fully and accurately represents the work performed by AECOM biologists. The results of focused surveys for listed species are typically considered valid for 1 year by the resource agencies.

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ATTACHMENT 1

FIGURES

Blythe Solar Power Project
Desert Tortoise
Technical Report

Figure 1
Regional Map

Source: ESRI; AECOM 2010

AECOM

Date: June 2010

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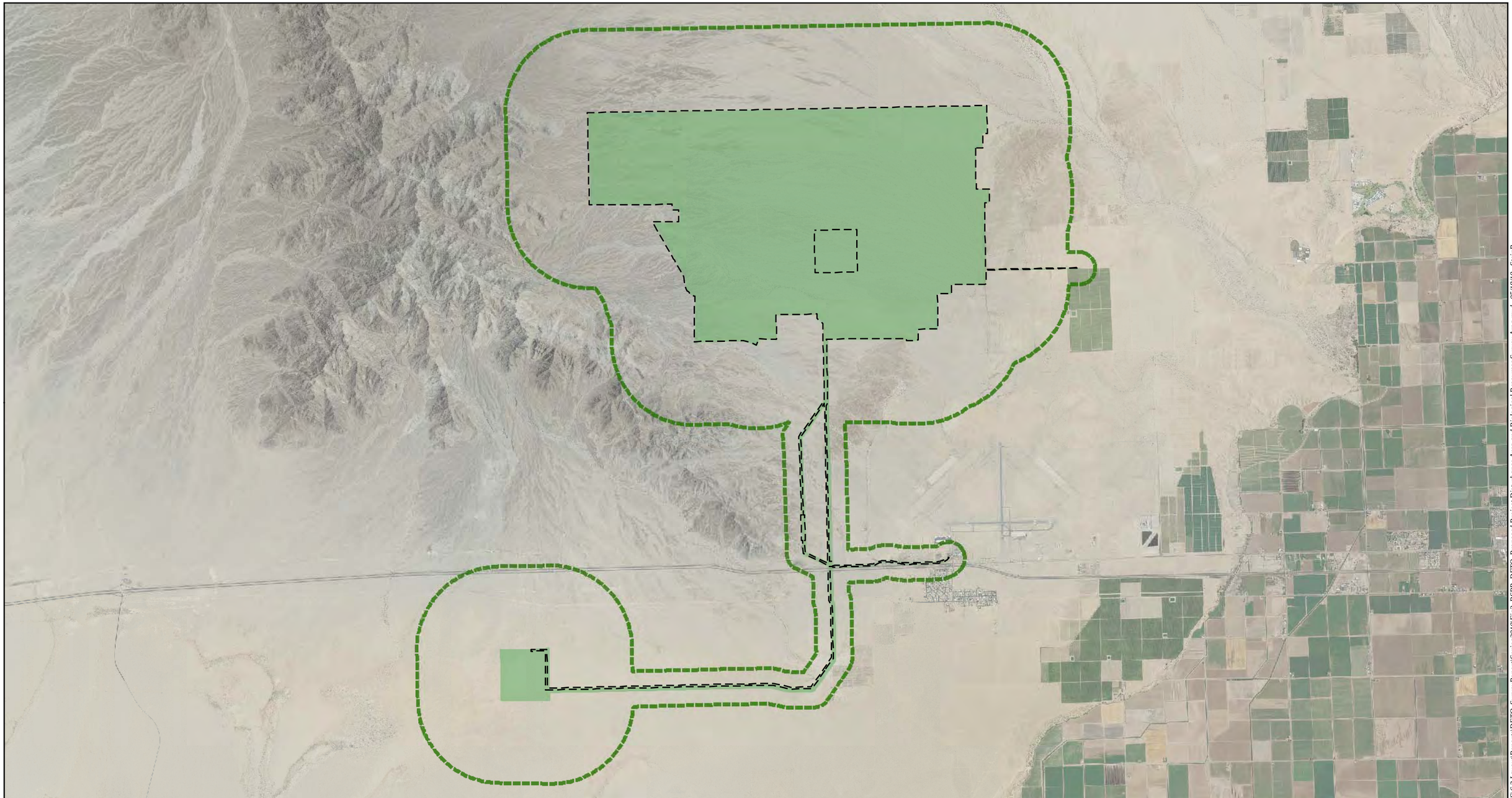

Map Location

Legend

- Proposed Project Study Area
- Project Disturbance Area
- Proposed Project BRSA

Source: NAIP 2009; AECOM 2010

N
W E
S

1 inch = 6,000 feet

0 6,000 12,000 Feet

Blythe Solar Power Project
Desert Tortoise Technical Report

Figure 2
Proposed Project
Study Area and
Biological Resources Survey Area

AECOM

Date: June 2010

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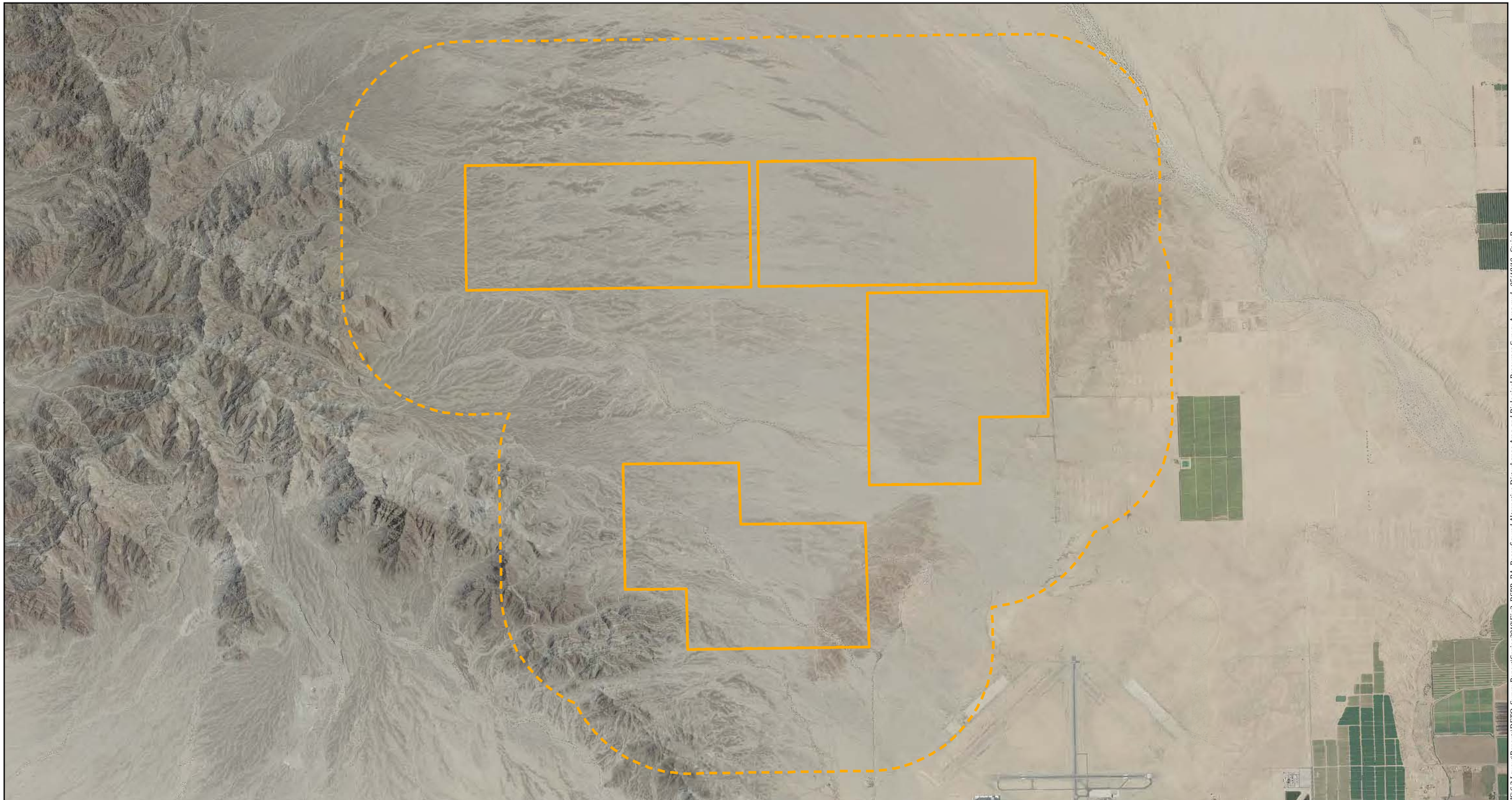

Map Location

Legend

Reconfigured Alternative Disturbance Area

Reconfigured Alternative BRSA

Source: NAIP 2009; AECOM 2009

N
W E
S

1 inch = 4,000 feet

0 4,000 8,000 Feet

Blythe Solar Power Project
Desert Tortoise
Technical Report

Figure 3
Reconfigured Alternative Disturbance Area and Biological Resources Survey Area

AECOM

Date: June 2010

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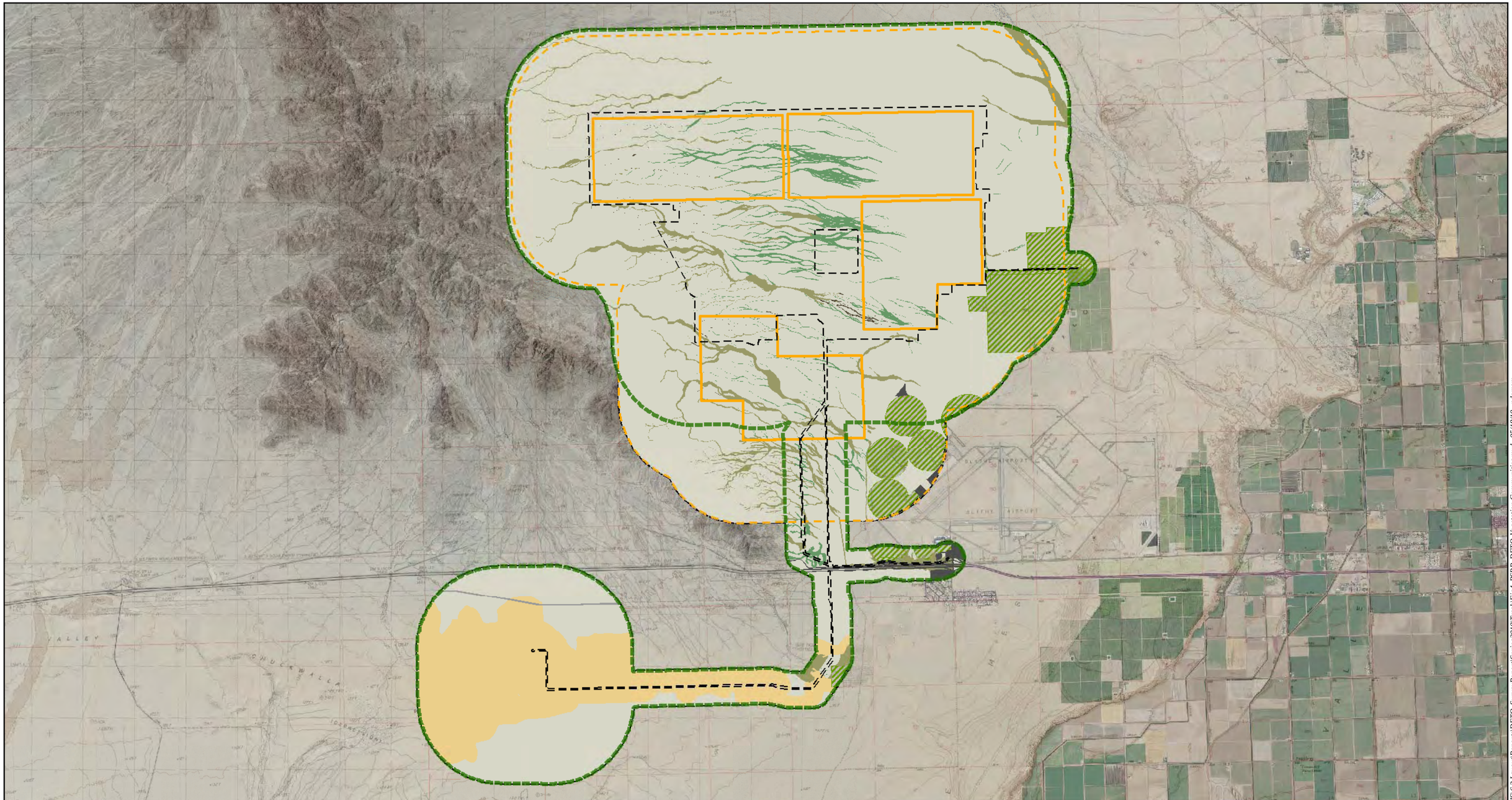

Map Location

Legend

- Project Disturbance Area
- Proposed Project BRSA
- Reconfigured Alternative Disturbance Area
- Alternative Study Area BRSA

Vegetation Communities

Riparian

- Creosote Bush - Big Galleta Association
- Desert Dry Wash Woodland
- Unvegetated Ephemeral Dry Wash

Upland

- Sonoran Creosote Bush Scrub
- Stabilized and Partially Stabilized Desert Dunes

Other

- Agriculture (Active and Fallow)
- Disturbed
- Developed

Source: NAIP 2009; USGS; AECOM 2009

N W E S

1 inch = 6,000 feet

0 6,000 12,000 Feet

Blythe Solar Power Project
Desert Tortoise Technical Report

Figure 4
Vegetation Communities

AECOM

Date: June 2010

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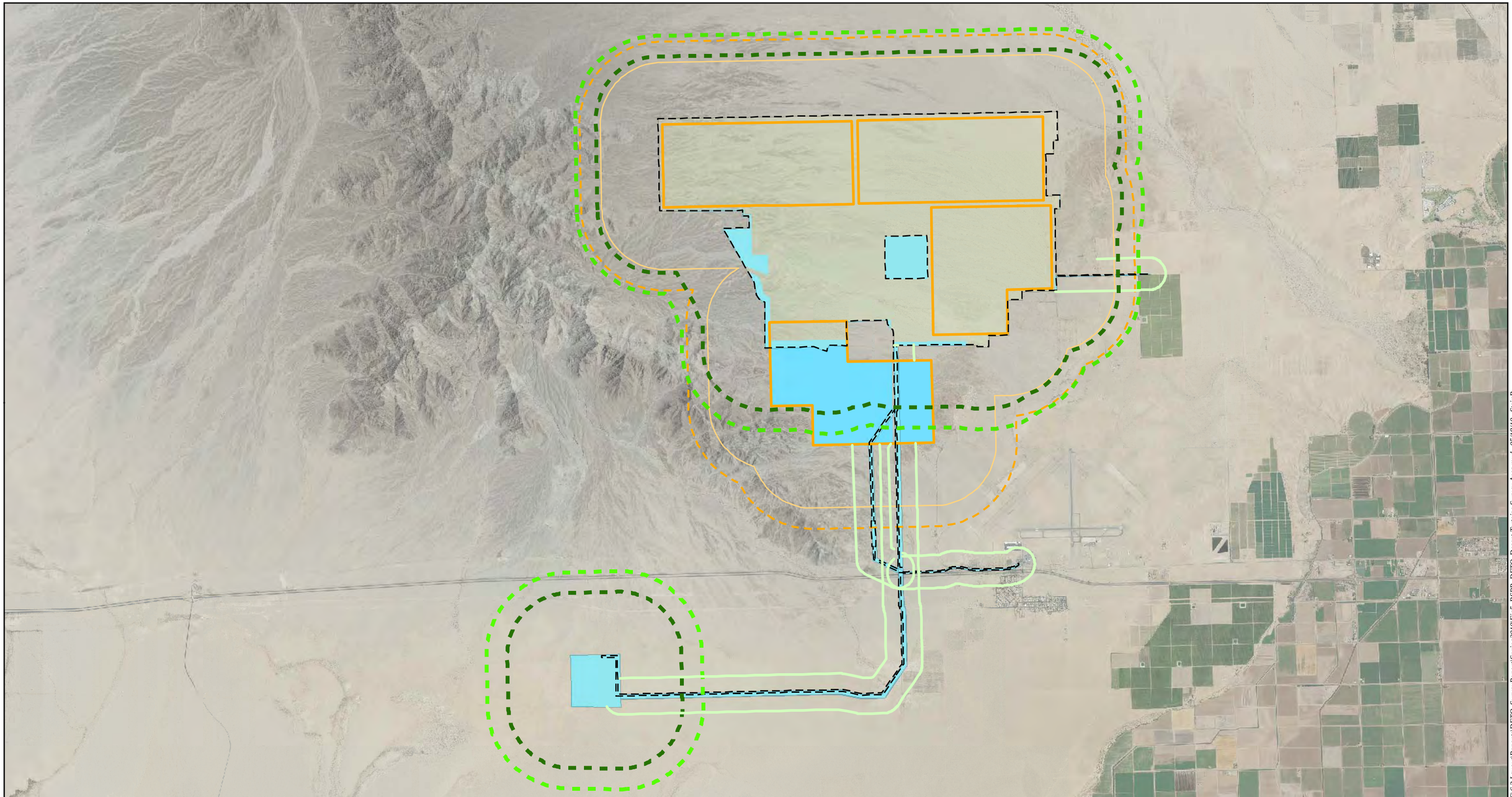

Map Location

Legend

- Proposed Project Study Area
- Survey Areas (Spring 2010)
- Project Disturbance Area
- Proposed Project 1-mile Transect
- Proposed Project 3/4-mile Transect
- Proposed Project 1000-foot Transect
- Reconfigured Alternative Disturbance Area
- Alternative Study Area 1-mile Buffer
- Alternative Study Area 3/4-mile Buffer

Source: NAIP 2009; BLM 2009; USFWS; AECOM 2010

N W E S

1 inch = 6,000 feet

0 6,000 12,000 Feet

Blythe Solar Power Project
Desert Tortoise Technical Report

Figure 5
Desert Tortoise Survey Areas

AECOM

Date: June 2010

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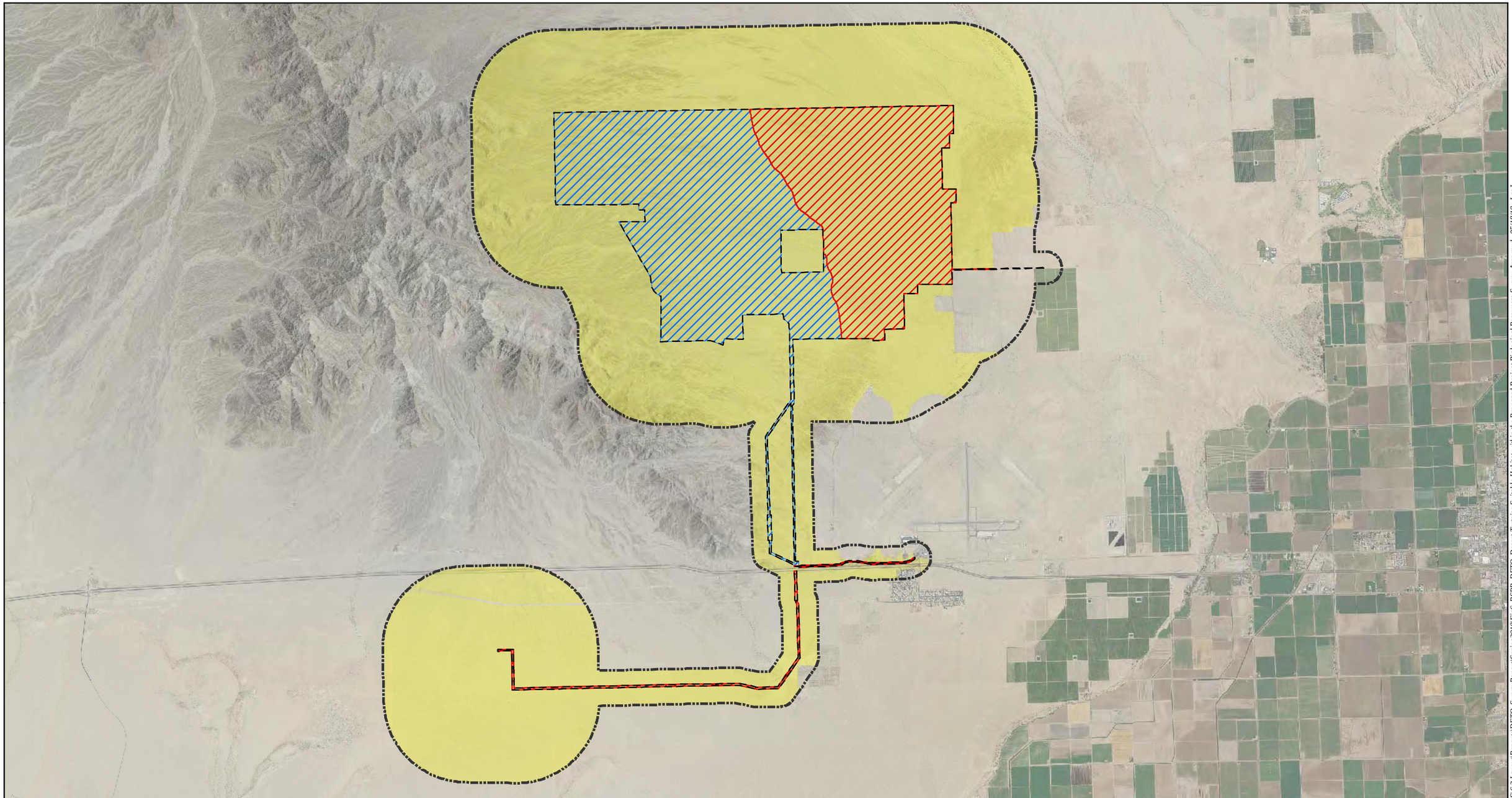

Map Location

Legend

Project Disturbance Area
Proposed Project BRSA

DETO Suitable Habitat

Suitable Habitat Quality

Low Quality DETO Habitat
Moderate Quality DETO Habitat

Source: NAIP 2009; AECOM 2009

N
W E
S

1 inch = 6,000 feet

0 6,000 12,000 Feet

Blythe Solar Power Project
Desert Tortoise Technical Report

Figure 6
Desert Tortoise Suitable Habitat within the Proposed Project Biological Resources Survey Area

AECOM

Date: June 2010

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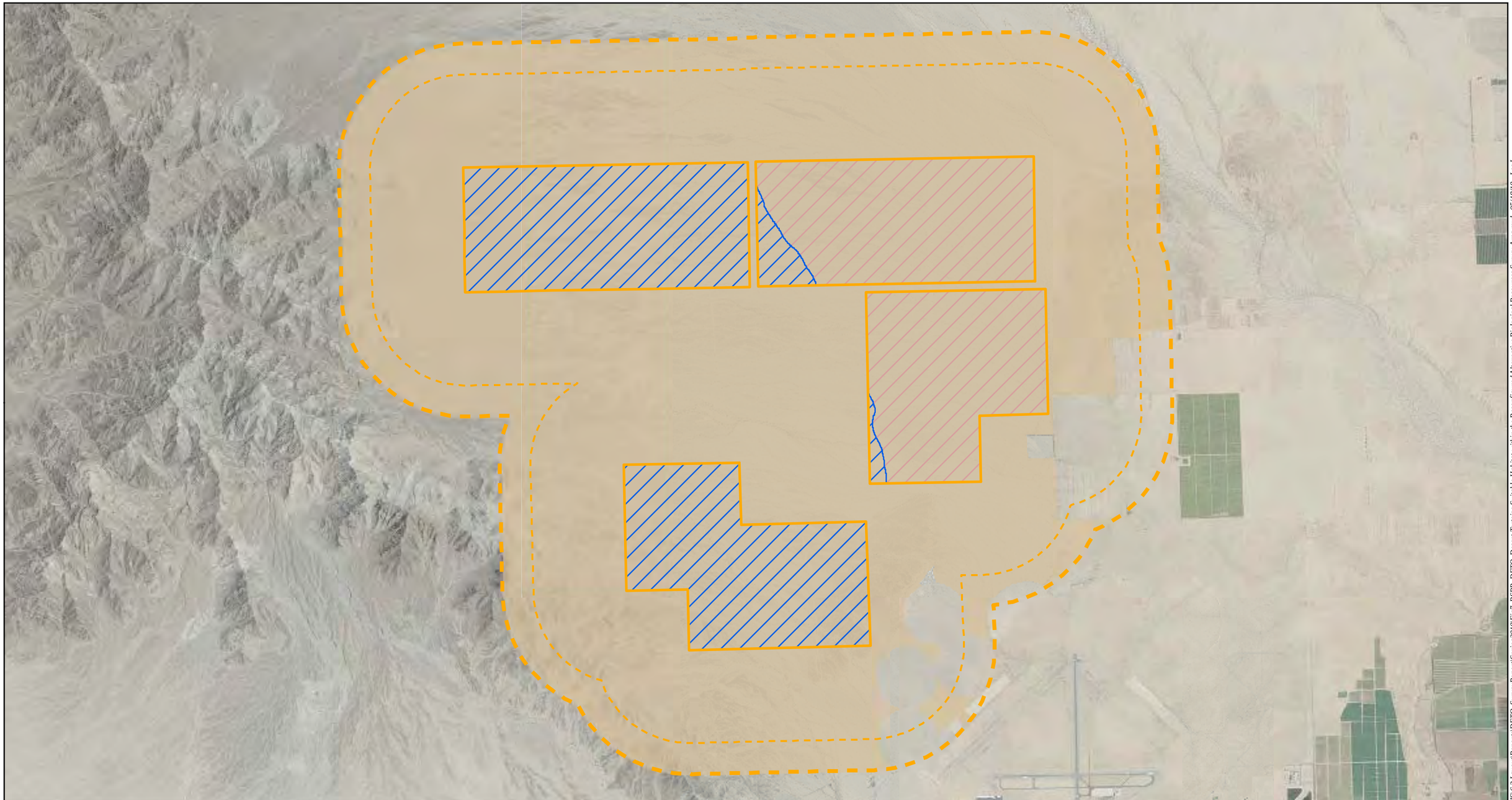


Map Location

Legend

- Reconfigured Alternative Disturbance Area
- Alternative Study Area 3/4-mile Buffer
- Alternative Study Area 1-mile Buffer
- DETO Suitable Habitat

Suitable Habitat Quality

- Low Quality DETO Habitat
- Moderate Quality DETO Habitat

Source: NAIP 2009; USGS; AECOM 2009

N
W E
S

1 inch = 4,000 feet

0 4,000 8,000 Feet

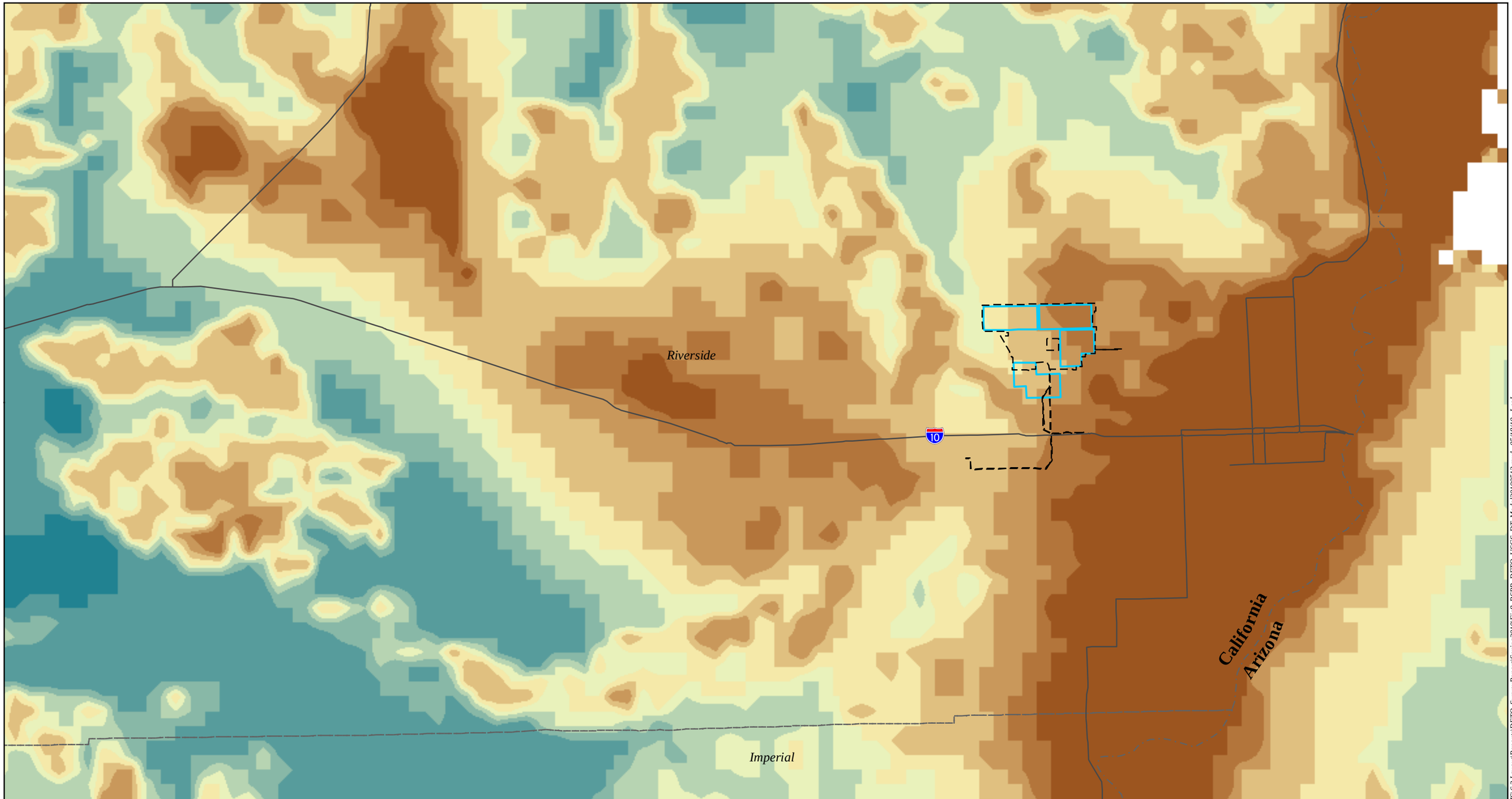
Blythe Solar Power Project
Desert Tortoise Technical Report

Figure 7
Desert Tortoise Suitable Habitat within the Reconfigured Alternative Biological Resources Survey Area

AECOM

Date: June 2010

Path: P:\20090980082 Sol M1 Blythe\6.0 GIS\6.3 Layout\Reports\DETO_SurveyReport\Spring2010\Fig7_BSPP_DETO_Desert Tortoise Suitable Habitat within the Reconfigured Alternative Biological Resources Survey Area.mxd, 05/18/10, Lee J



Map Location

Legend

USGS Desert Tortoise Model Value

- Project Disturbance Area
- Reconfigured Alternative Study Area
- California County Boundary
- Roads

0 - 0.1	0.5 - 0.6
0.1 - 0.2	0.6 - 0.7
0.2 - 0.3	0.7 - 0.8
0.3 - 0.4	0.8 - 0.9
0.4 - 0.5	0.9 - 1

Source: USGS 2009; AECOM 2009; Riverside County 2009; NHP 2003

N
W E
S

1 inch = 4 miles

0 4 8 Miles

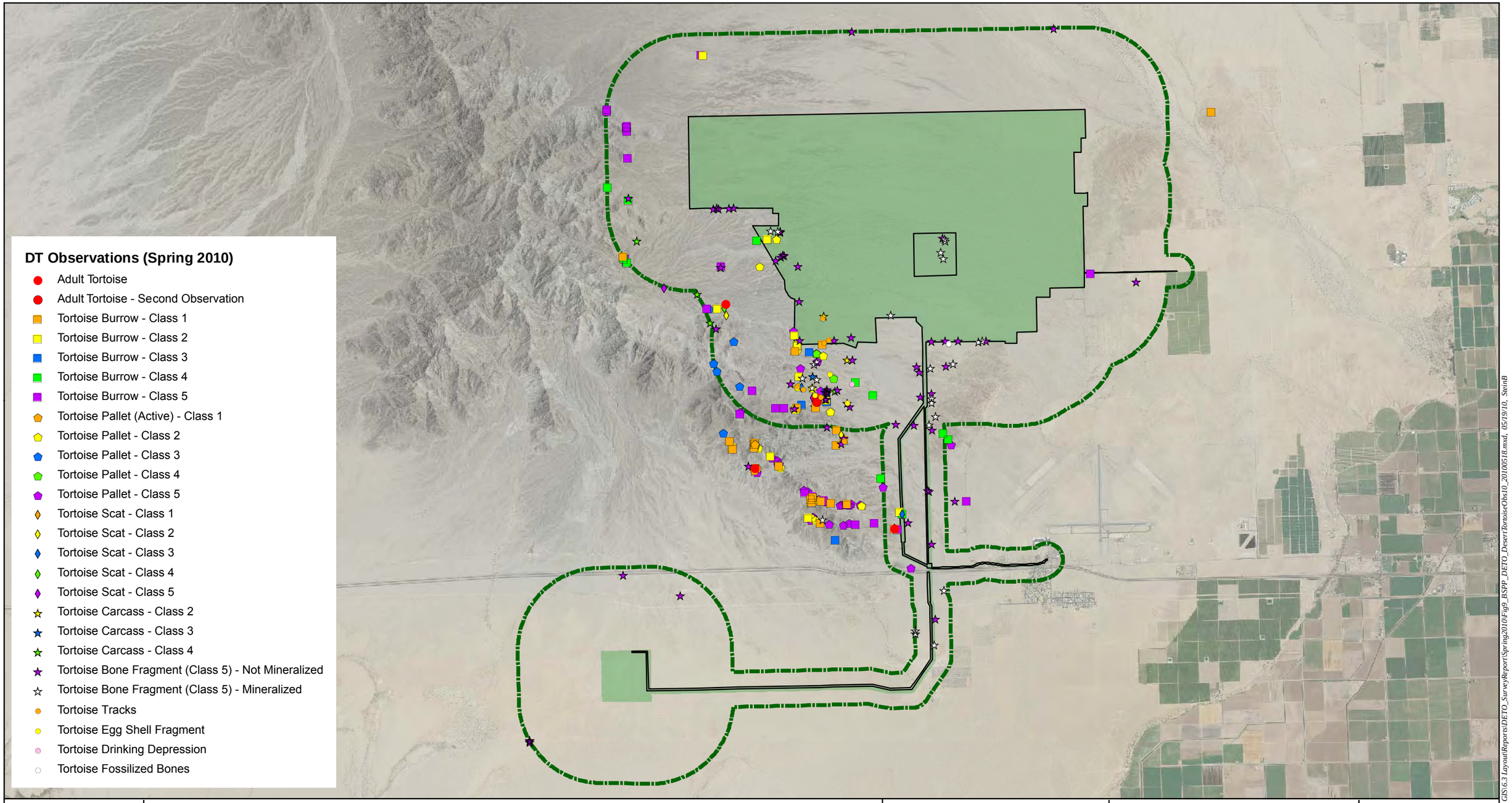
Blythe Solar Power Project
Desert Tortoise Technical Report

Figure 8
USGS Desert Tortoise Habitat Model

AECOM

Date: June 2010

Path: P:\2009\0800082 Sol MI Blythe\6.0 GIS\6.3 Layout\Reports\DETO_SurveyReport\Spring2010\Fig8_BSPP_DETO_USGS_DT_Model20100513.mxd, 05/18/10, Lee J



Map Location

Legend

- Proposed Project Study Area
- Proposed Project Disturbance Area
- Proposed Project BRSA

Source: NAIP 2009; USGS; AECOM 2009

N W E S

1 inch = 6,000 feet

0 6,000 12,000 Feet

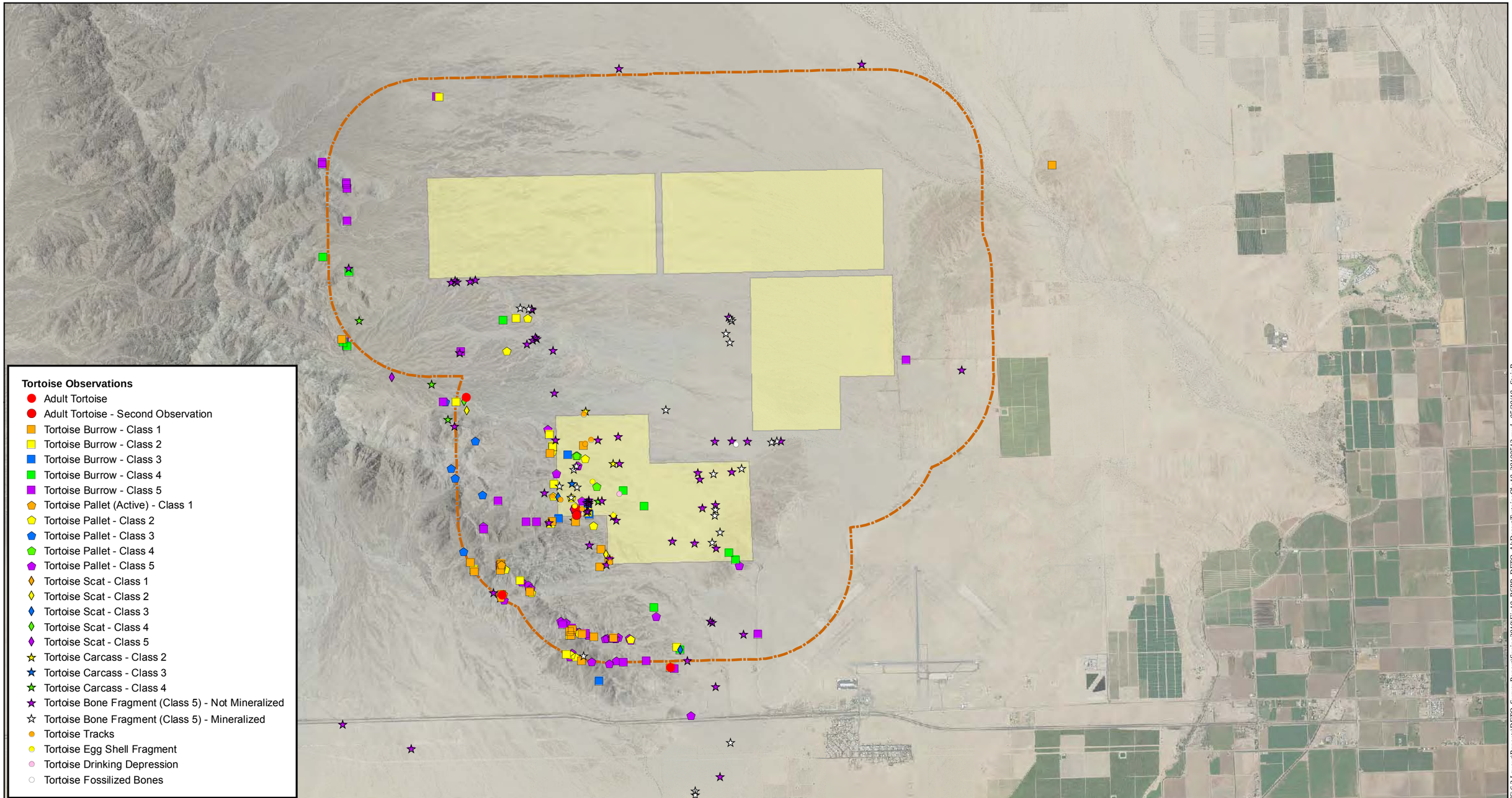
Blythe Solar Power Project
Desert Tortoise Technical Report

Figure 9
2010 Desert Tortoise Observations within the Proposed Project Biological Resources Survey Area

AECOM

Date: June 2010

Path: P:\20090\60080082 Sol MII Blythe\6.0 GIS\6.3 Layout\Reports\DETO_SurveyReport\Spring2010\Fig9_BSPP_DETO_DesertTortoiseObs10_20100518.mxd, 05/19/10, SteinB



Map Location

Legend

Reconfigured Alternative Disturbance Area

Reconfigured Alternative BRSA

Source: NAIP 2009; AECOM 2010

N
W
E
S

1 inch = 5,000 feet

0 5,000 10,000 Feet

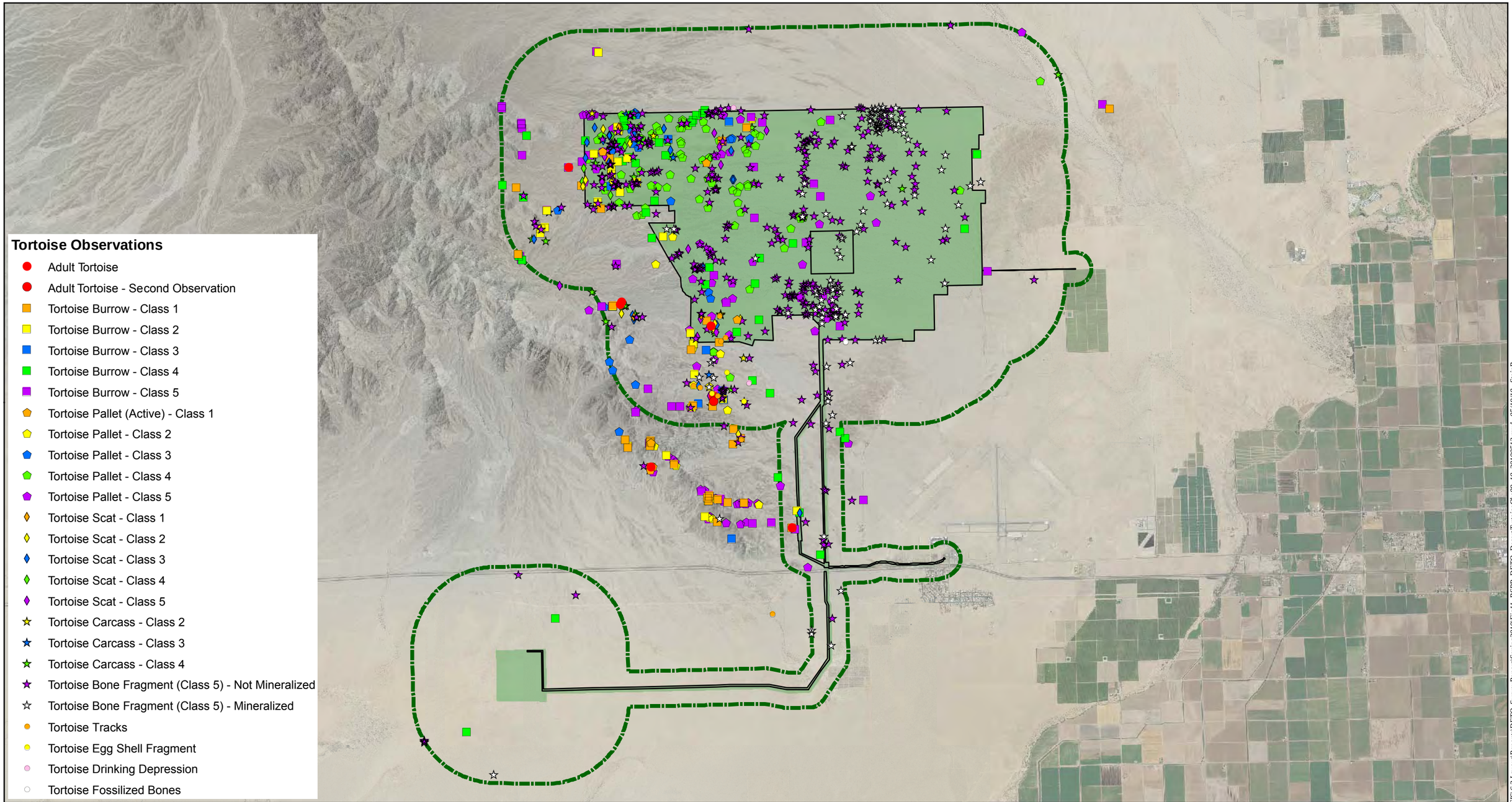
Blythe Solar Power Project
Desert Tortoise Technical Report

Figure 10
2010 Desert Tortoise Observations within the Reconfigured Alternative Biological Resources Survey Area

AECOM

Date: June 2010

Path: P:\20090980082 Sol Mil Blythe\6.0 GIS\6.3 Layout\Reports\DETO_SurveyReport\Spring2010\Fig10_BSPP_DETO_All\Desert TortoiseObs10_20100513.mxd, 05/20/10, SteinB



Map Location

Legend

- Proposed Project Study Area
- Proposed Project Disturbance Area
- Proposed Project BRSA

Source: NAIP 2009; USGS; AECOM 2009

N W E S

1 inch = 6,000 feet

0 6,000 12,000 Feet

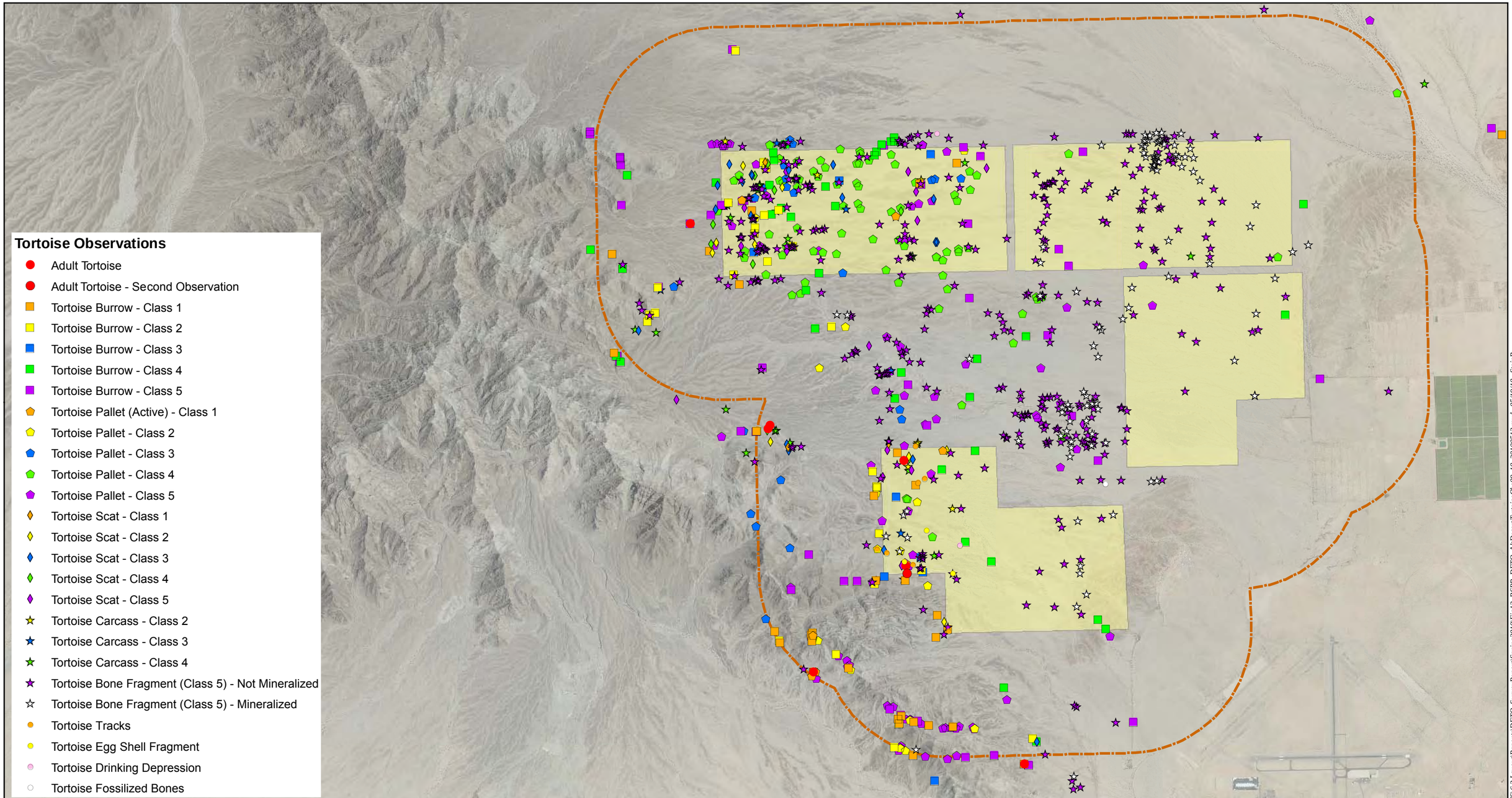
Blythe Solar Power Project
Desert Tortoise Technical Report

Figure 11
2009 - 2010 Desert Tortoise Observations within the Proposed Project Biological Resources Survey Area

AECOM

Date: June 2010

Path: P:\2009\0800082 Sol Mil Blythe\6.0 GIS\6.3 Layout\Reports\DETO_SurveyReport\Spring2010\Fig11_BSPP_DETO_DesertTortoiseObs09_10_20100513.mxd, 05/19/10, SteinB



Map Location

Legend

Reconfigured Alternative Disturbance Area

Reconfigured Alternative BRSA

Source: NAIP 2009; USGS; AECOM 2009

N
W
E
S

1 inch = 4,000 feet

0 4,000 8,000 Feet

Blythe Solar Power Project
Desert Tortoise Technical Report

Figure 12
2009 - 2010 Desert Tortoise Observations within the Reconfigured Alternative Biological Resources Survey Area

AECOM

Date: June 2010

Path: P:\20090980082 Sol Mil Blythe\6.0 GIS\6.3 Layout\Reports\DETO_SurveyReport\Spring2010\Fig12_BSPP_DETO_AllDesertTortoiseObs09_10_20100513.mxd, 05/19/10, SteinB

ATTACHMENT 2

USFWS CORRESPONDENCE

AECOM
1420 Kettner Boulevard
Suite 500
San Diego, CA 92101
www.aecom.com

619.233.1454 tel
619.233.0952 fax

March 2, 2010

Mr. Pete Sorenson
Carlsbad Fish and Wildlife Office
6010 Hidden Valley Road, Suite 101
Carlsbad, CA 92011

Subject: Desert Tortoise Presence/Absence Surveys at Palen Solar Power Project and Blythe Solar Power Project Sites, 2010

Dear Mr. Sorenson:

The purpose of this letter is to request concurrence with our proposal to initiate focused surveys for desert tortoise (*Gopherus agassizii;* DT) as early as March 10, 2010, for the Palen Solar Power Project and Blythe Solar Power Project (Projects), located in eastern Riverside County, near Blythe, California. This request is being made to capture the actual active period for the DT for this area based on the data presented herein. As you know, the protocol survey period for conducting DT presence/absence surveys is specified in the 2009 U.S. Fish and Wildlife Service (USFWS) protocol as April through May and September through October (USFWS 2009). In the 1992 USFWS protocol, the survey period is noted as March 25 to May 31 (USFWS 1992). These periods are assumed to be the active periods for DT. While the active period of April through May is applicable within the western Mojave, temperatures farther east in the Blythe area reach higher levels earlier in the season, causing the active period for DT to initiate sooner and end sooner within this area. It should also be noted that rainfall in 2010 has been above average.

In a study conducted in 2004 (Inman et al. 2009), above-ground DT activity was measured at two sites within the Western Mojave Recovery Unit: one in the Superior-Cronese and one in the Ord-Rodman Desert Wildlife Management Areas (DWMAs). One site was approximately 10 miles (16 kilometers [km]) northwest and the other 40 miles (64 km) southeast of Barstow, California. The Blythe and Palen sites are near Blythe, California, which is approximately 125 miles (201 km) to the southeast of Barstow, California. Thirty-four adult DTs were equipped with radio-transmitters and were monitored from April 1 to June 1. Above-ground activity was determined by light intensity on the DTs from dataloggers. The highest levels of surface activity were observed in April, with daily activity decreasing through the season until the end of the study in June. Fifty to 90 percent of the animals assessed as being above-ground were observed above-ground during the month of April, where maximum temperatures rarely exceeded 86 degrees Fahrenheit (°F). Animals were also not generally as active during the early morning and late evening hours, especially in mid- to late May. The DTs tended to be most active between 8 a.m. and 5 p.m. in April, and 8 to 11 a.m. in May.

While above-ground activity can be influenced by several variables, including interactions between topography, habitat type, climate, region, and behavior, it appears that the main factor influencing above-ground activity is temperature. When daily maximum temperatures exceed 86°F, the data show a noticeable drop in above-ground DT activity. This statement

is supported by the data in Figure 1 depicting the inverse relationship between the percentage of above-ground DTs observed and the maximum daily temperature at temperatures greater than 86°F. Figure 1 incorporates the information from Inman et al. (2009) on the percent of DTs above-ground with temperature data as reported on www.climate.gov for Barstow, California. Figure 2 reports the maximum daily temperatures at Barstow, California (western Mojave), and Blythe, California, from March 10 to March 31, 2009. Above-ground DT activity was noted as being highest (60 to 80 percent) when maximum air temperatures were near 80°F. When the maximum air temperature began to reach and exceed 85°F, above-ground DT activity dropped. From the Inman et al. (2009) data, it appears that DT above-ground activity is near 80 percent when mean daily temperatures are at 65°F and maximum daily temperatures are at or less than 85°F.

Based on this data, we respectfully request to initiate DT focused surveys for the Projects as early as March 10, 2010, if mean daily temperatures have exceeded 65°F by this date and if sufficient annual herbaceous forage for DT is available at that time. Given the higher-than-average rainfall this year, it is expected that annual forage should be sufficient. With this proposed start date, surveys will continue through the end of April to capture the peak activity period for DT in this area.

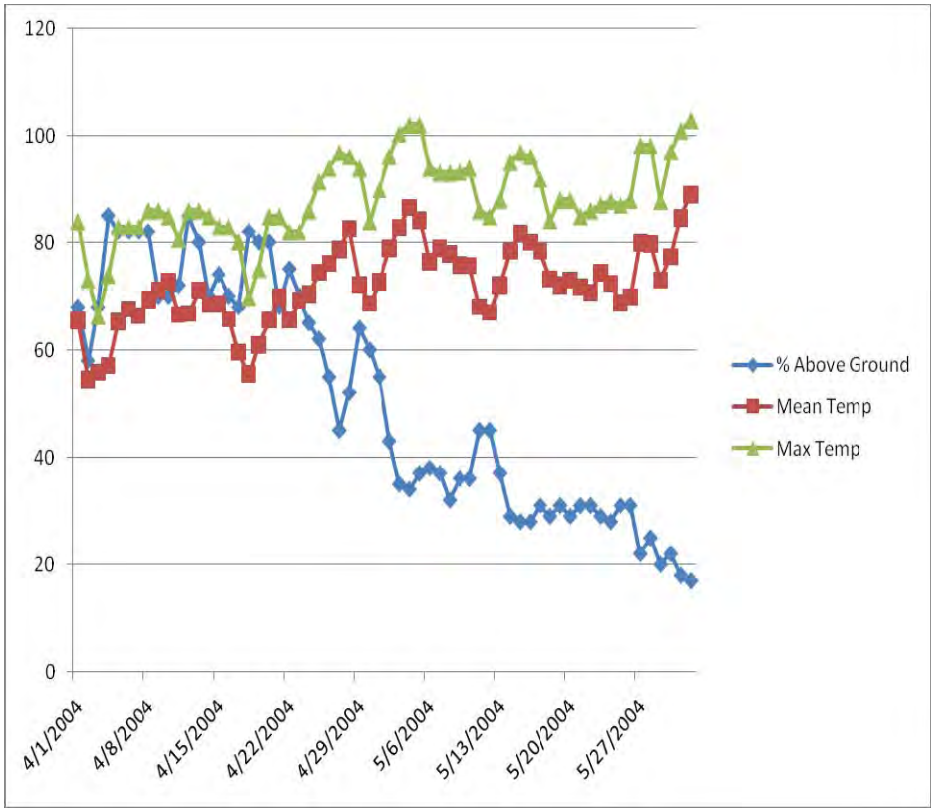


Figure 1. Percentage of DTs observed above-ground (Inman et al. 2009) compared with mean and maximum daily temperatures from Barstow, California (www.climate.gov).

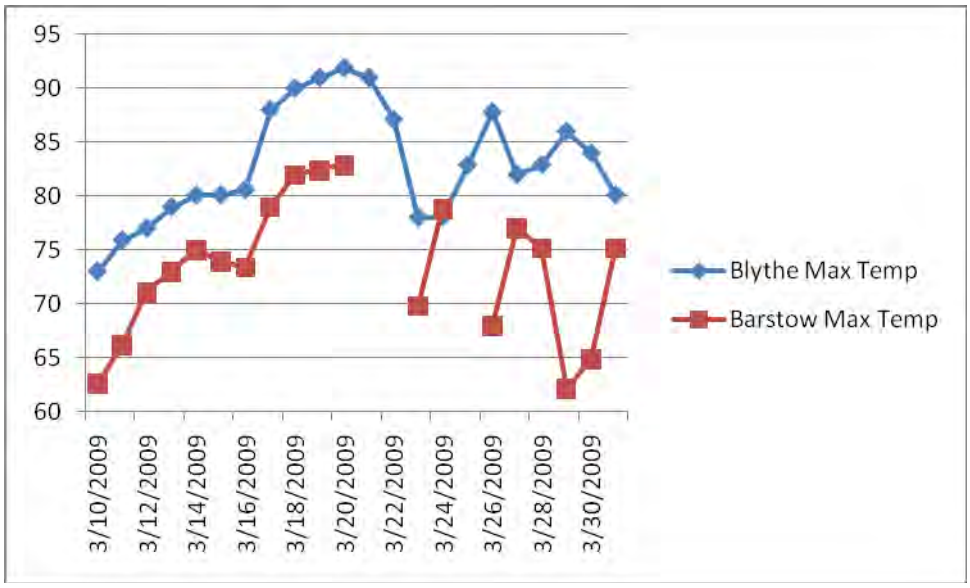


Figure 2. Maximum daily temperatures at Barstow, California (western Mojave), and Blythe, California, from March 10 to March 31, 2009. Maximum daily temperatures in Blythe average 5 to 10°F higher than in Barstow, California.

Please call me at (619) 233-1454 if you have any questions.

Sincerely,

Shelly Dayman
Wildlife Biologist

cc: Tannika Englehard, USFWS
Kim Nicol, DFG
Magdalena Rodriguez, DFG

References

Inman, R.D., K.E. Nussear, and C.R. Tracy (2009) Detecting trends in desert tortoise populations growth: Elusive behavior inflates variance in estimates in population density. Endangered Species Research.

U.S. Fish and Wildlife Service (USFWS). 1992. Field Survey Protocol for Any Federal Action that May Occur within the Range of the Desert Tortoise.

U.S. Fish and Wildlife Service (USFWS). 2009. Preparing for Any Action that May Occur within the Range of the Mojave Desert Tortoise (*Gopherus agassizii*), April.

From: Roth, Julie
To: "pete_sorensen@fws.gov";
cc: "Tannika_Engelhard@fws.gov"; "Danielle_Dillard@fws.gov"; "MCRodriguez@dfg.ca.gov"; "DHACKER@dfg.ca.gov"; "cweightman@dfg.ca.gov"; "Mark_Massar@ca.blm.gov"; "Holly_Roberts@blm.gov"; "Shelley_Ellis@ca.blm.gov"; "Larry_LaPre@ca.blm.gov"; "Ryork@energy.state.ca.us"; "KNICOL@dfg.ca.gov"; "Harron@solarmillennium.com"; "Scott Galati"; Riley, Erin; Edson, Leo; Ogilvie, Julie; Anguiano, Michael; Harbin-Ireland, Angie; Dayman, Shelly; Graham, Bill; Lindner, Carl; Bachrach, Arrie; Copley, Elizabeth; Hsia, Stephanie;
Subject: RE: 2010 Proposed Desert Tortoise Protocol for the Blythe Palen and Ridgecrest Solar Power Project sites
Date: Wednesday, March 10, 2010 12:03:00 PM
Attachments: 09080082_29_Tortoise Svy Protocol Initiation Request (3).pdf

---

Pete,

For reference I should have also attached the letter Shelly Dayman sent on March 2, 2010 providing the rationale and conditions under which surveys would be initiated earlier at Blythe and Palen. That letter is attached here. Thank you for considering this request.

Julie Roth
Wildlife Biologist
Design + Planning
D +1 530.543.5118
julie.roth@aecom.com

From: Roth, Julie
Sent: Wednesday, March 10, 2010 11:52 AM
To: 'pete_sorensen@fws.gov'
Cc: 'Tannika_Engelhard@fws.gov'; 'Danielle_Dillard@fws.gov'; 'MCRodriguez@dfg.ca.gov'; 'DHACKER@dfg.ca.gov'; 'cweightman@dfg.ca.gov'; 'Mark_Massar@ca.blm.gov'; 'Holly_Roberts@blm.gov'; 'Shelley_Ellis@ca.blm.gov'; 'Larry_LaPre@ca.blm.gov'; 'Ryork@energy.state.ca.us'; 'KNICOL@dfg.ca.gov'; 'Harron@solarmillennium.com'; 'Scott Galati'; Riley, Erin; Edson, Leo; Ogilvie, Julie; Anguiano, Michael; Harbin-Ireland, Angie; Dayman, Shelly; Graham, Bill; Lindner, Carl; Bachrach, Arrie; Copley, Elizabeth; Hsia, Stephanie
Subject: 2010 Proposed Desert Tortoise Protocol for the Blythe Palen and Ridgecrest Solar Power Project sites

Hi Pete,

As requested, please see the attached Desert Tortoise survey protocol proposed for implementation during the 2010 survey season at the Blythe, Palen and Ridgecrest Solar Power Project sites. I am sending this on behalf of Shelly Dayman who recently sent you a letter (on March 2) requesting wildlife agency concurrence with our proposed early desert tortoise survey start date (as soon as March 10, 2010 for the Blythe and Palen sites- or as soon as concurrence is received, and depending on site conditions). The survey protocol is consistent with what was implemented last year in 2009 on all three Project sites, with the exception of the proposed earlier survey initiation date.

If you could provide concurrence with the proposed protocol, including the early start date for the Blythe and Palen sites, as soon as possible, that would be greatly appreciated, as we would like to initiate DT surveys at these 2 sites this week. Thank you, and please let me know if you have any further questions on this matter.

Julie Roth
Wildlife Biologist
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Anguiano, Michael

From: Pete_Sorensen@fws.gov
Sent: Wednesday, March 10, 2010 3:12 PM
To: Roth, Julie
Cc: Harbin-Ireland, Angie; Bachrach, Arrie; Graham, Bill; Lindner, Carl; cweightman@dfg.ca.gov; Danielle_Dillard@fws.gov; DHACKER@dfg.ca.gov; Copley, Elizabeth; Riley, Erin; Harron@solarmillennium.com; Holly_Roberts@blm.gov; Ogilvie, Julie; KNICOL@dfg.ca.gov; Larry_LaPre@ca.blm.gov; Edson, Leo; Mark_Massar@ca.blm.gov; MCRodriguez@dfg.ca.gov; Anguiano, Michael; Ryork@energy.state.ca.us; Scott Galati; Shelley_Ellis@ca.blm.gov; Dayman, Shelly; Hsia, Stephanie; Tannika_Engelhard@fws.gov; Felicia_Sirchia@fws.gov
Subject: Re: 2010 Proposed Desert Tortoise Protocol for the Blythe Palen and Ridgecrest Solar Power Project sites

Julie,

Your attachment indicated maps of the locations for the proposed surveys are still being developed and will be submitted when completed. We will await those maps before concurring with the proposal. Due to continuing cold storm fronts moving through the area, ambient temperatures have not yet warmed enough for tortoises to be very active. In these low density areas, maximum tortoise activity is needed to facilitate detection. Weather forecasts suggest warmer weather may be coming next week; therefore, I do not recommend surveys until March 15, assuming the high pressure moves in and daily means exceed 70. Let's revisit the issue once we see the maps and can better determine the near-term weather forecast.

thnx, Pete

"Roth, Julie" <Julie.Roth@aecom.com>

03/10/2010 11:51 AM

To <pete_sorensen@fws.gov>

cc <Tannika_Engelhard@fws.gov>, <Danielle_Dillard@fws.gov>, <MCRodriguez@dfg.ca.gov>, <DHACKER@dfg.ca.gov>, <cweightman@dfg.ca.gov>, <Mark_Massar@ca.blm.gov>, <Holly_Roberts@blm.gov>, <Shelley_Ellis@ca.blm.gov>, <Larry_LaPre@ca.blm.gov>, <Ryork@energy.state.ca.us>, <KNICOL@dfg.ca.gov>, <Harron@solarmillennium.com>, "Scott Galati" <SGalati@gb-llp.com>, "Riley, Erin" <Erin.Riley@aecom.com>, "Edson, Leo" <leo.edson@aecom.com>, "Ogilvie, Julie" <Julie.Ogilvie@aecom.com>, "Anguiano, Michael" <Michael.Anguiano@aecom.com>, "Harbin-Ireland, Angie" <Angie.Harbin-Ireland@aecom.com>, "Dayman, Shelly" <Shelly.Dayman@aecom.com>, "Graham, Bill" <Bill.Graham@aecom.com>, "Lindner, Carl" <Carl.Lindner@aecom.com>, "Bachrach, Arrie" <Arrie.Bachrach@aecom.com>, "Copley, Elizabeth" <Elizabeth.Copley@aecom.com>, "Hsia, Stephanie" <Stephanie.Hsia@aecom.com>

Subject 2010 Proposed Desert Tortoise Protocol for the Blythe Palen and Ridgecrest Solar Power Project sites

Hi Pete,

As requested, please see the attached Desert Tortoise survey protocol proposed for implementation during the 2010 survey season at the Blythe, Palen and Ridgecrest Solar Power Project sites. I am sending this on behalf of Shelly Dayman who recently sent you a letter (on March 2) requesting wildlife agency concurrence with our proposed early desert tortoise survey start date (as soon as March 10, 2010 for the Blythe and Palen sites- or as soon as concurrence is received, and depending on site conditions). The survey protocol is consistent with what was implemented last year in 2009 on all three Project sites, with the exception of the proposed earlier survey initiation date.

If you could provide concurrence with the proposed protocol, including the early start date for the Blythe and Palen sites, as soon as possible, that would be greatly appreciated, as we would like to initiate DT surveys at these 2 sites this week. Thank you, and please let me know if you have any further questions on this matter.

Julie Roth
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work in concert with a wider range of experts to enhance and sustain
the world's built, natural and social environments.

[attachment "DT Protocol 2010 Blythe Palen Ridgecrest.doc" deleted by Pete Sorensen/CFWO/R1/FWS/DOI]

From: Pete_Sorensen@fws.gov [mailto:Pete_Sorensen@fws.gov]
Sent: Tuesday, March 16, 2010 11:22 AM
To: Dayman, Shelly
Cc: cweightman@dfg.ca.gov; Danielle_Dillard@fws.gov; DHACKER@dfg.ca.gov; Copley, Elizabeth; Riley, Erin; Felicia_Sirchia@fws.gov; Harron@solarmillennium.com; Holly_Roberts@blm.gov; Larry_LaPre@ca.blm.gov; Edson, Leo; Mark_Massar@ca.blm.gov; MCRodriguez@dfg.ca.gov; Shelley_Ellis@ca.blm.gov
Subject: RE: 2010 Proposed Desert Tortoise Protocol for the Blythe Palen and Ridgecrest Solar Power Project sites

OK, sounds like the weather is cooperating and the surveys are good to go. I would start w/ Blythe before Palen. Good luck.

"Dayman, Shelly" <Shelly.Dayman@aecom.com>

03/13/2010 05:18 PM

To <Larry_LaPre@ca.blm.gov>
cc <cweightman@dfg.ca.gov>, <Danielle_Dillard@fws.gov>, <DHACKER@dfg.ca.gov>, "Copley, Elizabeth" <Elizabeth.Copley@aecom.com>, "Riley, Erin" <Erin.Riley@aecom.com>, <Felicia_Sirchia@fws.gov>, <Harron@solarmillennium.com>, <Holly_Roberts@blm.gov>, "Edson, Leo" <leo.edson@aecom.com>, <Mark_Massar@ca.blm.gov>, <MCRodriguez@dfg.ca.gov>, <Pete_Sorensen@fws.gov>, <Shelley_Ellis@ca.blm.gov>
Subject RE: 2010 Proposed Desert Tortoise Protocol for the Blythe Palen and Ridgecrest Solar Power Project sites

We've had tortoise activity at the Blythe site (tracks fresh enough to see scale impressions) and the temperatures have been warm through the weekend. We will be checking the known tortoise locations at Blythe for evidence of activity tomorrow (Sunday March 14th) and if we note activity and temperatures are sufficiently warm on Monday and through next week, we anticipate that we'll begin surveys on Monday (March 15th) and continue as long as temperatures remain warm.

Shelly Ellis sent an email sayign that some tortoises have been out, but returned to their burrows, so it may be still too cold. We will be going to Ridgecrest in late March to map burrows for Phase II of the burrowing owl surveys and will check known tortoise locations for tortoise activity at that time. If we note that several tortoises are active and the temperatures are warm, we anticipate beginning surveys around March 27.

From: Larry_LaPre@ca.blm.gov [mailto:Larry_LaPre@ca.blm.gov]
Sent: Thu 3/11/2010 9:06 AM
To: Dayman, Shelly
Cc: cweightman@dfg.ca.gov; Danielle_Dillard@fws.gov; DHACKER@dfg.ca.gov; Copley, Elizabeth; Riley, Erin; Felicia_Sirchia@fws.gov; Harron@solarmillennium.com; Holly_Roberts@blm.gov; Edson, Leo; Mark_Massar@ca.blm.gov; MCRodriguez@dfg.ca.gov; Pete_Sorensen@fws.gov; Shelley_Ellis@ca.blm.gov
Subject: 2010 Proposed Desert Tortoise Protocol for the Blythe Palen and Ridgecrest Solar Power Project sites

The forecast looks pretty good for next week, even though it has been below 70 this week along the I-10 corridor. The first emergence period for desert tortoises should be a really good time to be out there.

I don't know about the Ridgecrest area, but suggest keeping in touch with Shelley Ellis, biologist in the Ridgecrest Office.

Dr. Larry LaPre
District Wildlife Biologist
California Desert District
Bureau of Land Management
22835 Calle San Juan de los Lagos
Moreno Valley, CA 92553
Phone: (951) 697-5218
Fax: (951) 697-5299
E-mail: llapre@ca.blm.gov

ATTACHMENT 3

INFORMATION INDEX FOR DESERT TORTOISE SIGN

ATTACHMENT 3

INFORMATION INDEX FOR DESERT TORTOISE SIGN
Burrows and Dens, Scats, and Shell Remains

From: USFWS *Field Survey Protocol for any Non-Federal Action That May Occur within the Range of the Desert Tortoise* (USFWS 1992)

1. Burrows and Dens:
   1. currently active, with tortoise or recent tortoise sign
   2. good condition, definitely tortoise; no evidence of recent use
   3. deteriorated condition (please describe); definitely tortoise
   4. deteriorated condition; possibly tortoise (please describe)
   5. good condition; possibly tortoise (please describe)

2. Scats:
   1. wet (not from rain or dew) or freshly dried; obvious odor
   2. dried with glaze; some odor; dark brown
   3. dried; no glaze or odor; signs of bleaching (light brown), tightly packed material
   4. dried; light brown to pale yellow, loose material; scaly appearance
   5. bleached, or consisting only of plant fiber

3. Shell Remains:
   1. fresh or putrid
   2. normal color; scutes adhere to bone
   3. scutes peeling off bone
   4. shell bone is falling apart; growth rings on scutes are peeling
   5. disarticulated and scattered

ATTACHMENT 4

FIELD DATA SHEETS
SPRING 2010

Site: Blythe

DESERT TORTOISE FIELD SURVEY DATA SHEET [redacted] Habitat Assessment

Date: 2/16/10

Page 7 of

Easting Start	Easting End	Map #	Survey-or	GPS (Data)	Additional Surveyors and GPS Units	

	Time	Temp	Wind Sp/Dir	Weather & % Cloud
Start				
Mid-day				
End				

GPS Ident Code	GPS Easting**	GPS Northing**	Species	Comments	CLASS (1-5)	Burrow Suitable for (√=Yes): DT?	Wbo ?	Kfox ?	Badg ?
BLSAD001	0708169	3723708	LOSH	resident, perched, ~~foraging~~ hunting in ironwood					
Potshard	0708097	3723726	pot shard	11 pieces, ~1"x1"					
BLSBH001	0708174	3725341	LOSH	resident, calling (2/11/10)	GPS FC 11				

*See Reverse and Complete Data Sheet for Desert Tortoises for ALL LIVE TORTOISES!!!

**Coordinate Grid, UTM 11N, NAD 83

yellow-rumped warbler
white crowned sparrow
house finch
verdin
black-tailed gnatcatcher
black phoebe

Site: Blythe

DESERT TORTOISE FIELD SURVEY DATA SHEET [redacted] Habitat Assessment

Date: 2/17/10

Easting Start	Easting End	Map #	Survey-or	GPS (Data)	Additional Surveyors and GPS Units	
Habitat Assessment			SDA	15	11-GLU	16-ADA
					PC11-BHA	

	Time	Temp	Wind Sp/Dir	Weather & % Cloud
Start	8:05AM	64°F	0	2%, ground wet in many areas
Mid-day				
End				

GPS Ident Code	GPS Easting**	GPS Northing**	Species	Comments	CLASS (1-5)	Burrow Suitable for (√=Yes): DT?	Wbo ?	Kfox ?	Badg ?
BDPAD001	0707526	3724413	DETO?	plugged potential tort pallet rain event may have plugged - recheck during surveys	4	✓	✗	✗	✗
BDBAD001	0707219	3724755	DETO?	potential DETO burrow,	4?	✓	✓	✗	✗
BDBAD002	0707212	3724752	DETO?	potential tort pallet, collapsed may turn to left	3?	✓	✓	✗	✗
BDCGL001	0707201	3724767	DETO	tortoise vertebral bone fragment eroded	5				
BDBH002	0706954	3724748	DETO	tort burrow, whitewash present tort scat 3 pieces scat 2"x1" outside, scat inside	1		✓	300 mm wide burrow	
—	—	—		→ Deto pallet 3m to west pile of burrow, collapsed burrow 20m to west					
BLSBH002	0706942	3724755	LOSH	flying north					
BDCAD001	0706903	3724756	DETO	9 pieces of bones scattered in wash possibly same animal as PC GLOU. Adult, another piece of plastron 20m to N					
BDCGL002	0706841	3724797	DETO	2 pieces 2"x2" one plastron, one carapace					
BDPAD003			DETO	8" wide x 16" deep on GPS 16	2				

*See Reverse and Complete Data Sheet for Desert Tortoises for ALL LIVE TORTOISES!!!

**Coordinate Grid, UTM 11N, NAD 83

prairie falcon (2 ♂, 1 ♀) - will likely nest on-site

tarantula

gambel's quail

greater roadrunner (tracks)

kit fox carcass

roadrat

mkrat

Site: Blythe

DESERT TORTOISE FIELD SURVEY DATA SHEET [redacted] Habitat Assessment

Date: 2/17/10

Easting Start	Easting End	Map #	Survey-or	GPS (Data)	Additional Surveyors and GPS Units	

	Time	Temp	Wind Sp/Dir	Weather & % Cloud
Start				
Mid-day				
End				

GPS Ident Code	GPS Easting**	GPS Northing**	Species	Comments	CLASS (1-5)	Burrow Suitable for (√=Yes): DT?	Wbo ?	Kfox ?	Badg ?
BDCBH001	0704474	3723820	Deto	Female Adult Carcass. Time of death ~4yrs MCL = 205 mm	3				

*See Reverse and Complete Data Sheet for Desert Tortoises for ALL LIVE TORTOISES!!!

**Coordinate Grid, UTM 11N, NAD 83

- Rock wren

WBO 500' Buffer

Site: Blythe

DESERT TORTOISE FIELD SURVEY DATA SHEET [redacted] ~~Habitat Assessment~~

Date: 3/10/10

Page 1 of ____

Easting Start	Easting End	Map #	Survey-or	GPS (Data)	Additional Surveyors and GPS Units	
			SDA	GTF4	GLM-11	PDA-15
					EGR-PC11	

	Time	Temp	Wind Sp/Dir	Weather & % Cloud
Start	10:15	51°F	3-7mph	0% CC
Mid-day	12:17 PM	67°F	5mph	5% CC
End				

GPS Ident Code	GPS Easting**	GPS Northing**	Species	Comments	CLASS (1-5)	Burrow Suitable for (√=Yes): DT?	Wbo ?	Kfox ?	Badg ?
BDPAD010	0708901	3723546	DETO?	potential DT pallet (caliche) no sign	5	✓	X	X	X
Pt 109 -	~~sheep~~/goats								
BKBAD010	0708842	3725354	KFox	6 collapsed kfox burrows, kfox scat, ~~es~~ stream flowed into burrows,	could check	?	? later	✓ in season	X for WBO
BMAGL000	0707556	3723513	mammal	large burrow entrance, collapsed, may go back further to left, old kit fox scat		✓	3	✓	✓
BDBAD010	0706653	3723525	DT	- tortoise burrow, in caliche, with tracks, DT, 11x15" (wide), very ~~(illegible)~~ deep, several meters, can't see to end + DT pallet 10m to west, cave → scuff marks, 9" wide x 5" high	1	✓	2	low	X

*See Reverse and Complete Data Sheet for Desert Tortoises for ALL LIVE TORTOISES!!!
**Coordinate Grid, UTM 11N, NAD 83

- desert primrose (brown spot!), Camissonia, small flowered poppy (micro?) in bloom
- desert chicory (in bloom), desert lily (in bloom), Abronia velosa (in bloom)
- Zebratail, banded gecko (picture), plantago ovata, Oncaulon (in bloom), cora, tuva
- sufficient herbaceous cover for DT, could ... dove, house finch, CA horned lark

Site: Blyth

DESERT TORTOISE FIELD SURVEY DATA SHEET [redacted] ~~Habitat~~ Assessment

Date: 3/10/10

WBO

Page 2 of

500' buffer

Easting Start	Easting End	Map #	Survey-or	GPS (Data)	Additional Surveyors and GPS Units	

	Time	Temp	Wind Sp/Dir	Weather & % Cloud
Start				
Mid-day				
End				

GPS Ident Code	GPS Easting**	GPS Northing**	Species	Comments	CLASS (1-5)	Burrow Suitable for (√=Yes): DT?	Wbo ?	Kfox ?	Badg ?
GPS #11 BDBAD011	0706668	3723817	DETU	Recently used DETU burrow, cant see end. 11"x6" DETU tracks	1	✓	Potential		
~~BDBAD011~~	0706540	3724197	DT	tort pallet, recently active 10"x7", rock	2	✓	X	X	X
BDBGL010	0706256	3724263	DT	tort burrow with scat, 1/2"x 1/2" no gloss, black, 10"x 6" dead ends	1	✓			
BDCGL010	0706227	3724288	DT	tort carcass, no sheen on scutes, Some scutes still attached, MCL 12½", Some vertebrae inside, ♂, some leg bones	3 → PL N = 10"				
BDPEG001	0705875	3724272	DT	tort pallet, no sign of recent use 9"x5"	5	✓	X	X	X
BDPEG002	0705820	3724247	DT	tort pallet, tort bones, 12"x 6" no recent activity, near mouth, disarticulated	5 → BDCAD010	✓	X	X	X
BDC~~EG001~~AD010	0705822	3724248	DT	disarticulated tort bones @ tort pallet BDPEG002	5				
BDBGL011	0705885	3724673	DT	tort burrow / pallet, 14"x 7"x 22" deep	2	✓	X	X	X
BDBGL012	0705911	3724875	DT	4 tort burrows, 1 pallet, ~~no~~ definitely tort, good cover, no poor sign	2	3			

*See Reverse and Complete Data Sheet for Desert Tortoises for ALL LIVE TORTOISES!!!

**Coordinate Grid, UTM 11N, NAD 83

black throated sparrow, rock wren, winter fat

wild burro

Site: Blythe

DESERT TORTOISE FIELD SURVEY DATA SHEET [redacted] ~~Habitat Assessment~~

Date: 3/10/10

WBO 500'

Page 3 of _____

Easting Start	Easting End	Map #	Survey-or	GPS (Data)	Additional Surveyors and GPS Units	

	Time	Temp	Wind Sp/Dir	Weather & % Cloud
Start				
Mid-day				
End				

GPS Ident Code	GPS Easting**	GPS Northing**	Species	Comments	CLASS (1-5)	Burrow Suitable for (√=Yes): DT?	Wbo ?	Kfox ?	Badg ?
BPOOLAD001	0705826	3725135		Potential Spadefoot Breeding Pool 15' x 3' x 10"					

*See Reverse and Complete Data Sheet for Desert Tortoises for ALL LIVE TORTOISES!!!

**Coordinate Grid, UTM 11N, NAD 83

DESERT TORTOISE FIELD SURVEY DATA SHEET ~~- FOCUSED SURVEY~~ ~~WBO 500' Park~~ WBO 500' Buffer

Site: Blythe Date: 3/19/10 Page 1 of _____

Easting Start	Easting End	Map #	Survey-or	GPS (Data)	Additional Surveyors and GPS Units	

	Time	Temp	Wind Sp/Dir	Weather & % Cloud
Start	10:41 AM	64°F	5 to 13 mph	0% cc
Mid-day				
End				

GPS Ident Code	GPS Easting**	GPS Northing**	Species	Comments	CLASS (1-5)	Burrow Suitable for (√=Yes): DT?	Wbo ?	Kfox ?	Badg ?
BDSSD001	0704452	3726212	DT	DT scat, bleached, loose 2½" x 3/4"	4				
BDLBH001	0704484	3726285	DT	tortoise, live, adult, in burrow 315 mm MCL @ entrance to burrow, resting		✓			
				like BDLBH001 from last year					

*See Reverse and Complete Data Sheet for Desert Tortoises for ALL LIVE TORTOISES!!!
**Coordinate Grid, UTM 11N, NAD 83

Costa's hummingbird

Do not abbreviate

Data Sheet for Live Desert Tortoises

Write on this side only

Located by B Hart
Processed by
Study site name Blythe

Township ..... Range .....
Section ..... Quadrat .....

Coordinates (Reference SW corner)
..... meters North ..... meters East

UTM's ..... n ..... e

Elevation ..... m Accuracy ± ..... m

County ..... State .....

O On Plot O Off Plot

Show location of tortoise in quadrat

Tortoise ID # BDLBH 001
Year first marked .....
Verification of ID ☐
Capture type ..... Sex M
Date (dd/mm/yy) 3/14/10
Time (PST): Start ..... End .....
Frequency ..... Transmitter # .....
Transmitter type .....
Transmitter attached .....
Transmitter to be replaced on .....
PIT # .....

Tortoise Location

Cover site type:
- ☒ burrow
- ☐ pallet
- ☐ shrub
- ☐ caliche cave
- ☐ rock shelter

At cover site:
- ☐ entering
- ☐ exiting
- ☐ on mound
- ☒ inside

Not at cover site:
- ☐ in open
- ☐ other

Burrow Data

ID # .....
Orientation north
Length ..... Height .....
Width 330mm Soil cover caliche
Location area

Survey Type

- O Radio track
- O Burrow search
- O Coverage 1
- O Coverage 2
- O Incidental
- O Other

Tortoise Activity

- ☒ resting
- ☐ basking
- ☐ walking
- ☐ feeding
- ☐ Interacting with other tortoise
- ☐ Interacting with other animals

ID & sex of other tortoise .....
Species .....
Describe interaction:

Plants/items eaten (specific):

Color (shell & skin)

	HV	Hue	Value	Chroma	Color
V1 (center)					
V4 (center)					
LC1,2&V2 (seam)					
LM5,6 & LC2 (seam)					
Foreleg					
Hindleg					

Are you color blind? O Yes ☒ No
Type of blindness .....

Body Measurements

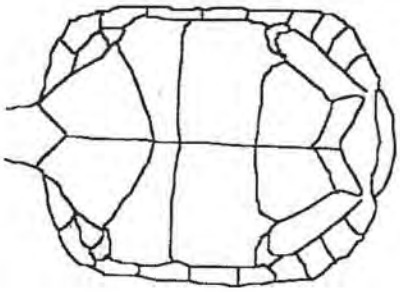
MCL (mm) 315 estimate
PLN (mm) _____
Weight (g) _____
Void (g) _____
Total wt (g) _____

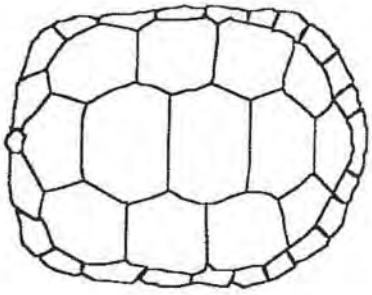
New growth
☐ present ☐ absent

Epoxy #
☐ present ☐ legible

Behavior

sitting just inside burrow





Other notes

Photos; roll ..... frames .....

Draw locations of notches (old and new), chips, and anomalies, etc.
Describe anomalies in numbering of marginals and any identification problems.

Entered by ☐ date ☐ on computer ☐
Modified by ☐ on ☐

© Berry 1997

Do not abbreviate

Health Profile Form for Desert Tortoises

Write on this side only

Located by B Hart
Processed by
Study site name Blythe
Township ..... Range .....
Section ..... Quadrat .....
Coordinates (Reference SW corner)
..... meters North ..... meters East
UTM's ..... n ..... e
County ..... State .....
O On Plot O Off Plot

Show location of tortoise in quadrat

Tortoise ID # BDLBH001
Year first marked
Verification of ID ☐
Capture type ..... Sex M
Date (dd/mm/yy) 3/14/10
Time (PST): Start ..... End .....
Shell wear class
Process time ..... hours
Frequency
Transmitter #

BEAK & NARES

Beak/nares wet	O Yes	O No	O Unk
Beak/nose damp	O Yes	O No	O Unk
Nasal exudate present	O Yes	O No	O Unk
Exudate color	☐ clear ☐ cloudy ☐ white ☐ yellow ☐ green		
Bubble(s) from nares	O Yes	O No	O Unk
One nare occluded	O Yes	O No	O Unk
Both nares occluded	O Yes	O No	O Unk
Dirt on nose/beak	O Yes	O No	O Unk
Dirt in nares	O Yes	O No	O Unk

FORELEGS (adjacent to face)

Dried dirt on forelegs	O Yes	O No	O Unk
Moisture on forelegs	O Yes	O No	O Unk
Dried exud. on scales	O Yes	O No	O Unk
Scales cracking	O Yes	O No	O Unk

BREATHING

Smooth	O Yes	O No	O Unk
Wheezing	O Yes	O No	O Unk
Rasping, clicking	O Yes	O No	O Unk

EYES, CHIN GLANDS Circle eyes or lids:

Eyes/lids whitened or discolored	O Yes	O No	O Unk
Eyelids swollen	O Yes	O No	O Unk
Eyes/lids wet	O Yes	O No	O Unk
Discharge from eyes	O Yes	O No	O Unk
Eyes sunken	O Yes	O No	O Unk
Eyes clear, bright	O Yes	O No	O Unk
Eyes dull, cloudy	O Yes	O No	O Unk
Chin glands draining	O Yes	O No	O Unk

INTEGUMENT

Integument dull	O Yes	O No	O Unk
Integument glossy	O Yes	O No	O Unk
Normal elasticity	O Yes	O No	O Unk
Abnormal skin peeling	O Yes	O No	O Unk

POSTURE/BEHAVIOR

Alert, responsive	O Yes	O No	O Unk
Lethargic	O Yes	O No	O Unk
Can withdraw tightly into shell	O Yes	O No	O Unk
Limbs, head hanging loose	O Yes	O No	O Unk

normal

ORAL CAVITY

Observed	O Yes	O No	O Unk
Discharge present	O Yes	O No	O Unk
Membranes pink	O Yes	O No	O Unk
Membranes pale, white	O Yes	O No	O Unk
Smells/mouth rot	O Yes	O No	O Unk

EVIDENCE OF SHELL DISEASE

Lesions present	O Yes	O No	O Unk
Lesions active	O Yes	O No	O Unk
Lesions healed	O Yes	O No	O Unk
Scute laminae peeling	O Yes	O No	O Unk
Scutes missing/peeling	O Yes	O No	O Unk
Pitting	O Yes	O No	O Unk
Scutes depressed/concave	O Yes	O No	O Unk
Fungal areas	O Yes	O No	O Unk

none noted

EVIDENCE OF TRAUMA

Head	O Yes	O No	O Unk
Gular	O Yes	O No	O Unk
Forelimbs	O Yes	O No	O Unk
Hindlimbs	O Yes	O No	O Unk
Shell	O Yes	O No	O Unk
Scute/bone replacement	O Yes	O No	O Unk

none noted

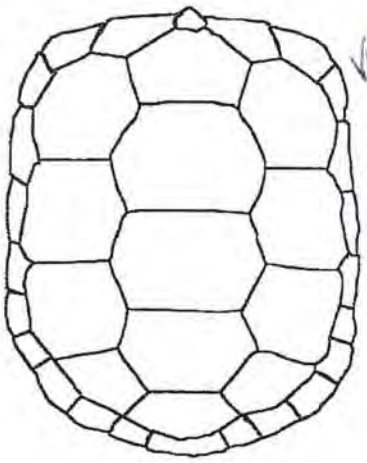
Describe:

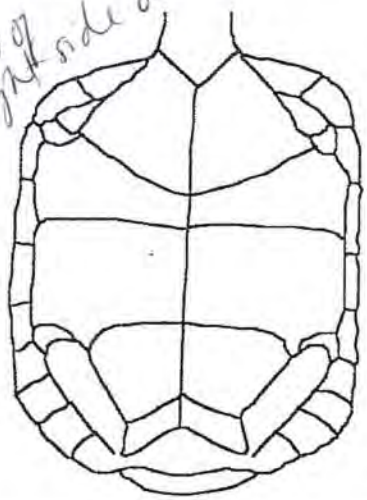
Soil dryness: O wet O damp O dry

Last precipitation (dd/mm/yy)

Urine (vol)
Color
Viscosity
Particulates
Color
Nasal wash collected
Amt. blood/lymph taken (cc)
# of needle sticks
Time (min) of needle sticks
Location
PCV%
Other samples taken
Describe/draw parasites

DRAW: shape of gulars, location of notches; chips, chews, shell damage, lesions; shell disease; shell abnormalities; scute concavities. Make new drawing at least once per year (spring).





view of right side only

Other notes

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3725226
3723610

708230	X	708170	X	708110	X	708050	X	7990	X	707930	X					
8220	X	8160	X	8100	X	8040	X	7980	X							
8210	X	8150	X	8090	X	8030	X	7970	X							
8200	X	8140	X	8080	X	8020	X	7960	X							
8190	X	8130	X	8070	X	8010	X	7950	X							
8180	X	8120	X	8060	X	8000	X	7940	X							

DESERT TORTOISE FIELD SURVEY DATA SHEET - FOCUSED SURVEY

Site: Blythe

Date: 3/15/2010

Page 1 of 1

Easting Start	Easting End	Map #	Survey-or	GPS (Data)	Additional Surveyors and GPS Units	
708230	707930		DT	GTF4	BH 16	GL 11
					AD 15	

	Time	Temp	Wind Sp/Dir	Weather & % Cloud
Start	9:00 AM	66°F	5-11 mph	Clear, 0%
Mid-day	1:00 PM	77°F	2-5 mph	Clear, 5%
End	5:00 PM	77°F	2-9 mph	Clear, 5%

GPS Ident Code	GPS Easting**	GPS Northing**	Species	Comments	CLASS (1-5)	Burrow Suitable for (√=Yes): DT?	Wbo ?	Kfox ?	Badg ?
BMABH002	708227	3724224	MA	unknown burrow type. 1 hole. 200 mm wide. End not seen. Deteriorated.		✓	✓	✓	
BMAAD001	708126	3723695	MA	Looks like old kit fox burrow. 1 burrow Old kit fox scat present		✓	✓	✓	✓
BLSBH003	708026	3723943	LS	Perched in an iron wood. Single bird					
BMADT002	707953	3724381	MA	Round burrow, probably Badger. 1 Opening. End not seen.		✓	✓	✓	✓

*See Reverse and Complete Data Sheet for Desert Tortoises for ALL LIVE TORTOISES!!!
**Coordinate Grid, UTM 11N, NAD 83

DESERT TORTOISE FIELD SURVEY DATA SHEET - FOCUSED SURVEY

Site: Blythe

Date: 3/15/10

Page 1 of _____

Easting Start	Easting End	Map #	Survey-or	GPS (Data)	Additional Surveyors and GPS Units	
-			GLu	11	ADa	15

	Time	Temp	Wind Sp/Dir	Weather & % Cloud
Start	8:54 am	66°F	5-11 mph	5% cc
Mid-day				
End	5:00 pm	77°F	2-4 mph	

GPS Ident Code	GPS Easting**	GPS Northing**	Species	Comments	CLASS (1-5)	Burrow Suitable for (√=Yes): DT?	Wbo ?	Kfox ?	Badg ?
BKBGL001	0708181	3724673	KF	Kit fox complex. 5 openings. old kit fox scat. No Rubow sign. Large burrows.		✓	✓	✓	✓
BDCAD002	0708181	3723923	DT	1 piece tort bone. Likely vertebral 1½cm x 1cm. not mineralized	5				
BKBGL002	0707932	3723649	KF	Kit fox complex. 3 good openings. several collapsed. old kit fox scat. No WBO sign		✓	✓	✓	✓
BKBAD001	0707933	3723835	KF	K. fox burrow complex. 3 openings lots of old K. fox scat. No WBO sign		✓	✓	✓	✓

*See Reverse and Complete Data Sheet for Desert Tortoises for ALL LIVE TORTOISES!!!

**Coordinate Grid, UTM 11N, NAD 83

Le Conte's Thrasher, quail, Loggerhead shrike, long tailed brush lizard, zebra tail

3725980
3725630

705920	X	705980	X	706040	X	706100	X									
5930	X	5990	X	6050	X											
5940	X	6000	X	6060	X											
5950	X	6010	X	6070	X											
5960	X	6020	X	6080	X											
5970	X	6030	X	6090	X											

DESERT TORTOISE FIELD SURVEY DATA SHEET - FOCUSED SURVEY

Site: Blythe

Date: 3/17/2010

Page 1 of 2

Easting Start	Easting End	Map #	Survey-or	GPS (Data)	Additional Surveyors and GPS Units
705920	706100		DT	GTF4	AD SM15
					GL SM11

	Time	Temp	Wind Sp/Dir	Weather & % Cloud
Start	9:20AM	74° F	4-8mph	Clear, 0%
Mid-day	1:45PM	85° F	3-5mph	Clear, 0%
End	4:30 PM	89° F	2-6 mph	Clear, 0%

GPS Ident Code	GPS Easting**	GPS Northing**	Species	Comments	CLASS (1-5)	Burrow Suitable for (√=Yes): DT?	Wbo ?	Kfox ?	Badg ?
BDCGL003	705933	3725592	DT	1.5 - 0.5 in, definitely tortoise, probably adult, 4 pieces, scattered	5				
BDPDT001	705943	3725043	DT	~12 in deep, 12 in. wide, no recent activity, caliche		√			
BMADT003	705972	3724652	MA	Large opening in side of wash, shrinks to ~4x3 in but end not seen. Soil moist. Too much veg cover for WBO.		√			√
BDSGL001	705976	3724660	DT	.5" x .5 tort scat. poo from last season. Likely from subadult. In woodrat nest	3				
BDCGL004	705994	3724846	DT	3 small pieces of tort bone - completely mineralized. dot. tort. Suture lines. Very old. Photos 1-4	5				
BDTAD001	706006	3724622	DT	Tracks in sand, bottom of wash. 9 inches across. Fresh tracks, photos 5-7.					
BDBGL001	705978	3724314	DT	Definitely made by tortoise, currently used by woodrat, end not seen, no evidence of recent tortoise use. 12x6, at least 3-4 ft deep.	3	√		√	√

*See Reverse and Complete Data Sheet for Desert Tortoises for ALL LIVE TORTOISES!!!

**Coordinate Grid, UTM 11N, NAD 83

Am. Raven, Costa's hummingbird, Common side blotched lizard, violet-green swallow, rock wren, black-throated sparrow, black-tailed gnatcatcher, Northern mockingbird, house finch, ash-throated flycatcher, white-crown sparrow

DESERT TORTOISE FIELD SURVEY DATA SHEET - FOCUSED SURVEY

Site: Blythe

Date: 3/17/2010

Easting Start	Easting End	Map #	Survey-or	GPS (Data)	Additional Surveyors and GPS Units	

	Time	Temp	Wind Sp/Dir	Weather & % Cloud
Start				
Mid-day				
End				

GPS Ident Code	GPS Easting**	GPS Northing**	Species	Comments	CLASS (1-5)	Burrow Suitable for (√=Yes): DT?	Wbo ?	Kfox ?	Badg ?
BDBGL002	0705856	3724227	DT	2 large tort burrows. Cant see the end of 1 of them. no signs of recenting	2	✓	✓		
BDBGL003	0705874	3724265	DT	14" x 8" ~ 1.5-2' deep. fresh tortoise tracks. scale marks in dirt. recent use	1	✓	✓	Photos 8-9	
BDBGL001	705882	3724668	DT	Found fresh tracks leading away from BDBGL001. Approx 8 inches wide. Photos 10-11					
BDCAD003	705748	3724731	DT	8x6. carapace and marginals fragment from adult	5				
BDCGL005	0706180	3724657	DT	1 piece tort bone. from adult. slightly mineralized. suture mark	5				

*See Reverse and Complete Data Sheet for Desert Tortoises for ALL LIVE TORTOISES!!!

**Coordinate Grid, UTM 11N, NAD 83

706110	✓	706170	✓	706230		706290		[illegible]							
6120	✓	6180	✓	6240		6300		6360							
6130	✓	6190		6250		6310		6370							
6140	✓	6200		6260		6320		6380							
6150	✓	6210		6270		6330		6390							
6160	✓	6220		6280		6340		6400							

Site: Blythe

DESERT TORTOISE FIELD SURVEY DATA SHEET - FOCUSED SURVEY

Date: 3/18/2010

Page 1 of 1

Easting Start	Easting End	Map #	Survey-or	GPS (Data)	Additional Surveyors and GPS Units	
706110	706180		GLu	11	ADa	15

	Time	Temp	Wind Sp/Dir	Weather & % Cloud
Start	8:29 am	64° F	0-2 mph	5% cc stratus
Mid-day	11:50 am	80° F	2-4 mph	
End				

GPS Ident Code	GPS Easting**	GPS Northing**	Species	Comments	CLASS (1-5)	Burrow Suitable for (√=Yes): DT?	Wbo ?	Kfox ?	Badg ?
BDPAD004	0706183	3724650	DT	def. tort pellet. no signs of recent use 11"x6" ~ 1ft deep	2	✓			
BLSAD001	0706129	3725114	LS	loggerhead shrike doing territorial display.					
BDBGL004	0706136	3725352	DT	8"x4" tort burrow. From scat anomal. Not badly deteriorated. Not active	3	✓			

*See Reverse and Complete Data Sheet for Desert Tortoises for ALL LIVE TORTOISES!!!

**Coordinate Grid, UTM 11N, NAD 83

- Costa's Hummingbird, Chipping Sparrows (migrating), desert iguana, ash throated fly catcher, House Finch, Northern Mockingbird, Greater Roadrunner, Loggerhead shrike, Black throated sparrow, verdin, rock wren, whiptail, side blotched

707930	RK	707870	RK	707810	RK	707750	RK
7920	WV	7860	WV	7800	WV	7740	WV
7910	BH	7850	BH	7790	BH	7730	BH
7900	BH	7840	BH	7780	BH	7720	BH
7890	WV	7830	WV	7770	WV	7710	WV
7880	RK	7820	RK	7760	RK	7700	RK

DESERT TORTOISE FIELD SURVEY DATA SHEET - FOCUSED SURVEY

Site: Blythe Date: 3/18/2010 Page 1 of _____

Easting Start	Easting End	Map #	Surveyor	GPS (Data)	Additional Surveyors and GPS Units	
707930	707700		WV	Sm Garmin D	WV	Sm Garmin E
					JRH	Sm Garmin C

	Time	Temp (ground/air)	Wind Sp/Dir	Weather & % Cloud
Start	0840	65.3/65.3 (89.6)	.7-1.6/NW	Cool & calm/5% C.C.
Mid-day	1235	~~84.6~~/84.6	4.1-5.4/SSE	clear, breeze,
End	1650	98.6/88.5	5.4-6/S	5% cloud, breeze, sunny

GPS Ident Code	GPS Easting**	GPS Northing**	Species	Comments	CLASS (1-5)	Burrow Suitable for (√=Yes): DT?	Wbo ?	Kfox ?	Badg ?
BMAWV001	707918	3723639	MA	7in wide x 5½ in tall. End not visible. Not active. Origin unknown		✓	✓	✓	✓
~~BMARK~~ duplicate find			~~MA~~	~~Origin unknown~~					
BMABH003	707916	3724205	MA	Origin unknown. 7"w x 4"+. Under ~~giant~~ gallerita grass. 15" deep. not active		✓	✓	✓	
BKBRK001	707870	3723789	KB	9 openings. No obvious white wash or pellets. Spread across 12-15 meters.		✓	✓	✓	✓
BDCRK001	707823	3723950	DC	1"x 0.75" bone fragment. Aged, scute sutter line visible. Found in wash. over	5				
BMAWV002	707764	3724324	MA	partially collapsed entrance. remains accessible. 10"w x 8" tall. branch 2 tunnels after entrance			✓	✓	✓
BMABH004	707792	3724308	MA	10"h x 11"w. unknown end. probable badger created. inactive		✓	✓	✓	✓

*See Reverse and Complete Data Sheet for Desert Tortoises for ALL LIVE TORTOISES!!!
**Coordinate Grid, UTM 11N, NAD 83

Ash-throated fly catcher

BDERK001- Time since death = >4 years. * Bone not mineralized.

INFORMATION INDEX FOR DESERT TORTOISE SIGN
Burrows and Dens, Scats, and Shell Remains

(1) Burrows and Dens:
1. currently active, with tortoise or recent tortoise sign
2. good condition, definitely tortoise; no evidence of recent use
3. deteriorated condition (please describe); definitely tortoise
4. deteriorated condition; possibly tortoise (please describe)
5. good condition; possibly tortoise (please describe)

(2) Scats:
1. wet (not from rain or dew) or freshly dried; obvious odor
2. dried with glaze; some odor; dark brown
3. dried; no glaze or odor; signs of bleaching (light brown), tightly packed material
4. dried; light light brown to pale yellow, loose material; scaly appearance
5. bleached, or consisting only of plant fiber

(3) Shell Remains:
1. fresh or putrid
2. normal color; scutes adhere to bone
3. scutes peeling off bone
4. shell bone is falling apart; growth rings on scutes are peeling
5. disarticulated and scattered

GPS and Field Note Nomenclature**

Eg. PDLSD001

P=Site Identifier, DL=live desert tortoise, SD=surveyor identifier (SD=Shelly Dayman), 001=observation #

Site Identifier Blythe=B Palen=P Ridgecrest=R

Species Identification Codes

Herps and Desert Tortoise	BB=burrow	**Bird Species (continued)**	**Mammals**
DL=desert tortoise live	BF=feather	NH=northern harrier, NN=nest	KB=kit fox burrow
DB=burrow	BP=pellets	BT=Bendire's thrasher, BN=nest	GL=American badger live
DS=scat	BO=other (describe)	CT=Crissal's thrasher, CN=nest	GB=American badger burrow
DC=carcass	**Bird Species**	GF=Gilded flicker, GN=nest	ML=Mojave ground squirrel live
DT=tracks	WK=White-tailed kite, KN=nest	GW=Gila Woodpecker, WN=nest	SL=big horn sheep live
DP=desert tortoise pallet	CO=Cooper's hawk, ON=nest	PR=prairie falcon, RN=nest	SC=big horn sheep carcass
DO=other (describe)	SW=Swainson's hawk, SN=nest	PE=peregrine falcon, PN=nest	SS=big horn sheep scat
Other Herps	FE=Ferruginous hawk, FN=nest	NE=unknown bird nest	BA=bat roosting sites
MF=Mojave fringe-toed lizard	GE=golden eagle, EN=nest		OO=other, specify in notes
Birds and Burrowing Owl	LS=loggerhead shrike, LN=nest		MA=mammal burrow
BL=burrowing owl live	LT=Le Conte's thrasher, HN=nest		BC=barrel cactus

Comments Needed***

1. **Burrows and Dens** -Type (burrow, pallet), location (under bush etc.), width, length, depth, other sign present
2. **Scats** – number and estimated size of scat
3. **Shell Remains** – record MCL (carapace length at midline) and PLN (plastron length), note any chips or shell anomalies
4. **Live Tortoises** – Complete Data Sheet for Live Tortoises and Health Profile Form for Desert Tortoises for ALL LIVE TORTOISES

BMAUV001

6190	✓	6250	✓												
6200	✓	6260	✓												
6210	✓	6270													
6220	✓	6280													
6230	✓	6290													
6240	✓	6300													

DESERT TORTOISE FIELD SURVEY DATA SHEET - FOCUSED SURVEY

Site: Blythe Date: 3/19/10 Page i of _____

Easting Start	Easting End	Map #	Survey-or	GPS (Data)	Additional Surveyors and GPS Units	
706190			SDA	#15	GLU	11
						Data

	Time	Temp	Wind Sp/Dir	Weather & % Cloud
Start	8:53 AM	69.7°F	7 to 18 mph	10% CC
Mid-day	2:25 PM	83°F	30 mph	0% CC
End				

GPS Ident Code	GPS Easting**	GPS Northing**	Species	Comments	CLASS (1-5)	Burrow Suitable for (√=Yes): DT?	Wbo ?	Kfox ?	Badg ?
BDCSD001	0706190	3724882	DT	juvenile DT, piece of carcass, ~5yr old DT marginals, one scute attached (sheen) 2"x1"	3?				
BDSGL002	0706201	3724461	DT	tortoise scat, 1¼" long x ½" wide bleached, loose	5				
BDOSD001	0706216	3725378		within drainage, ending (before) of pooling earlier in season potential pool site for Couch's spadefoot					
BDCGL006	0706246	3725282	DT?	Tortoise / turtle fossil, marginals, plastron 2 or fragments, adult carapace	5				
BDCSD002	0706227	3725118	DT	one piece of DT bone fragment, beginning to mineralize 3/4" x 1/2"	5				
BDOGL001	0706235	3724510	DT	small piece of tortoise egg shell fragment, found in drainage, not near burrow					
BDPGL001	0706244	3724499	DT	potential tortoise pallet, caliche, good condition, no evidence of use	5				
BDLGL001	0706256	3724462	tortoise	adult male tortoise, in drainage @ entrance to burrow, under large creosote	shell, see	very worn & pecked datasheets		13" MCL	
BDBGL005	0706260	3724458	DT	occupied tortoise burrow, BDLGL001 present @ entrance	1				

*See Reverse and Complete Data Sheet for Desert Tortoises for ALL LIVE TORTOISES!!!
**Coordinate Grid, UTM 11N, NAD 83

- sidewinder
- DT burrows may be deep under palo verdes/ironwoods and not able to detect

Do not abbreviate

Data Sheet for Live Desert Tortoises

Write on this side only

Located by G Lukacek
Processed by
Study site name Blythe

Township ..... Range .....
Section ..... Quadrat .....

Coordinates (Reference SW corner)
..... meters North ..... meters East

UTM's 0746256 n 3724462 e

Elevation ..... m Accuracy ± ..... m

County ..... State .....

O On Plot O Off Plot temp (ground) 87.5°F

Show location of tortoise in quadrat

Tortoise ID # BDLGL001
Year first marked
Verification of ID ☐
Capture type ..... Sex M
Date (dd/mm/yy) 3/19/10
Time (PST): Start 1:12pm End .....
Frequency ..... Transmitter # .....
Transmitter type .....
Transmitter attached .....
Transmitter to be replaced on .....
PIT # .....

Tortoise Location

Cover site type:
- ☒ burrow
- ☐ pallet
- ☐ shrub
- ☐ caliche cave
- ☐ rock shelter

At cover site:
- ☐ entering
- ☒ exiting
- ☐ on mound
- ☐ inside

Not at cover site:
- ☐ in open
- ☐ other

~~roots like pallet~~ ~~could see tortoise head~~

Burrow Data

ID # BDBGL005
Orientation North straight back couldn't see to end
Length 14" Height .....
Width ..... Soil cover .....
Location ~~Hugh creosote~~ in drainage, very difficult to see

Survey Type

- O Radio track
- O Burrow search
- O Coverage 1
- O Coverage 2
- O Incidental
- O Other

Tortoise Activity

- ☒ resting
- ☐ basking
- ☐ walking
- ☐ feeding
- ☐ Interacting with other tortoise
- ☐ Interacting with other animals

ID & sex of other tortoise .....
Species .....

Describe interaction: burrow

Plants/items eaten (specific):

Color (shell & skin)

	HV	Hue	Value	Chroma	Color
V1 (center)					
V4 (center)					
LC1,2&V2 (seam)					
LM5,6 & LC2 (seam)					
Foreleg					
Hindleg					

Are you color blind? O Yes ☒ No
Type of blindness .....

Body Measurements

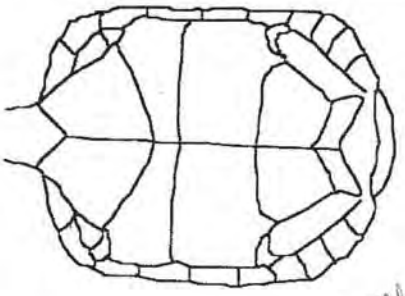
MCL (mm) 13" (estimated) ~~cm~~
PLN (mm) _____
Weight (g) _____
Void (g) _____
Total wt (g) _____

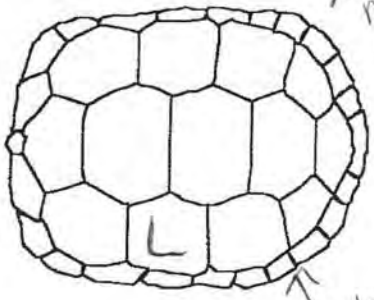
New growth
☐ present ☐ absent

Epoxy #
☐ present ☐ legible

Behavior

tortoise did not withdraw into shell beak w/ food stains





some side marginals concave, top vertebrals sunken in

a lot of wear on shell

Other notes

- short rear toenails, flared ~~ear~~ rear marginals, swollen chin glands
- shell extremely worn

Photos; roll ..... frames .....

Draw locations of notches (old and new), chips, and anomalies, etc.
Describe anomalies in numbering of marginals and any identification problems.

Entered by ☐ date ☐ ☐ on computer ☐
Modified by ☐ on ☐

© Berry 1997

Do not abbreviate

Health Profile Form for Desert Tortoises

Write on this side only

Located by G Lukwell
Processed by
Study site name Blythe
Township ..... Range .....
Section ..... Quadrat .....

Coordinates (Reference SW corner)
..... meters North ..... meters East

UTM's 0706256 n 3724462 e
County Riverside State CA

O On Plot O Off Plot

Show location of tortoise in quadrat

Tortoise ID # BDLGL001
Year first marked
Verification of ID ☐
Capture type ..... Sex M
Date (dd/mm/yy) 3/19/10
Time (PST): Start 1:12pm End
Shell wear class
Process time ..... hours
Frequency
Transmitter #

BEAK & NARES

Beak/nares wet	~~O Yes~~	O No	O Unk
Beak/nose damp	O Yes	O No	O Unk
Nasal exudate present	O Yes	O No	O Unk

recent feeding

Exudate color ☐ clear ☐ cloudy ☐ white ☐ yellow ☐ green

Bubble(s) from nares	O Yes	O No	O Unk
One nare occluded	O Yes	O No	O Unk
Both nares occluded	O Yes	O No	O Unk
Dirt on nose/beak	O Yes	O No	O Unk
Dirt in nares	O Yes	O No	O Unk

FORELEGS (adjacent to face)

Dried dirt on forelegs	O Yes	O No	O Unk
Moisture on forelegs	O Yes	O No	O Unk
Dried exud. on scales	O Yes	O No	O Unk
Scales cracking	O Yes	O No	O Unk

BREATHING

Smooth	O Yes	O No	O Unk
Wheezing	O Yes	O No	O Unk
Rasping, clicking	O Yes	O No	O Unk

EYES, CHIN GLANDS Circle eyes or lids:

Eyes/lids whitened or discolored	O Yes	O No	O Unk
Eyelids swollen	O Yes	O No	O Unk
Eyes/lids wet	O Yes	O No	O Unk
Discharge from eyes	O Yes	O No	O Unk
Eyes sunken	O Yes	O No	O Unk
Eyes clear, bright	O Yes	O No	O Unk
Eyes dull, cloudy	O Yes	O No	O Unk
Chin glands draining	O Yes	O No	O Unk

INTEGUMENT

Integument dull	O Yes	O No	O Unk
Integument glossy	O Yes	O No	O Unk
Normal elasticity	O Yes	O No	O Unk
Abnormal skin peeling	O Yes	O No	O Unk

POSTURE/BEHAVIOR

Alert, responsive	O Yes	O No	O Unk
Lethargic	O Yes	O No	O Unk
Can withdraw tightly into shell	O Yes	O No	O Unk
Limbs, head hanging loose	O Yes	O No	O Unk

ORAL CAVITY

Observed	O Yes	~~O No~~	O Unk
Discharge present	O Yes	O No	O Unk
Membranes pink	O Yes	O No	O Unk
Membranes pale, white	O Yes	O No	O Unk
Smells/mouth rot	O Yes	O No	O Unk

EVIDENCE OF SHELL DISEASE

Lesions present	O Yes	O No	O Unk
Lesions active	O Yes	O No	O Unk
Lesions healed	O Yes	O No	O Unk
Scute laminae peeling	O Yes	O No	O Unk
Scutes missing/peeling	O Yes	O No	O Unk
Pitting	O Yes	O No	O Unk
Scutes depressed/concave	O Yes	O No	O Unk
Fungal areas	O Yes	O No	O Unk

EVIDENCE OF TRAUMA

Head	O Yes	O No	O Unk
Gular	O Yes	O No	O Unk
Forelimbs	O Yes	O No	O Unk
Hindlimbs	O Yes	O No	O Unk
Shell	O Yes	O No	O Unk
Scute/bone replacement	O Yes	O No	O Unk

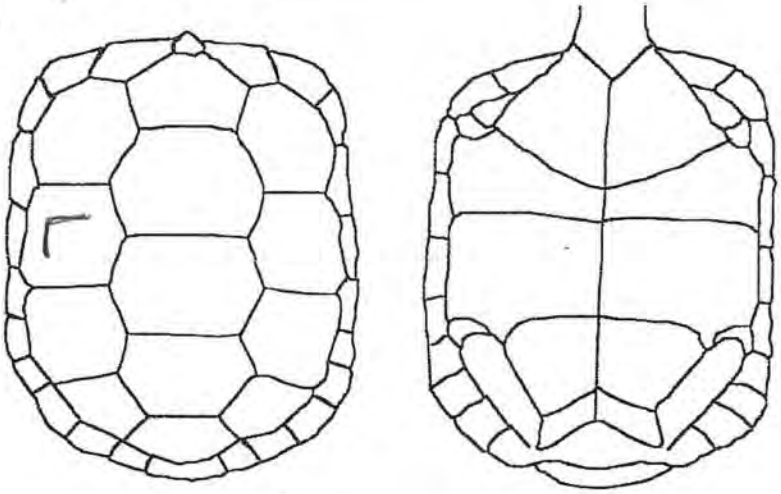
Describe:

Soil dryness: O wet O damp O dry

Last precipitation (dd/mm/yy)

Urine (vol)
Color
Viscosity
Particulates
Color
Nasal wash collected
Amt. blood/lymph taken (cc)
# of needle sticks
Time (min) of needle sticks
Location
PCV%
Other samples taken
Describe/draw parasites

DRAW: shape of gulars, location of notches; chips, chews, shell damage, lesions; shell disease; shell abnormalities; scute concavities. Make new drawing at least once per year (spring).



Other notes

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707690	RK	707630	RK	707570	RK	707510	RK	707450	RK								
7680	WV	7620	WV	560	WV	500 440	WV	440	WV								
7670	BH	7610	BH	550	BH	490 430	BH	430	BH								
7660	BH	7600	BH	540	BH	480 420	BH	420	BH								
7650	WV	7590	WV	530	WV	470 460	WV	410	WV								
7640	RK	7580	RK	520	RK	460 450	RK	400	RK								

Site: Blythe

DESERT TORTOISE FIELD SURVEY DATA SHEET - FOCUSED SURVEY

Date: 3/19/2010

Page 1 of 1

Easting Start	Easting End	Map #	Survey-or	GPS (Data)	Additional Surveyors and GPS Units	
707690	707400		WV	Sm Garmin D	JBH	Sm Garmin C
					WV	Garmin E

Air / Ground

	Time	Temp	Wind Sp/Dir	Weather & % Cloud
Start	0800	68.0/66.2	8.7-12.2/NW	30% cc.
Mid-day	1300	80.6/87.8	18.3-21.8/NW	0% c.c.
End	1600	85.0/86.0	14.0-15.5/NW	0% cc

GPS Ident Code	GPS Easting**	GPS Northing**	Species	Comments	CLASS (1-5)	Burrow Suitable for (√=Yes): DT?	Wbo ?	Kfox ?	Badg ?
BMARK001	707639	3724199	MA	8"wx6"h. ~~Unknown depth~~ 18" deep		✓	✓	✓	✓
BDPAD001 → Known waypoint, See notes on Back.									
BPAD003 → Known waypoint			DP(?)	-Should be DB, could completely cover animal (see back)	4	✓	✓	✓	✓
BKBBH001	707431	3724338		9"wx8"h. evidence of canid digging. kit fox scat ~~on~~ at opening. one opening.		✓	✓	✓	✓
BMA ~~BH~~KB002	707435	3724188		active. fresh scat in front. disturbed soil. 9"wx5"h. in bank of wash		✓	✓	✓	✓
BMARK002	707403	3724199		collapsed. shallow spoils. 12"wx8"h. 24" deep. potential DT origin, inconclusive		✓	✓	✓	✓

*See Reverse and Complete Data Sheet for Desert Tortoises for ALL LIVE TORTOISES!!!

**Coordinate Grid, UTM 11N, NAD 83

707440 ~~3725185~~ easting to head north on 3/20

BDPAD001: No longer a pallet. Collapsed burrow (?) w/ annual veg. all around (including front -- old entrance.). No sign of Desert Tortoise at this location. Brooke Hart 3/19/2010

INFORMATION INDEX FOR DESERT TORTOISE SIGN
Burrows and Dens, Scats, and Shell Remains

(1) Burrows and Dens:

1. currently active, with tortoise or recent tortoise sign
2. good condition, definitely tortoise; no evidence of recent use
3. deteriorated condition (please describe); definitely tortoise
4. deteriorated condition; possibly tortoise (please describe)
5. good condition; possibly tortoise (please describe)

BDPAD003: Has the general tortoise shape. Dilapated, inactive condition makes origin of burrow hard to determine. Possibly tortoise.

(2) Scats:

1. wet (not from rain or dew) or freshly dried; obvious odor
2. dried with glaze; some odor; dark brown
3. dried; no glaze or odor; signs of bleaching (light brown), tightly packed material
4. dried; light light brown to pale yellow, loose material; scaly appearance
5. bleached, or consisting only of plant fiber

(3) Shell Remains:

1. fresh or putrid
2. normal color; scutes adhere to bone
3. scutes peeling off bone
4. shell bone is falling apart; growth rings on scutes are peeling
5. disarticulated and scattered

GPS and Field Note Nomenclature**

Eg. PDLSD001

P=Site Identifier, DL=live desert tortoise, SD=surveyor identifier (SD=Shelly Dayman), 001=observation #

Site Identifier Blythe=B Palen=P Ridgecrest=R

Species Identification Codes

Herps and Desert Tortoise	BB=burrow	**Bird Species (continued)**	**Mammals**
DL=desert tortoise live	BF=feather	NH=northern harrier, NN=nest	KB=kit fox burrow
DB=burrow	BP=pellets	BT=Bendire's thrasher, BN=nest	GL=American badger live
DS=scat	BO=other (describe)	CT=Crissal's thrasher, CN=nest	GB=American badger burrow
DC=carcass	**Bird Species**	GF=Gilded flicker, GN=nest	ML=Mojave ground squirrel live
DT=tracks	WK=White-tailed kite, KN=nest	GW=Gila Woodpecker, WN=nest	SL=big horn sheep live
DP=desert tortoise pallet	CO=Cooper's hawk, ON=nest	PR=prairie falcon, RN=nest	SC=big horn sheep carcass
DO=other (describe)	SW=Swainson's hawk, SN=nest	PE=peregrine falcon, PN=nest	SS=big horn sheep scat
Other Herps	FE=Ferruginous hawk, FN=nest	NE=unknown bird nest	BA=bat roosting sites
MF=Mojave fringe-toed lizard	GE=golden eagle, EN=nest		OO=other, specify in notes
Birds and Burrowing Owl	LS=loggerhead shrike, LN=nest		MA=mammal burrow
BL=burrowing owl live	LT=Le Conte's thrasher, HN=nest		BC=barrel cactus

Comments Needed***

1. **Burrows and Dens** -Type (burrow, pallet), location (under bush etc.), width, length, depth, other sign present
2. **Scats** – number and estimated size of scat
3. **Shell Remains** – record MCL (carapace length at midline) and PLN (plastron length), note any chips or shell anomalies
4. **Live Tortoises** – Complete Data Sheet for Live Tortoises and Health Profile Form for Desert Tortoises for ALL LIVE TORTOISES

6190	✓	6250	✓												
6200	✓	6260	✓												
6210	✓	6270													
6220	✓	6280													
6230	✓	6290													
6240	✓	6300													

DESERT TORTOISE FIELD SURVEY DATA SHEET - FOCUSED SURVEY

Site: Blythe Date: 3/19/10 Page i of _____

Easting Start	Easting End	Map #	Survey-or	GPS (Data)	Additional Surveyors and GPS Units	
706190			SDA	#15	GLU	11
						Data

	Time	Temp	Wind Sp/Dir	Weather & % Cloud
Start	8:53 AM	69.7°F	7 to 18 mph	10% CC
Mid-day	2:25 PM	83°F	30 mph	0% CC
End				

GPS Ident Code	GPS Easting**	GPS Northing**	Species	Comments	CLASS (1-5)	Burrow Suitable for (√=Yes): DT?	Wbo ?	Kfox ?	Badg ?
BDCSD001	0706190	3724882	DT	juvenile DT, piece of carcass, ~5yr old DT marginals, one scute attached (sheen) 2"x1"	3?				
BDSGL002	0706201	3724461	DT	tortoise scat, 1¼" long x ½" wide bleached, loose	5				
BDOSD001	0706216	3725378		within drainage, evidence (picture) of pooling earlier in season potential pool site for Couch's spadefoot					
BDCGL006	0706246	3725282	DT?	Tortoise/turtle fossil, marginals, plastron 20+ fragments, adult, carapace	5				
BDCSD002	0706227	3725118	DT	one piece of DT bone fragment, beginning to mineralize 3/4" x 1/2"	5				
BDOGL001	0706235	3724510	DT	small piece of tortoise egg shell fragment, found in drainage, not near burrow					
BDPGL001	0706244	3724499	DT	potential tortoise pallet, caliche, good condition, no evidence of use	5				
BDLGL001	0706256	3724462	tortoise	adult male tortoise, in drainage @ entrance to burrow, under large creosote	shell, see	very worn & pealing datasheets		13" MCL	
BDBGL005	0706260	3724458	DT	occupied tortoise burrow, BDLGL001 present @ entrance	1				

*See Reverse and Complete Data Sheet for Desert Tortoises for ALL LIVE TORTOISES!!!
**Coordinate Grid, UTM 11N, NAD 83

- sidewinder
- DT burrows may be deep under palo verdes/ironwoods and not able to detect

Do not abbreviate

Data Sheet for Live Desert Tortoises

Write on this side only

Located by G Lukacek
Processed by
Study site name Blythe

Township ..... Range .....
Section ..... Quadrat .....

Coordinates (Reference SW corner)
..... meters North ..... meters East

UTM's 0706256 n 3724462 e

Elevation ..... m Accuracy ± ..... m

County ..... State .....

O On Plot O Off Plot temp (ground) 87.5°F

Show location of tortoise in quadrat

Tortoise ID # BDLGL001
Year first marked
Verification of ID ☐
Capture type ..... Sex M
Date (dd/mm/yy) 3/19/10
Time (PST): Start 1:12pm End .....
Frequency ..... Transmitter # .....
Transmitter type .....
Transmitter attached .....
Transmitter to be replaced on .....
PIT # .....

Tortoise Location

Cover site type:
- ☒ burrow
- ☐ pallet
- ☐ shrub
- ☐ caliche cave
- ☐ rock shelter

At cover site:
- ☐ entering
- ☒ exiting
- ☐ on mound
- ☐ inside

Not at cover site:
- ☐ in open
- ☐ other

~~tools like pallet~~ ~~could see tortoise~~

Burrow Data

ID # BDBGL005
Orientation North straight back could not see to end
Length ..... Height .....
Width 14" Soil cover .....
Location ~~under creosote~~, in drainage, very difficult to see

Survey Type

- O Radio track
- O Burrow search
- O Coverage 1
- O Coverage 2
- O Incidental
- O Other

Tortoise Activity

- ☒ resting
- ☐ basking
- ☐ walking
- ☐ feeding
- ☐ Interacting with other tortoise
- ☐ Interacting with other animals

ID & sex of other tortoise .....
Species .....
Describe interaction: burrow

Plants/items eaten (specific):

Color (shell & skin)

	HV	Hue	Value	Chroma	Color
V1 (center)					
V4 (center)					
LC1,2&V2 (seam)					
LM5,6 & LC2 (seam)					
Foreleg					
Hindleg					

Are you color blind? O Yes ☒ No
Type of blindness .....

Body Measurements

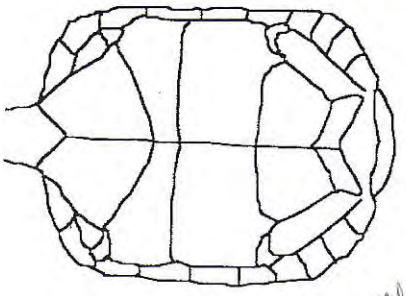
MCL (mm) 13" (estimated) ~~CCL~~
PLN (mm) _____
Weight (g) _____
Void (g) _____
Total wt (g) _____

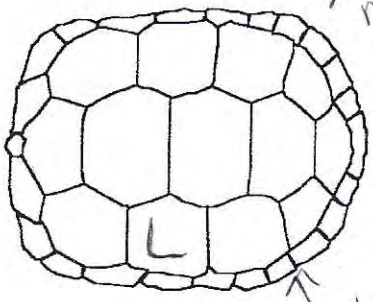
New growth
☐ present ☐ absent

Epoxy #
☐ present ☐ legible

Behavior

tortoise did not withdraw into shell
beak w/ food stains





some side marginals concave, top vertebrals sunken in

a lot of wear on shell

Other notes

- short rear toenails, flared rear marginals, swollen chin glands
- shell extremely worn

Photos; roll ..... frames .....

Draw locations of notches (old and new), chips, and anomalies, etc.
Describe anomalies in numbering of marginals and any identification problems.

Entered by ☐ date ☐ on computer ☐
Modified by ☐ on ☐

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Do not abbreviate

Health Profile Form for Desert Tortoises

Write on this side only

Located by: G Lukowski
Processed by:
Study site name: Blythe
Township: Range:
Section: Quadrat:
Coordinates (Reference SW corner)
meters North: meters East:
UTM's: 0706256 n 3724462 e
County: Riverside State: CA
O On Plot O Off Plot

Show location of tortoise in quadrat

Tortoise ID #: BDLGL001
Year first marked:
Verification of ID: ☐
Capture type: Sex: M
Date (dd/mm/yy): 3/19/10
Time (PST): Start: 1:12pm End:
Shell wear class:
Process time: hours
Frequency:
Transmitter #:

BEAK & NARES

Beak/nares wet	✓ Yes	✓ No (recent feeding)	O Unk
Beak/nose damp	O Yes	✓ No	O Unk
Nasal exudate present	O Yes	✓ No	O Unk

Exudate color: ☐ clear ☐ cloudy ☐ white ☐ yellow ☐ green

Bubble(s) from nares	O Yes	✓ No	O Unk
One nare occluded	O Yes	✓ No	O Unk
Both nares occluded	O Yes	✓ No	O Unk
Dirt on nose/beak	O Yes	✓ No	O Unk
Dirt in nares	O Yes	✓ No	O Unk

FORELEGS (adjacent to face)

Dried dirt on forelegs	O Yes	✓ No	O Unk
Moisture on forelegs	O Yes	✓ No	O Unk
Dried exud. on scales	O Yes	✓ No	O Unk
Scales cracking	O Yes	✓ No	O Unk

BREATHING

Smooth	O Yes	✓ No	O Unk
Wheezing	O Yes	✓ No	O Unk
Rasping, clicking	O Yes	✓ No	O Unk

EYES, CHIN GLANDS Circle eyes or lids:

Eyes/lids whitened or discolored	O Yes	✓ No	O Unk
Eyelids swollen	O Yes	✓ No	O Unk
Eyes/lids wet	O Yes	✓ No	O Unk
Discharge from eyes	O Yes	✓ No	O Unk
Eyes sunken	O Yes	✓ No	O Unk
Eyes clear, bright	O Yes	✓ No	O Unk
Eyes dull, cloudy	O Yes	✓ No	O Unk
Chin glands draining	O Yes	✓ No	O Unk

INTEGUMENT

Integument dull	O Yes	✓ No	O Unk
Integument glossy	✓ Yes	O No	O Unk
Normal elasticity	✓ Yes	O No	O Unk
Abnormal skin peeling	O Yes	O No	O Unk

POSTURE/BEHAVIOR

Alert, responsive	O Yes	O No	O Unk
Lethargic	O Yes	O No	O Unk
Can withdraw tightly into shell	O Yes	O No	O Unk
Limbs, head hanging loose	O Yes	O No	O Unk

ORAL CAVITY

Observed	O Yes	✓ No	O Unk
Discharge present	O Yes	✓ No	O Unk
Membranes pink	O Yes	✓ No	O Unk
Membranes pale, white	O Yes	✓ No	O Unk
Smells/mouth rot	O Yes	✓ No	O Unk

EVIDENCE OF SHELL DISEASE

Lesions present	O Yes	✓ No	O Unk
Lesions active	O Yes	✓ No	O Unk
Lesions healed	O Yes	✓ No	O Unk
Scute laminae peeling	O Yes	✓ No	O Unk
Scutes missing/peeling	O Yes	✓ No	O Unk
Pitting	O Yes	✓ No	O Unk
Scutes depressed/concave	O Yes	✓ No	O Unk
Fungal areas	O Yes	✓ No	O Unk

EVIDENCE OF TRAUMA

Head	O Yes	✓ No	O Unk
Gular	O Yes	✓ No	O Unk
Forelimbs	O Yes	✓ No	O Unk
Hindlimbs	O Yes	✓ No	O Unk
Shell	O Yes	✓ No	O Unk
Scute/bone replacement	O Yes	✓ No	O Unk

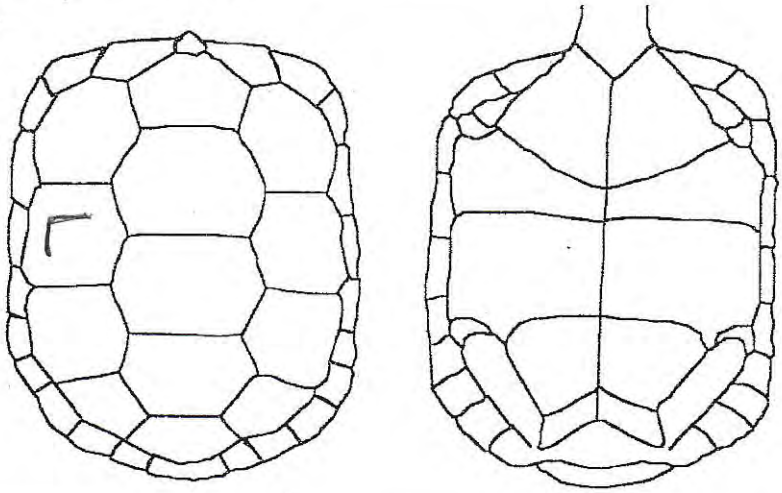
Describe:

Soil dryness: O wet ✓ damp O dry

Last precipitation (dd/mm/yy)

Urine (vol)
Color
Viscosity
Particulates
Color
Nasal wash collected
Amt. blood/lymph taken (cc)
# of needle sticks
Time (min) of needle sticks
Location
PCV%
Other samples taken
Describe/draw parasites

DRAW: shape of gulars, location of notches; chips, chews, shell damage, lesions; shell disease; shell abnormalities; scute concavities. Make new drawing at least once per year (spring).



Other notes

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0706270	✓	6330	✓												
6280	✓	6340	✓												
6290	✓	6350	✓												
6300	✓	6360	✓												
6310	✓	6370	✓												
6320	✓	6380	✓												

2 ✓

DESERT TORTOISE FIELD SURVEY DATA SHEET - FOCUSED SURVEY

Site: Blythe Date: 3/20/10 Page 1 of 2

Easting Start	Easting End	Map #	Survey-or	GPS (Data)	Additional Surveyors and GPS Units
706270	706380		SDA	SMIT	GLU-11 DTE-CTFA

	Time	Temp	Wind Sp/Dir	Weather & % Cloud
Start	8:52AM	68°F	3 to 12 mph	2% CS
Mid-day				
End				

GPS Ident Code	GPS Easting**	GPS Northing**	Species	Comments	CLASS (1-5)	Burrow Suitable for (√=Yes): DT?	Wbo ?	Kfox ?	Badg ?
BDPSD001	0706263	3725329	DT	potential DT pallet in caliche 9"×6", veg @ entrance	4	✓	X	X	X
BDPDT002	0706277	3725325	DT	very open caliche, potential DT pallet, 12"×6"	4	✓	X	X	X
BDCSD003	0706269	3725169	DT	tortoise bone fragment, mineralized, marginal	5				
BOOSD002	0706269	3725169	pool	~~pond~~ evidence of ponding, some clay in soils, might support couch's spadefoot					
BDPGL002	0706289	3725170	DT	potential DT pallet, caliche, no evidence of use	5				
BDCSD004	0706275	3724830	DT	tortoise bone fragment, starting to mineralize, marginal, adult	5	→	from plastron		
BDPGL003	0706293	3724461	DT	Potential tortoise pallet 10" wide x 7" tall, in wash	5				
-checked BDLGL001, out of burrow coming out from under Creosote, no guular ●, green mouth, tort basking → female?									
BBODT001	0706297	3725242	WBO	burrowing owl white wash, two collapsed burrows, ww on hand out		X	X	← collapsed X	X
BDPGL004	0706350	4724601	DT	potential tortoise pallet, caliche 7"×6", 1½' deep	5				

*See Reverse and Complete Data Sheet for Desert Tortoises for ALL LIVE TORTOISES!!!

**Coordinate Grid, UTM 11N, NAD 83

- desert horned lizard, western whiptail

60	✓															
70	✓															
80	✓															

30

DESERT TORTOISE FIELD SURVEY DATA SHEET - FOCUSED SURVEY

Site: Blythe Date: 3/20/10 Page 2 of 2

Easting Start	Easting End	Map #	Survey-or	GPS (Data)	Additional Surveyors and GPS Units	
			SDA		GLU	
					DTE	

	Time	Temp	Wind Sp/Dir	Weather & % Cloud
Start				
Mid-day				
End				

GPS Ident Code	GPS Easting**	GPS Northing**	Species	Comments	CLASS (1-5)	Burrow Suitable for (√=Yes): DT?	Wbo ?	Kfox ?	Badg ?
BDTGL001	0706349	3724466	DT	tortoise (adult) tracks, width from mid foot to mid foot = 8" pictures					
BDLSD001	0706267	3724362	DT	same as BDLGL001, walking fast on dirt pavement male, fat tail	ground temp = 79°F MCL = 12"		PLN = 8½"		
BKBGL003	0706364	3724899	Kitfox	~~two~~ burrows, under creosote, lots of kfox scat → three, fresh kfox scat		✓	✓	✓	✓

*See Reverse and Complete Data Sheet for Desert Tortoises for ALL LIVE TORTOISES!!!

**Coordinate Grid, UTM 11N, NAD 83

- wild burro scat

Northof ~3725200 only

	707440		S.only 707380	JH	707320	JH	707260	JH	709200	JH							
	430		S.only 7370	RK	WV 7310	WV	7250	WV	7190	WV							
	420		7360	JH	7300	WV	7240	WV	7180 S.only	WV							
	410		7350	JH	7290	JH	7230	BH	7170 (S.)	JH							
	400		7340	RK	7280	RK	7220	RK	7160 (S.)	RK							
	S.only 390	WV RK	7330	RK	7270	RK	7210	RK									

DESERT TORTOISE FIELD SURVEY DATA SHEET - FOCUSED SURVEY

Site: Blythe Date: 3/20/2010 Page 1 of 1

Easting Start	Easting End	Map #	Survey-or	GPS (Data)	Additional Surveyors and GPS Units	
707440	707160		JBH	Sm-D	RK	Sm-D
					WV	Sm-E
					JBH	Sm-C

	Time	Temp (Air \ ground)	Wind Sp/Dir	Weather & % Cloud
Start	0800	66.8 \ 61.7	5.0-6.4 / E.NE	0% C.C.
Mid-day	1240	80.2 \ 93.2	3.4-4.1 / N	25% C.C.
End	1620	83.0 \ 92.3	5.7-6.6 / NW	40% CC

GPS Ident Code	GPS Easting**	GPS Northing**	Species	Comments	CLASS (1-5)	Burrow Suitable for (√=Yes): DT?	Wbo ?	Kfox ?	Badg ?
BDBB4001	707373	3724510	DB	Deteriorated, unused. Partial collapse & eroded but w/ general tortoise shape. 14"w x 9"H x 36 Deep.	4	✓	✓	✓	✓
BMAWV003	707373	3725249	MA	1 opening, 9" x 9" x unknown depth. Badger hole. Recent, possible active den.		✓	✓	✓	✓
BMAWV004	707305	3724841	MA	1 opening Badger dig: 9" x 9" x unknown Depth. Recent disturbance		✓	✓	✓	✓
BDBAD001	Pre existing waypoint			Both of these burrows are eroding and severely deteriorated. They have a general tortoise shape, but the roofs are collapsed so original shape is unkn.	4	✓	✓	✓	✓
BDBAD002	Preexisting waypoint				4	✓	✓	✓	✓
BMARK003	707219	3724749	MA	10" W x 8" H x 20" Long. Single opening in wash bank above BDBAD001.		✓	✓	✓	✓
BMAWV005	707202	3724602	MA	Single opening. Soil tunnel that is washed out. No animal sign		✓	✓		

*See Reverse and Complete Data Sheet for Desert Tortoises for ALL LIVE TORTOISES!!!

**Coordinate Grid, UTM 11N, NAD 83

Not completed N. of road: 707440 (Robin's property boundary)

707373 (← was not worked To the North)

North only

707180	WV	707120	WV	707060	DT	707000	RK			706940	BH				
707170	BH	7110	WV	7050	BH	706990	RK			6930	RK				
707160	RK	7100	BH	7040	WV	6980	BH	South only							
7150	RK	7090	DT	7030	WV	6970	BH								
7140	DT	7080	RK	7020	BH	6960	WV								
7130	BH	7070	RK	7010	DT	6950	WV	← South only							

DESERT TORTOISE FIELD SURVEY DATA SHEET - FOCUSED SURVEY

Site: Blythe

Date: 3/20/2010

Page 1 of 2

Easting Start	Easting End	Map #	Surveyor	GPS (Data)	Additional Surveyors and GPS Units	
707180	706930		DT	GTF4	BH SMC	RK SMD
					WV SME	

	Time	Temp (air/gnd)	Wind Sp/Dir	Weather & % Cloud
Start	8:10 AM	60.8F/60.8F	1.5-1.7 mph NE	Hazy, 20%
Mid-day	1325	83.9/95.0	.8-1.3 / N.	Dense Haze 70% c.c.
End	1630	87.5/91.4	0-.9 / N	90% c.c.

GPS Ident Code	GPS Easting**	GPS Northing**	Species	Comments	CLASS (1-5)	Burrow Suitable for (√=Yes): DT?	Wbo ?	Kfox ?	Badg ?
BKBBH003	707170	3725590	KF	Active kit fox burrow, 1 opening 12x7 in, end not seen, kit fox scat at entrance		✓	✓	✓	✓
BMAWV006	707121	3724404	MA	Single opening, 11x10, ends after 24 in, badger foraging burrow					
BNHDT001	707092	3724146	NH	1 female in flight, headed west					
BKBBH004	707105	3725441	KF	Inactive kit fox burrow, veg growing in entrance, 11x9 in, end not seen		✓	✓	✓	✓
BKBBH005	707098	3725475	KF	Inactive kit fox burrow, veg growing in entrance 11x12.5, end not seen		✓	✓	✓	✓
BDBWV001	707031	3724763	DT	Two connected burrows, possibly tortoise, inactive, veg in entrance, eroded to the point where	4	✓	✓	✓	
				origin can't be determined. Inside of wash, 8x5, end not seen. Marginal for WBO.					
BMABH005	707021	3724967	MA	Single burrow in side of wash, inactive, old kit fox scat at entrance.					
BDCBH002	706972	3725208	DC	Single Small piece of bone that is possibly tortoise (good probably) see back.	5				
BGBWV001	706945	3725015	Badger	Single 12x10 in burrow at base of wash bank under overhang, badger claw marks evident		✓	✓	✓	✓

*See Reverse and Complete Data Sheet for Desert Tortoises for ALL LIVE TORTOISES!!!

**Coordinate Grid, UTM 11N, NAD 83

Northern mockingbird, raven, sidewinder, side-blotched lizard, zebra-tail lizard, ash-throated flycatcher, black-throated sparrow

BDCBH002: Carcass (bone fragment) ≈ 20 mm X 13 mm. Time since death ≥ 4 years. In a large wash that recently flashed. Bone fragment could have washed a long distance. Photo taken by Dana Terry

INFORMATION INDEX FOR DESERT TORTOISE SIGN
Burrows and Dens, Scats, and Shell Remains

(1) Burrows and Dens:
1. currently active, with tortoise or recent tortoise sign
2. good condition, definitely tortoise; no evidence of recent use
3. deteriorated condition (please describe); definitely tortoise
4. deteriorated condition; possibly tortoise (please describe)
5. good condition; possibly tortoise (please describe)

(2) Scats:
1. wet (not from rain or dew) or freshly dried; obvious odor
2. dried with glaze; some odor; dark brown
3. dried; no glaze or odor; signs of bleaching (light brown), tightly packed material
4. dried; light light brown to pale yellow, loose material; scaly appearance
5. bleached, or consisting only of plant fiber

(3) Shell Remains:
1. fresh or putrid
2. normal color; scutes adhere to bone
3. scutes peeling off bone
4. shell bone is falling apart; growth rings on scutes are peeling
5. disarticulated and scattered

GPS and Field Note Nomenclature**

Eg. PDLSD001

P=Site Identifier, DL=live desert tortoise, SD=surveyor identifier (SD=Shelly Dayman), 001=observation #

Site Identifier Blythe=B Palen=P Ridgecrest=R

Species Identification Codes

Herps and Desert Tortoise	BB=burrow	**Bird Species (continued)**	**Mammals**
DL=desert tortoise live	BF=feather	NH=northern harrier, NN=nest	KB=kit fox burrow
DB=burrow	BP=pellets	BT=Bendire's thrasher, BN=nest	GL=American badger live
DS=scat	BO=other (describe)	CT=Crissal's thrasher, CN=nest	GB=American badger burrow
DC=carcass	**Bird Species**	GF=Gilded flicker, GN=nest	ML=Mojave ground squirrel live
DT=tracks	WK=White-tailed kite, KN=nest	GW=Gila Woodpecker, WN=nest	SL=big horn sheep live
DP=desert tortoise pallet	CO=Cooper's hawk, ON=nest	PR=prairie falcon, RN=nest	SC=big horn sheep carcass
DO=other (describe)	SW=Swainson's hawk, SN=nest	PE=peregrine falcon, PN=nest	SS=big horn sheep scat
Other Herps	FE=Ferruginous hawk, FN=nest	NE=unknown bird nest	BA=bat roosting sites
MF=Mojave fringe-toed lizard	GE=golden eagle, EN=nest		OO=other, specify in notes
Birds and Burrowing Owl	LS=loggerhead shrike, LN=nest		MA=mammal burrow
BL=burrowing owl live	LT=Le Conte's thrasher, HN=nest		BC=barrel cactus

Comments Needed***

1. **Burrows and Dens** -Type (burrow, pallet), location (under bush etc.), width, length, depth, other sign present
2. **Scats** – number and estimated size of scat
3. **Shell Remains** – record MCL (carapace length at midline) and PLN (plastron length), note any chips or shell anomalies
4. **Live Tortoises** – Complete Data Sheet for Live Tortoises and Health Profile Form for Desert Tortoises for ALL LIVE TORTOISES

Site: Blythe

DESERT TORTOISE FIELD SURVEY DATA SHEET - FOCUSED SURVEY

Date: 21 March, 2010

Easting Start	Easting End	Map #	Survey-or	GPS (Data)	Additional Surveyors and GPS Units	

	Time	Temp	Wind Sp/Dir	Weather & % Cloud
Start				
Mid-day				
End				

GPS Ident Code	GPS Easting**	GPS Northing**	Species	Comments	CLASS (1-5)	Burrow Suitable for (√=Yes): DT?	Wbo ?	Kfox ?	Badg ?
BMADT004	706974	3725003	MA	Single opening: 14"w x 9"h x 30" Deep. Kit fox scat out front. Top of wash bank		✓	✓	✓	✓
BMARH006	706970	3724754	MA	1 Mammal opening: 11"w x 13"h sunken. depth. Not active. probably badger.		✓	✓	✓	✓
BDBAD002	previously mapped			Gated burrow to monitor for future activity. Several DT scats at entrance, but no evidence of recent activity					
BDOLV001	706957	3724719	DO	Tortoise drinking depression on pavement above (35m away) known burrow.	Photos taken.				
BMARK004	706932	3723639	MA	Two openings. Inactive mammal burrow. approx 14"x12"x36" origin unkn.		✓	✓	✓	✓
BMABH007	706938	3725018	MA	10"w x 7"h x unknown depth. Burrow in inclined wash bank. Looks like bat guano? in entrance		✓	✓	✓	✓

*See Reverse and Complete Data Sheet for Desert Tortoises for ALL LIVE TORTOISES!!!

**Coordinate Grid, UTM 11N, NAD 83

706390	X	450	X	510	X												
400	X	460	X	520	X												
410	✓	470	X														
420	X	480	X														
430	X	490	X														
440	X	500	X														

DESERT TORTOISE FIELD SURVEY DATA SHEET - FOCUSED SURVEY

Site: Blythe Date: 3/21/10 Page 1 of 2

Easting Start	Easting End	Map #	Survey-or	GPS (Data)	Additional Surveyors and GPS Units	
706390	706520		GL	SM-11 ~~TGW-11~~	MRA-16	
					ADA-15	

	Time	Temp	Wind Sp/Dir	Weather & % Cloud
Start	9:15 am	57	1-3	5%
Mid-day				
End				

GPS Ident Code	GPS Easting**	GPS Northing**	Species	Comments	CLASS (1-5)	Burrow Suitable for (√=Yes): DT?	Wbo ?	Kfox ?	Badg ?
BDCAD004	0706416	3726063	DT	MCL - 9.5", Ad-11 female, part of tail and legs in carcass, scutes just starting to lift	2				
BDTAD002	0706383	3726008	DT	9" TRACK WIDTH, TRACKS FOUND ACROSS TANK TRACKS					
BKBAD002	0706413	3725775	WBO/KB	BURROWING OWL SCAT AND PELLETS PRESENT ACTIVE OLD KIT FOX SCAT.		✓	✓	✓	✓
BDTAD003	0706411	3725534	DT	8.5 inch wide TRACKS in wash, headed NE.					
BEBGL006	0706389	3725501	DT	TRACKS INSIDE, 11" WIDE x 6" High ACTIVE TORTOISE BURROW SW orientation	1	✓	✓		
BDPMR001	0706405	3725281	DT	TORTOISE PALLET, North facing, not been used this year. 9" wide x 5" high	2	✓			
BDLGL007	0706442	3724428	DT	old scut found in middle of wash 2 3/4" wide by 1 1/4" deep	5				
BDLGL008	0706443	3724574	DT	6 bones, 5 scutes, in wash	5				
BMAMR001	0706432	3725028	KB	3 opening, 1 entrance, kit fox burrow		✓	✓	✓	✓
BDBMR001	0706456	3724558	DT	9" ~~high~~ x 5" wide, caved in, partially blocked but could be cleared out.	3				

***See Reverse and Complete Data Sheet for Desert Tortoises for ALL LIVE TORTOISES!!!**
****Coordinate Grid, UTM 11N, NAD 83**

- Costas Hummer
- Black Throated Sparrow
- Northern Mockingbird
- Gambels Quail
- Leopard Lizard
- Whiptail
- Side Blotched
- Ornate Roadrunner

Site: Blythe

DESERT TORTOISE FIELD SURVEY DATA SHEET - FOCUSED SURVEY

Date: 3/21/10

Easting Start	Easting End	Map #	Survey-or	GPS (Data)	Additional Surveyors and GPS Units	
706390			GL	~~SAA~~ "	MRA-16	
					ADA-15	

Ground Temp 100°F at 2:21, 11% humidity

	Time	Temp	Wind Sp/Dir	Weather & % Cloud
Start				
Mid-day	2:21	83.0	0 → 1.6 mph west	100% haze
End	6:43	74 → 76° Ground Temp	0 → 2.2 mph southerly	50% haze 17% humidity

GPS Ident Code	GPS Easting**	GPS Northing**	Species	Comments	CLASS (1-5)	Burrow Suitable for (√=Yes): DT?	Wbo ?	Kfox ?	Badg ?
BDCAD005	0706449	3724567	DT	8 1/4" wide, large female, front half of shell	4				
BDEMR001	0706457	3724436	DT	carapace, 1 1/4 inch x 3/4 inch, float in middle of wash 2 pieces	5				
BDBMR002	0706464	3724403	DT	9" x 6" high, 9" x 7.5 ~~tall~~, in north facing bank, clay, cobble, caliche formation	2	X	X	X	X
BDBAD003	0706480	3724379	DT	Burro, NORTH FACING 10" w x 4" Tall small arroyo, 3' deep, plugged toward back	3	X	X	X	X
BDCMR002	0706470	3724556	DT	bone, 1/2" x 1 1/4" with backbone, floating in wash	5				
BDCMR003	0706469	3724588	DT	pelvic girdle, placed at Axis carcass	5				
BDTMR001	0706501	3725587	DT	TRACKS IN WASH 8" Spread on tracks, headed down wash (EAST)					
BKBAD002 ~~BMAAD~~	0706519	3724921	KB	Kit Fox, multiple opening, 4 openings		X	X	X	X

2 burrows side x side

*See Reverse and Complete Data Sheet for Desert Tortoises for ALL LIVE TORTOISES!!!

**Coordinate Grid, UTM 11N, NAD 83

580	X	590	X	650	X	710	X	770 1/2	1/2						
540	X	600	X	660	X	720	X	780	X						
550	X	610	X	670	X	730	X	790	X						
560	X	620	X	680	X	740	X	800	X						
570	X	630	X	690	X	750	X								
580	X	640	X	700	X	760 1/2	1/2								

DESERT TORTOISE FIELD SURVEY DATA SHEET - FOCUSED SURVEY

Site: BLYTHE

Date: 3/22

Page 1 of 2

Grand Temp Mid day - 101°

Easting Start	Easting End	Map #	Survey-or	GPS (Data)	Additional Surveyors and GPS Units	
706530	706800		MR	SM16	DT-GTF4	DG-SMF
					GL-SM11	AD-SM15

	Time	Temp	Wind Sp/Dir	Weather & % Cloud
Start	0755	63°F/62°F	0-3mph, N	Hazy, 50%
Mid-day	11:50	83F	0-3mph E	5% clouds
End				

14% humidity

GPS Ident Code	GPS Easting**	GPS Northing**	Species	Comments	CLASS (1-5)	Burrow Suitable for (√=Yes): DT?	Wbo ?	Kfox ?	Badg ?
BDCMR004	0706622	3724599	DT	8.5 MCL, Adult FEMALE, Mostly intact, photos 1-2	4				
BDDG001	0706597	3724835	DT	Desert tortoise pellet, NORTH FACING small WASH, 7"W x 4"T, Gelleta Grass	4	X			
BDCDT001	0706615	3725588	DT	SCUT FLOATING IN WASH, 2 inch square	5				
BMADT005	0706637	3724974	MA	LARGE MAMMAL Burrow, closes to 5x6 kit Fox SCUT		X	X	X	X
BDCGL009	0706680	3724606	DT	SCUT Floating in WASH	5				
BKBDT001 ~~BKBDT001~~	0706715	3724654	KB	kit Fox complex, active, 8 + burrows, scat, tracks, etc		X	X	X	X
BMAMR001	0706770	3724174	MA	burrow, 7" round, some weeds but open		X	X	X	X
BDSAD001	0706750	3723729	DT	Green, some odor, grass lined up, 2"x2", maybe 3 pieces together	2				
BDCAD006	0706752	3723572	DT	1" Long x 1/2 wide, floating in wash					
BDBGL007	0706803	3723631	DT	Tortoise scat 3 1/4" x 5/8, WIDTH - 11" Height 7" - scat outside entrance.	3	X	X	X	X

*See Reverse and Complete Data Sheet for Desert Tortoises for ALL LIVE TORTOISES!!!

**Coordinate Grid, UTM 11N, NAD 83

SCAT = 3

Gambels Quail
House Finch
* Longer head Shrike
Ash throated Flycatcher
Black throated Sparrow

ZEBRA-TAILED
SIDE BLOTCHED
whiptail
SPECKLED RATTLESNAKE

DESERT TORTOISE FIELD SURVEY DATA SHEET - FOCUSED SURVEY

Site: BLYTHE Date: 3/22/10 Page 2 of 2

Easting Start	Easting End	Map #	Survey-or	GPS (Data)	Additional Surveyors and GPS Units	

	Time	Temp	Wind Sp/Dir	Weather & % Cloud
Start				
Mid-day				
End	5:30	80°	5-11 W	90% cloud

Ground Temp 82° 10% Humidity

GPS Ident Code	GPS Easting**	GPS Northing**	Species	Comments	CLASS (1-5)	Burrow Suitable for (√=Yes): DT?	Wbo ?	Kfox ?	Badg ?
BMAAD002	0706797	3724973	MA	5 ENTRANCES South Facing above wash in desert pavement		X	X	X	X

*See Reverse and Complete Data Sheet for Desert Tortoises for ALL LIVE TORTOISES!!!

**Coordinate Grid, UTM 11N, NAD 83

708240	JBH.	708300	JH	708360		708420	JH										
8250	RB	8310	RB	8370		8430	RB										
8260	RK	8320	RK	8380		8440	RK										
8270	RK	8330	RK	8390		8450	RK										
8280	RB	8340	RB	8400		8460	RB										
8290	JH	8350	JB.	8410		8470	JH										

DESERT TORTOISE FIELD SURVEY DATA SHEET - FOCUSED SURVEY

Site: Blythe

Date: 3/22/2010

Page 1 of 1

Easting Start	Easting End	Map #	Survey-or	GPS (Data)	Additional Surveyors and GPS Units	
708240	708470		BH	SMA	RK SMC	
					RB SMD	

Air / ground

	Time	Temp	Wind Sp/Dir	Weather & % Cloud
Start	0850	62.5/60.8	0-.7/E.	20% cc / distant 4x-7c
Mid-day	1250	80.8/96.8	3.3-4.0/E.	35% cc
End	1620	82.8/81.0	7.1-9.5/W	98% cc / cooler and windy.

GPS Ident Code	GPS Easting**	GPS Northing**	Species	Comments	CLASS (1-5)	Burrow Suitable for (√=Yes): DT?	Wbo ?	Kfox ?	Badg ?
BDCBH-003	708232	3725064	DETO	2 x 2 cm. Found in wash. Isolated piece(s) Definately tortoise, Scute Seams apparant (Photo)	5				
				Time since death: > 4 yrs. Zi-limb bone, tortoise * See photo					
BOOBH001	708290	3725136	OO	Utah Climbing Milkweed in wash Climbing in Baileya Grass.					
BDCRK002	708273	3724959	DETO	6.5 x 4 cm Found adjacent to wash (not the same as BDCBH003) → near enough to	5				
				potentially be the same carcass but scavenged - Definate Tortoise, 6 pieces.					
BDCRB001	708310	3724488	?	1 x 1 cm Potentially tortoise → no definitive ID markings. Not found in wash	5				
BMARB001	708397	3725108		Burrow under rush milkweed. Relatively fresh canid digging, rodent droppings @ entrance. ~15 cm wide		✓		✓	✓

*See Reverse and Complete Data Sheet for Desert Tortoises for ALL LIVE TORTOISES!!!

**Coordinate Grid, UTM 11N, NAD 83

Coachwip (Masticophis sp.)

Patch-nosed Snake.

→ 706930, 940, 950 top part *

			706810	GL	706870	JH	706930(N)	JH									
			706820	AD	6880		706940(N)	ZS									
			706830	JH	6890	AD	706950(N)	AD									
			706840	JH	6900	AD											
N1/2	706760	GL	6850	AD	6910	ZS											
N1/2	706770	GL	6860	GL	6920	JH											

DESERT TORTOISE FIELD SURVEY DATA SHEET - FOCUSED SURVEY.

Site: Blythe

Date: 3/23/10

Page 1 of 2

Easting Start	Easting End	Map #	Survey-or	GPS (Data)	Additional Surveyors and GPS Units	
706930	706950		JBH.	SM-F	JBH.	SM-C.
					AD	SM-15

	Time	Temp (Air / ground)	Wind Sp/Dir	Weather & % Cloud
Start	0915	69.8 / 68.0	20.7-27.5 / N	98% C.C. / cool; breezy
Mid-day	1255	80.5 / 94.4	10.9-13.4 / N.NE.	[illegible] / sunny; breezy
End	1635	79.3 / 84.2	13.3-15.8 / N	1 sy. 3y. cc.

GPS Ident Code	GPS Easting**	GPS Northing**	Species	Comments	CLASS (1-5)	Burrow Suitable for (√=Yes): DT?	Wbo ?	Kfox ?	Badg ?
BDCGL011	0706807	3723667	DC	3 bone pieces from tortoise limb. Time since death >4 years. Not in a wash. Biggest piece 1"x1/2"	5				
BDTGL002	0706810	3723607	DT	Tortoise tracks: 8 1/2" (outside to outside). Recent.					
BMAAD003	706856	3724628	MA	Old burrow. Not active (annual veg. and erosion). Possible Badger claw marks.		✓			
BDCGL012	706864	3725209	DC.	Juvenile - T.S.D = 1-2 years. estimated MCL = 55mm. Carapace pieces present, cracked & broken; evidence of depredation. Class 2: Scutes generally normal color, but beginning to fade. Class 5: scattered because depredated	2,5				
BGBRS001	706940	3725636	GB	Badger Burrow under iron wood. Active (freshly disturbed soil). Round with claw marks					
BDCAD011	706942	3725640	DC.	Single piece of bone 11mm x 7mm. Hard on both sides with softer middle(?)	5 ← Bone T.S.D = > 4 yrs.				
BMABH008	706926	3725020	MA	Inactive (annual veg in entrance). Round burrow (possibly badger).		✓			✓

*See Reverse and Complete Data Sheet for Desert Tortoises for ALL LIVE TORTOISES!!!

**Coordinate Grid, UTM 11N, NAD 83

Site: Blythe

DESERT TORTOISE FIELD SURVEY DATA SHEET - FOCUSED SURVEY

Date: 3/23/2010

Easting Start	Easting End	Map #	Survey-or	GPS (Data)	Additional Surveyors and GPS Units	

	Time	Temp	Wind Sp/Dir	Weather & % Cloud
Start				
Mid-day				
End				

GPS Ident Code	GPS Easting**	GPS Northing**	Species	Comments	CLASS (1-5)	Burrow Suitable for (√=Yes): DT?	Wbo ?	Kfox ?	Badg ?
BDCBH004	706917	3724294	DC.	very small piece of bone: 20mm x 10mm. Hard on both sides. Wafer in middle.	5				
				T.S.D. => 4 years. In a large wash. May have moved w/water. Not Mineralized.					
BDCBH005	706865	3724359	D.C.	10 pieces of tortoise bone. T.S.D. >4 years. Partially buried in a wash.	5				
				Scute seams apparent. Adult.					
BDOBH001	706862	3724360	DO.	Tortoise eggshell. Approx 1/6 of shell present. In a wash. Translucent	* Photos: Art D. & Russ S.				
				appearance. Thin. Ping-pong ball curvature.					
BMARS001	706884	3724752	MA	Single opening. 12" x 16" H. Kit fox Seat out front. Old white wash (B.Owl).		✓	✓	✓	✓

*See Reverse and Complete Data Sheet for Desert Tortoises for ALL LIVE TORTOISES!!!

**Coordinate Grid, UTM 11N, NAD 83

INFORMATION INDEX FOR DESERT TORTOISE SIGN
Burrows and Dens, Scats, and Shell Remains

23 March, 2010
BDOB4001

(1) Burrows and Dens:

1. currently active, with tortoise or recent tortoise sign
2. good condition, definitely tortoise; no evidence of recent use
3. deteriorated condition (please describe); definitely tortoise
4. deteriorated condition; possibly tortoise (please describe)
5. good condition; possibly tortoise (please describe)

(2) Scats:

1. wet (not from rain or dew) or freshly dried; obvious odor
2. dried with glaze; some odor; dark brown
3. dried; no glaze or odor; signs of bleaching (light brown), tightly packed material
4. dried; light light brown to pale yellow, loose material; scaly appearance
5. bleached, or consisting only of plant fiber

(3) Shell Remains:

1. fresh or putrid
2. normal color; scutes adhere to bone
3. scutes peeling off bone
4. shell bone is falling apart; growth rings on scutes are peeling
5. disarticulated and scattered

GPS and Field Note Nomenclature**

Eg. PDLSD001

P=Site Identifier, DL=live desert tortoise, SD=surveyor identifier (SD=Shelly Dayman), 001=observation #

Site Identifier Blythe=B Palen=P Ridgecrest=R

Species Identification Codes

Herps and Desert Tortoise	BB=burrow	**Bird Species (continued)**	**Mammals**
DL=desert tortoise live	BF=feather	NH=northern harrier, NN=nest	KB=kit fox burrow
DB=burrow	BP=pellets	BT=Bendire's thrasher, BN=nest	GL=American badger live
DS=scat	BO=other (describe)	CT=Crissal's thrasher, CN=nest	GB=American badger burrow
DC=carcass	**Bird Species**	GF=Gilded flicker, GN=nest	ML=Mojave ground squirrel live
DT=tracks	WK=White-tailed kite, KN=nest	GW=Gila Woodpecker, WN=nest	SL=big horn sheep live
DP=desert tortoise pallet	CO=Cooper's hawk, ON=nest	PR=prairie falcon, RN=nest	SC=big horn sheep carcass
DO=other (describe)	SW=Swainson's hawk, SN=nest	PE=peregrine falcon, PN=nest	SS=big horn sheep scat
Other Herps	FE=Ferruginous hawk, FN=nest	NE=unknown bird nest	BA=bat roosting sites
MF=Mojave fringe-toed lizard	GE=golden eagle, EN=nest		OO=other, specify in notes
Birds and Burrowing Owl	LS=loggerhead shrike, LN=nest		MA=mammal burrow
BL=burrowing owl live	LT=Le Conte's thrasher, HN=nest		BC=barrel cactus

Comments Needed***

1. **Burrows and Dens** -Type (burrow, pallet), location (under bush etc.), width, length, depth, other sign present
2. **Scats** – number and estimated size of scat
3. **Shell Remains** – record MCL (carapace length at midline) and PLN (plastron length), note any chips or shell anomalies
4. **Live Tortoises** – Complete Data Sheet for Live Tortoises and Health Profile Form for Desert Tortoises for ALL LIVE TORTOISES

706760	✓	708480	✓												
706770	✓	708490	✓												
~~708480~~															
~~708490~~															

Site: Blythe

DESERT TORTOISE FIELD SURVEY DATA SHEET - FOCUSED SURVEY

Date: 3/23/10

Page 1 of 1

Easting Start	Easting End	Map #	Survey-or	GPS (Data)	Additional Surveyors and GPS Units	
			GL	11		

	Time	Temp	Wind Sp/Dir	Weather & % Cloud
Start				
Mid-day		90.5 / 91.4	10-17 mph	15% cc
End	4:21 pm	80°F	6-12 mph	0% cc

GPS Ident Code	GPS Easting**	GPS Northing**	Species	Comments	CLASS (1-5)	Burrow Suitable for (√=Yes): DT?	Wbo ?	Kfox ?	Badg ?
BDCGL013	708489	3725046	DT	1 adult DT bone. marginal. likely molar from adult female 3/4"x 1/2" slightly mineralized	5				

*See Reverse and Complete Data Sheet for Desert Tortoises for ALL LIVE TORTOISES!!!

**Coordinate Grid, UTM 11N, NAD 83

Site: Blythe

DESERT TORTOISE FIELD SURVEY DATA SHEET - FOCUSED SURVEY

Date: 24, March 2010

Easting Start	Easting End	Map #	Survey-or	GPS (Data)	Additional Surveyors and GPS Units	
708500	708810			(RK) SM-Garmin D	JBH →	SM F

	Time	°F Temp (Air/ground)	(mpH.) Wind Sp/Dir	Weather & % Cloud
Start	0810	62.9/64.0	4.7-5.6/N.	2% C.C.
Mid-day	1300	79.4/93.2F	7.6-9.0/N.,NE	75% C.C.
End	1730	78.0/80.0	0-5.0/W	40% High Clouds

GPS Ident Code	GPS Easting**	GPS Northing**	Species	Comments "Note:" denotes inches.	CLASS (1-5)	Burrow Suitable for (√=Yes): DT?	Wbo ?	Kfox ?	Badg ?
BDCRS001	708514	3724369	DC	1 very old piece (mineralized) of plastron dermal bone. 2.5" x 3.0". (inches)	5				
BMARS002	708590	3724815	MA	Canid foraging dig: 9"w x 5"h x 11" deep. in a creosote bush. Not active.		✓			
BGBRS001	708681	3723791	GB	Fresh badger burrow. Active. Claw marks visible. Can't see the end.		✓	✓		✓
BHMBH001	708662	3725172	HM	20 plants at this location					
~~BBPRS001~~									
BOORS001	708726	3723722	OO	Great-horned owl pellets. Two large pellets & scat under an ironwood snag					
BDBBH002	~~708749~~ 708749	3723847	DB	Burrow under an ironwood in microphyll woodland wash. 210mm W X 180mm H x 250mm	4	✓			
				Deep. Pack rat midden that had been dug-out. typical of tortoise. Burrow inactive					
				with no definitive tortoise sign. possibly dug-out by carnivore.					
BMABH009	~~708811~~ 708816	3723667	MA	Old inactive burrow in Rocky cliff band of incised wash. Origins unknown.		✓	✓		

*See Reverse and Complete Data Sheet for Desert Tortoises for ALL LIVE TORTOISES!!! 20"w x 12"H x 12" deep.

**Coordinate Grid, UTM 11N, NAD 83

Reptiles Blythe Species List possible additions:

Desert Spiny Lizard (Sceloporous magister)

Birds - Spotted towhee

Great-horned Owl (pellets evidence of presence)

last line is: 0709100

0708500	✓	0708560	✓	8620	✓	8680	✓	8740	✓								
0708510	✓	0708570	✓	8630	✓	8690	✓	8750	✓								
0708520	✓	0708580	✓	8640	✓	8700	✓	8760	✓								
0708530	✓	0708590	✓	8650	✓	8710	✓	8770	✓								
0708540	✓	0708600	✓	8660	✓	8720	✓										
0708550	✓	0708610	✓	8670	✓	8730	✓										

ART
BROOKS
GREGG
RUSS
DONNA

DESERT TORTOISE FIELD SURVEY DATA SHEET - FOCUSED SURVEY

Site: Blythe Date: 3/24/10 Page 1 of 2

Easting Start	Easting End	Map #	Surveyor	GPS (Data)	Additional Surveyors and GPS Units	
0708500	708730		AD	SM11	~~[illegible]~~	SM15

	Time	Air / ground °F Temp	mph Wind Sp/Dir	Weather & % Cloud
Start	0810	62.9/64.0	4.7-5.6/N.	2% C.C.
Mid-day	1230	77/92	2-11/NE	30% high
End	1730	78/80	0-5/W	40% High

GPS Ident Code	GPS Easting**	GPS Northing**	Species	Comments	CLASS (1-5)	Burrow Suitable for (√=Yes): DT?	Wbo ?	Kfox ?	Badg ?
BDCGL014	708532	3723533	DT	1.5 x 1.0 cm carapace fragment Not mineralized	5				
BDCAD007	708519	3724461	DT	1.5 x 2.5 cm plastron fragment Mineralized	5				
BDCAD008	708522	3724549	DT	2 x 2 cm plastron fragment Not mineralized.	5				
BDCAD009	708601	3724100	DT	1 x 1.5 cm shell fragment Mineralized.	5				
BHMGL001	708693	3724622	HM	5 plants - Flower & fruit Sandy spot in pavement					
BHMGL002	708693	3724803	HM	1 plant - Flower & fruit Sandy spot in desert pavement					
BHMAD001	708680	3725231	HM	2 plants - Flower and fruit In sandy pocket on desert pavement					
BHMAD002	708709	3724613	HM	≈20 plants - Flower & fruit Sandy spot on desert pavement					
BHMAD003	708710	3724550	HM	12 plants - Flower & fruit Sandy spot on desert pavement					
BHMAD004	708766	3724427	HM	5 plants - Flower & fruit Sandy area on desert pavement					

HM - Harwood's milkvetch

*See Reverse and Complete Data Sheet for Desert Tortoises for ALL LIVE TORTOISES!!!

**Coordinate Grid, UTM 11N, NAD 83

Side-blotched lizard
Zebra-tailed lizard
Whiptail lizard
Long-tailed brush lizard
Western whiptail lizard
Costa's hummingbird
Leopard lizard
Turkey Vulture
White-crowned sparrow
Ash-throated flycatcher
Horned lark
Cactus wren
Ladder-backed Woodpecker
Greater Roadrunner

8740	✓	8800	✓												
8750	✓	8810	✓												
8760	✓														
8770	✓														
8780	✓														
8790	✓														

Site: Blythe

DESERT TORTOISE FIELD SURVEY DATA SHEET - FOCUSED SURVEY

Date: March 24, 2010

Easting Start	Easting End	Map #	Survey-or	GPS (Data)	Additional Surveyors and GPS Units	
	708810		AD	SM11	GL	SM15

AIR/Ground

	Time	Temp F	Wind Sp/Dir MPH	Weather & % Cloud
Start				
Mid-day				
End	1730	78/80	0-5/W	40% High Clouds

GPS Ident Code	GPS Easting**	GPS Northing**	Species	Comments	CLASS (1-5)	Burrow Suitable for (√=Yes): DT?	Wbo ?	Kfox ?	Badg ?
BKBAD003	708775	3724595	KB	4 openings - Active complex tracks & scat		✓	✓	✓	✓
~~BKT~~ BHMAD005 BHMA005	708771	3724671	HM	1 Plant - in silty pocket on desert pavement					
BHMAD006	708782	3725223	HM	3 Plants - in silty wash					
BHMAD007	708780	3725073	HM	1 Plant - in silty wash					
BDCGL015	708792	3725077	DT	2.5 x 1.5 cm - Carapace fragment - Not Mineralized	5				

HM - Hanwood's milkvetch

*See Reverse and Complete Data Sheet for Desert Tortoises for ALL LIVE TORTOISES!!!

**Coordinate Grid, UTM 11N, NAD 83

Leopard lizard

W. Diamondback rattlesnake

707870	BH	707880	DG	708940	DG	709000 ~~708000~~	BH								
830	RS	890	AD	950	GL	709080	RS								
840	AD	707900	RS	960	GL	709020	GL								
850	DG	910	BH	970	DG	9030	GL								
860	GL	920	BH	980	RS	9040	RS								
870	GL	930	RS	990	BH	9050	BH								

DESERT TORTOISE FIELD SURVEY DATA SHEET - FOCUSED SURVEY

Site: Blythe

Date: 25 March 2010

Page 1 of 2

Easting Start	Easting End	Map #	Survey-or	GPS (Data)	Additional Surveyors and GPS Units	
708820	709050		JBH.	RS - Sm. Garmin F	JBH - Sm Garmin E	

	Time	Temp °F Air / ground	Wind Sp/Dir (mph.)	Weather & % Cloud
Start	0845	62.2/61.7	2.2-5.2/S.E.	3% C.C. / hazy
Mid-day	1210	82.9/87.8	8.9-13.1/S.E	35% cu.
End	1600	84.6/87.8	11.0-18.0/S.,S.W.	20% C.C.

GPS Ident Code	GPS Easting**	GPS Northing**	Species	Comments	CLASS (1-5)	Burrow Suitable for (√=Yes): DT?	Wbo ?	Kfox ?	Badg ?
BHMBH002	708841	3725250	Hm	Harwood's milkvetch. Single plant in a washed. Small, deep violet flowers					
BMAR5003	708926	3724081	MA.	10in W & 5in H & 12in deep. Origin unknown. Not active. Potential for tortoise use.		✓			
BHMBH003	708941	3725165	Hm	Harwood's milkvetch. Deep violet flowers. 5 plants at this location.					
BHMBH004	708990	3725238	Hm	Harwoods milk vetch. 4 plants.					
BOOBHØØ2	709046	3724188	OO	Utah climbing milkweed. Small yellow flowers. Growing in various shrubs					
				within a narrow drainage that is dissected by desert pavement.					
BHMGL003	709030	3725190	Hm	Single plant.					

*See Reverse and Complete Data Sheet for Desert Tortoises for ALL LIVE TORTOISES!!!

**Coordinate Grid, UTM 11N, NAD 83

- Verdin, Turkey vulture, Brewer's sparrow, white-crowned sparrow, Black-throated sparrow, Ash-throated flycatcher, Horned-lark, Yellow-rumped warbler

708820	✓	708880	✓	708940	✓	709000	✓								
708830	✓	890	✓	8950	✓	9010	✓								
708840	✓	900	✓	8960	✓	9020	✓								
708850	✓	910	✓	8970	✓	9030	✓								
708860	✓	920	✓	8980	✓	9040	✓								
708870	✓	930	✓	8990	✓	9050	✓								

DESERT TORTOISE FIELD SURVEY DATA SHEET - FOCUSED SURVEY

Site: Blythe

Date: 3/25/10

Easting Start	Easting End	Map #	Survey-or	GPS (Data)	Additional Surveyors and GPS Units	
708820	709050		DG		GL	11
					AD	15

	Time	Temp	Wind Sp/Dir	Weather & % Cloud
Start	8:51 am	64°F	1-4 mph	2% cc
Mid-day				
End				

GPS Ident Code	GPS Easting**	GPS Northing**	Species	Comments	CLASS (1-5)	Burrow Suitable for (√=Yes): DT?	Wbo ?	Kfox ?	Badg ?
BHMAD009	0708850	3724941	HM	Harwood's Milk Vetch. ~~2 plants~~ 5 11 plants, in drainage on desert pavement.					
BHMAD010	0708855	3724488	HM	Harwood's Milk Vetch. 6 plants. in sandy desert pavement area.					
BDCGL016	0708942	3725127	DT	1 inch x 1/2 inch mineralized shell fragment likely from plastron	5				
Small BDBGL013	0708850	3723691	DT	potential tortoise burrow in caliche. No evidence of use. Hole in roof deteriorated. 12" x 8" 2 ft deep	4	✓	✓		

*See Reverse and Complete Data Sheet for Desert Tortoises for ALL LIVE TORTOISES!!!

**Coordinate Grid, UTM 11N, NAD 83

HM = Harwood's Milk Vetch

White crown sparrow
Horn Lark
Ash throated fly catcher

709060	✓			9110	✓											
70	✓			9120	✓											
80	✓			9130	✓											
90	✓			9140	✓											
9100	✓			9150	✓											

Site: Blythe

DESERT TORTOISE FIELD SURVEY DATA SHEET - FOCUSED SURVEY

Date: 3/26/10

Page 2 of ____ ?

Easting Start	Easting End	Map #	Survey-or	GPS (Data)	Additional Surveyors and GPS Units
709060			SDA	~~SDA~~ F	GLG – ~~DAE~~

Air/Ground

	Time	Temp	Wind Sp/Dir	Weather & % Cloud
Start	0845	67.0/64.4	5.0 · 14.0N	0% CC
Mid-day	1112AM	75.0/78.3	4-~~5~~.7.1 W	0% CC
End				

GPS Ident Code	GPS Easting**	GPS Northing**	Species	Comments	CLASS (1-5)	Burrow Suitable for (√=Yes): DT?	Wbo ?	Kfox ?	Badg ?
	@ 3724170 out of box, continued on lines								

~~HMV2~~

~~Harwoods with velet~~

*See Reverse and Complete Data Sheet for Desert Tortoises for ALL LIVE TORTOISES!!!

**Coordinate Grid, UTM 11N, NAD 83

utah vine milkweed 0709145/3724085 (5) ~~HMV 10m to west~~

- desert cottontail, jackrabbit, osprey (migrating), striped skunk (carcass

fence lizard, sage thrasher desert iguana

0708990	GL	✓	940	MR	✓	890	GL	✓	840	MR	✓	790	GL	✓	740	MR	✓	690	GL	✓	640	MR	✓	590	GL	✓	540	MR	✓
980	RS	✓	930	RB	✓	880	RS	✓	830	RB	✓	780	RS	✓	730	RB	✓	680	RS	✓	630	RB	✓	580	RS	✓	530	RB	✓
970	SD	✓	920	SD	✓	870	SD	✓	820	SD	✓	770	SD	✓	720	SD	✓	670	SD	✓	620	SD	✓	570	SD	✓	520	SD	✓
960	RB	✓	910	RS	✓	860	RB	✓	810	RS	✓	760	RB	✓	710	RS	✓	660	RB	✓	610	RS	✓	560	RB	✓	510	RS	✓
950	MR	✓	900	GL	✓	850	GL	✓	800	GL	✓	750	MR	✓	700	GL	✓	650	MR	✓	600	GL	✓	550	MR	✓	500	GL	✓
940							MR																						

																								490	GL	✓	440	MR	✓
																								480	RS	✓	430	RB	✓
																								470	SD	✓	420	SD	✓
																								460	RB	✓	410	RS	✓
																								450	MR	✓	400	GL	✓

DESERT TORTOISE FIELD SURVEY DATA SHEET - FOCUSED SURVEY

Site: Blythe

Date: 3/27/10

Page 1 of

Easting Start	Easting End	Map #	Surveyor	GPS (Data)	Additional Surveyors and GPS Units	
0708990	0708400		SDA - D		RBO-	MRA-
					GL4-11	RSM-

	Time	Temp	Wind Sp/Dir	Weather & % Cloud
Start	8:29AM	66°F	12-17mph	0% CC
Mid-day	11:50AM	73°F ground	13-19mph	0% CC
End	2:27pm	77°F	7to13mph	0%

GPS Ident Code	GPS Easting**	GPS Northing**	Species	Comments	CLASS (1-5)	Burrow Suitable for (√=Yes): DT?	Wbo ?	Kfox ?	Badg ?
BMASD001	0708968	3727010	mammal	10"x6" mammal burrow, potential for WBO no sign		low	✓(3)	X	X
BHMSD001	0708920	3726901	Harwood's milkvetch	10 plants, purple flowers w/pods ~~[illegible]~~ more within area					
BDCMR005	0708752	3727182	DT	mineralized tortoise bone fragment 1"x1/2"	5				
BDCGL017	0708788	3727528	DT	mineralized tortoise bone fragment 1/2"x1/4"	5				
BDCSD005	0708771	3727562	DT	starting to mineralize, vertebral	5				
BDCRB002	0708734	3727583	DT	10+ pieces of tortoise bone fragment flaking, adult, plastron, some carapace	5, some pieces 7"x7"				
BDCGL018	0708692	3727320	DT	mineralized DT bone 1/4"x1/4"	5				
BMAMR002	0708638	3727357	mammal	mammal dig, could be used as a pallet by ~~BO~~ tortoise, no evidence of use		✓	X	X	X
BMARS004	0708615	3727055	mammal	7"x5" in round tuled complex, suitable for burrowing owl, no sign		X~~✓~~	✓	X	X

*See Reverse and Complete Data Sheet for Desert Tortoises for ALL LIVE TORTOISES!!!

**Coordinate Grid, UTM 11N, NAD 83

sidebotched zebratail desert horned lizard whiptail

erodium texanum blister beetle desert iguana

leopard lizard jackrabbit

0708390	✓	320	✓	260	✓	200	✓										
380	✓	310	✓	250	✓	190	✓										
370	✓	300	✓	240	✓	180	✓										
360	✓	290	✓	230	✓	170	✓										
350	✓	280	✓	220	✓	160	✓										
340	✓	270	✓	210	✓												
330 ✓																	

DESERT TORTOISE FIELD SURVEY DATA SHEET - FOCUSED SURVEY

Site: Blythe Date: 3/28/10 Page 1 of _____

Easting Start	Easting End	Map #	Survey-or	GPS (Data)	Additional Surveyors and GPS Units	
0708390			RSM MRA			

	Time	Temp	Wind Sp/Dir	Weather & % Cloud
Start	0825	60°	0-10mph	0% cloud
Mid-day				
End	1430	81°	0-10 mph	0%

mph- miles per hour

GPS Ident Code	GPS Easting**	GPS Northing**	Species	Comments	CLASS (1-5)	Burrow Suitable for (√=Yes): DT?	Wbo ?	Kfox ?	Badg ?
BMARS005	708291	372749		NO recent sign of use. NO claw marks. NO fecal around	~~NA~~	✓	✓	✓	✓

*See Reverse and Complete Data Sheet for Desert Tortoises for ALL LIVE TORTOISES!!!
**Coordinate Grid, UTM 11N, NAD 83

Incidentials

Reptiles: Side-blotch lizard, Sidewinder, whiptail lizard, Desert Iguanas, desert horned lizard, Zebra-tail Lizard

Birds: Black-throated Sparrows

note: remains of deer skull (I.D.#) by what was left of antler.

Black-tailed Jack Rabbit

0705580	~~DT~~	GL ✓	40	MR	✓	500	GL										
70	SD	✓	30	DT	✓	490	SD										
60	DT	✓	20	SD	✓	480	DT										
50	MR	✓	10	GL	✓	470	MR										

DESERT TORTOISE FIELD SURVEY DATA SHEET - FOCUSED SURVEY

Site: Blythe

Date: 3/29/10

Page 1 of 2

Easting Start	Easting End	Map #	Survey-or	GPS (Data)	Additional Surveyors and GPS Units	
0705580			SDA/AD	D	GLU-11	DTE-GIFA
					MRA-SMIS	

	Time	Air Temp	Wind Sp/Dir	Weather & % Cloud
Start	8:03AM	62.8°F	0 to 2 mph	15% CC
Mid-day	12:45 PM	90 °F	0 - 1 mph	High clouds, hazy, 95%
End	3:40 PM	90° F	4 - 6 mph	High clouds, hazy, 50%

GPS Ident Code	GPS Easting**	GPS Northing**	Species	Comments	CLASS (1-5)	Burrow Suitable for (√=Yes): DT?	Wbo ?	Kfox ?	Badg ?
BDCMR006	0705547	3727696	DT	small piece of ~~DT~~ tortoise bone fragment, 1/2"x 1/4" not mineralized	5				
BDCMR007	0705544	3727716	DT	two pieces of tortoise bone fragments, beginning to flake 1/4"x 1/2" each	5				
BKBGL004	0704706	3728181	kitfox	large opening, but turns like kit fox burrow		potential	✓	✓	possible foraging
BDCGL019	0704630	3728183	DT	tortoise bone fragment, adult, vertebral flaking, within wash, 1/2"x 1 1/2"	5				
BDCSD001	0704547	3728166	DT	adult ~~DT~~ tortoise bone fragment, vertebral, not same animal as BDCGL019	5	- beginning to flake 1"x 1"			
BDCDT002	0704335	3728159	DT	two vertebrals, two costals, adult DT all attached, bones flaking 3 1/2"x 3 1/2"	5				
BDCGL020	0704297	3728178	DT	one piece of adult tortoise marginal bone fragment 1/2"x 1/2", flaking	5				
BDCMR008	0704238	3728146	DT	one small piece of ~~DT~~ tortoise bone fragment with scute line 1/4"x 1/4" flaking	5				
BKBDT002	0705557	3727229	kitfox?	possible kit fox burrow, narrows quickly through		✓	✓	✓	no sign
BDCMR009	0705562	3727210	DT	two pieces of tortoise, 1/4"x 1/4" likely juvenile, one piece marginal	5				

*See Reverse and Complete Data Sheet for Desert Tortoises for ALL LIVE TORTOISES!!!

**Coordinate Grid, UTM 11N, NAD 83

Top GL 370 - ~~GL~~ ~~MR~~ 310 - ~~DT~~ ~~SD~~ DT
SD 340 - ~~SD~~ ~~DT~~ 280 - ~~MR~~ ~~GL~~ MR

- Ash-throated flycatcher, mockingbird, house finch

lesser nighthawk, Gambel's quail, white-crown sparrow, black-throated sparrow, turkey vulture

road turn- 0707186 | 3726925 side-blotched lizard, western whiptail, long-tailed brush lizard, desert iguana, zebra-tail lizard

Vehicles - 0705558 | 3727618

Utah Vine 0704119 | 3728154 Button 0704188 | 3728096 (2)

150 South

120 GL	60 DT	70
90 SD	30 MR	20
		80/70

705500	GL	705440	GL	705380	MR										
490	AD	430	AD	370	DT										
480	DT	420	AD	360	GL										
~~470~~	MR	410	GL	350	AD										
460	MR	400	DT												
450	DT	390	MR												

DESERT TORTOISE FIELD SURVEY DATA SHEET - FOCUSED SURVEY

Site: Blythe

Date: 3/29/10

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Easting Start	Easting End	Map #	Survey-or	GPS (Data)	Additional Surveyors and GPS Units	

	Time	Temp	Wind Sp/Dir	Weather & % Cloud
Start				
Mid-day				
End				

GPS Ident Code	GPS Easting**	GPS Northing**	Species	Comments	CLASS (1-5)	Burrow Suitable for (√=Yes): DT?	Wbo ?	Kfox ?	Badg ?
BKBDT003	0705528	3727193	Kitfox	potential kit fox burrow, one collapsed, other turns to right		✓	✓	✓	no sign
BDCGL021	0705497	3727719	DT	mineralized tortoise bone 1½" x 1"	5				
BMAMR003	704901	3728023	MA	6.5 in wide x 7 in tall, north-facing in bank of wash		✓	✓	✓	✓
BMAMR004	704965	3728029	MA	7.5 x 5 in, partially collapsed, north-facing in bank of wash		✓	✓	✓	✓
BDPMR002	705470	3727556	DT	~7 in wide x 3.5 in tall, ~16 inches deep, definitely tortoise, no signs of recent activity.					
BDCMR010	0705462	3727153	DT	Adult animal, marginal probably over leg 1.5 inches x 1 inch NOT MINERALIZED	5				
BBLAD001	705488	3727279	Barrel cactus	4" tall, under iron wood					
BDCGL022	0705361	3727730	DT	6 pieces old tortoise bones. mineralized	5				

*See Reverse and Complete Data Sheet for Desert Tortoises for ALL LIVE TORTOISES!!!

**Coordinate Grid, UTM 11N, NAD 83

37

0708990	MR	✓	880					671	1500	SD	✓						
9~~00~~	~~SD~~	DT	870						1490	DT	✓						
910	SD	✓	860						1480	MR	✓						
920		✓							1470	MR							
930		✓							1460	DT							
940		✓							1450	SD							

Site: Blythe

DESERT TORTOISE FIELD SURVEY DATA SHEET - FOCUSED SURVEY

Date: ~~3/27/10~~ 3/30/10

Page 1 of 2

Linear segment on east side

Easting Start	Easting End	Map #	Surveyor	GPS (Data)	Additional Surveyors and GPS Units
~~0708990~~			SDA	D	MRA - SMF DTE - GTF4

	Time (8:00 AM start)	Temp	Wind Sp/Dir	Weather & % Cloud
Start	9:31 AM	75°F	0-2 mph tow	5% cc
Mid-day	12:17 PM	90°F	9-11 mph to N	10% cc
End	3:15 PM	94°F	11-15 mph to N	High clouds, 65%

GPS Ident Code	GPS Easting**	GPS Northing**	Species	Comments	CLASS (1-5)	Burrow Suitable for (√=Yes): DT?	Wbo ?	Kfox ?	Badg ?
BHHMMR001	0712319	3726921	Harwood's milkvetch	2 plants, more @ 0712280/3726890					
BMASD002	0712174	3726899	mammal	potential burrowing owl burrow 6"x6"		X	✓	X	X
BKBMR002	0712152	3726892	kitfox	3 kit fox burrows, along berm kit fox scat, active		would need to be modified		✓	X
BMADT007	0712150	3726899	mammal	potential burrowing owl burrow 7"x7" in side of berm		X	✓	~~X~~ ✓	X
BSWMR001	0711857	3726910	Swainson's hawk	Swainson's hawk, near agricultural areas, 100 m to south of this point	(pair)				
BKBMR003	0711481	3726874	kitfox	potential kit fox burrow, fresh digging tree above (dead)		low	X	✓	X
BKBDT004	0711492	3726783	kitfox complex	four burrows, in berm, kit fox complex, no scat		✓	✓	✓	X
BMASD003	0711506	3726662	mammal	round-tail ground squirrel complex in berm, some burrows large enough for burrowing owl		X	✓	X	X
BKBSD002	0711509	3726632	kitfox	one kit fox burrow, in berm, no scat		✓	✓	✓	X
BKBMR004	0711575	3726879	kitfox	two burrows in berm, kit fox, plus 3 burrows, 10 m to east with weeds @ entrances		✓	✓	✓	X

*See Reverse and Complete Data Sheet for Desert Tortoises for ALL LIVE TORTOISES!!!

**Coordinate Grid, UTM 11N, NAD 83

Zebra-tailed lizard
Side-blotched lizard
Northern mockingbird

Swainson's hawk (near orchard)

Anna's ~~Costa's~~ hummingbird, black phoebe, roadrunner, wild burro

~~35~~

619-233-1454

mourning dove, tamarisk trees white winged dove
white crowned sparrow, ~~western toads~~ ~~or green plovers~~ toad (pictures)

925-212-4720

woodhouse's toad dead mummified toads

6~680	✓			3726739	✓											
68 7050	✓			6800	✓											
68 6020	✓															
6~ 50790	✓															
40 760	✓															
50 730	✓															

Site: Blythe

DESERT TORTOISE FIELD SURVEY DATA SHEET - FOCUSED SURVEY

Date: 3/30/10

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Easting Start	Easting End	Map #	Survey-or	GPS (Data)	Additional Surveyors and GPS Units	

	Time	Temp	Wind Sp/Dir	Weather & % Cloud
Start				
Mid-day	12:17 pm	90°F	9 to 11 mph to N	10% CC
End				

GPS Ident Code	GPS Easting**	GPS Northing**	Species	Comments	CLASS (1-5)	Burrow Suitable for (√=Yes): DT?	Wbo ?	Kfox ?	Badg ?
BDBMR003	~~07~~ 0711626	3726881	DT?	burrow in berm, could be either kit fox or potential for tortoise, flat bottom	5	✓	✓	✓	clay
3DCMR011	0712517	3726720	DT	Small piece of juvenile tortoise bone, not mineralized, plastron marginal	5				

*See Reverse and Complete Data Sheet for Desert Tortoises for ALL LIVE TORTOISES!!!

**Coordinate Grid, UTM 11N, NAD 83

Site: Blythe

DESERT TORTOISE FIELD SURVEY DATA SHEET - FOCUSED SURVEY

Date: 3/30/10

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Easting Start	Easting End	Map #	Survey-or	GPS (Data)	Additional Surveyors and GPS Units	
3/4 & 1 mile buffer			GL	SM11	AD SM15	

	Time	Temp	Wind Sp/Dir	Weather & % Cloud
Start	8:06 am	64°F	0-1.5mph	1-2% cc
Mid-day				
End				

GPS Ident Code	GPS Easting**	GPS Northing**	Species	Comments	CLASS (1-5)	Burrow Suitable for (√=Yes): DT?	Wbo ?	Kfox ?	Badg ?
BDPGL005	707150	3722353	DT	potential tortoise pallet in caliche. in wash. large opening. 24" x 10". 1.5ft deep	2	✓			
BDPAD005	707145	3722346	DT	potential tortoise pallet. smaller size for small tort. no evidence of recent 9" x 5". 10" deep	5	✓			
BDPGL006	707127	3722374	DT	potential tortoise pallet. rock pallet. 9" x 6". 15" deep	5	✓			
BDPGL007	706945	3722389	DT	4 tortoise pallets (potential) in wash. small. should check area.	5	✓			
BDPAD006	706902	3722365	DT	potential tortoise pallets. rock pallet. 12" x 6"	5	✓			
BDPGL008	706870	3722379	DT	potential tortoise pallet. rock pallet 10" x 9". 2 ft deep	5	✓			
BDBGL008	706868	3722374	DT	Active tortoise burrow with fresh tracks. rock burrow. 9" x 6" ~ 3-4 ft deep	1	✓	✓		
BDPAD007	706862	3722373	DT	potential tortoise pallet. rock pallet 15" x 10". 4 other rock shelters in vicinity	5	✓			
BDPAD008	706836	3722372	DT	potential tortoise pallet. rock pallet/ shelter. 12" x 6"	5	✓			
BDPGL009	706768	3722372	DT	tortoise pallet in wash. 10" x 6" 1 ft deep.	5	✓			

*See Reverse and Complete Data Sheet for Desert Tortoises for ALL LIVE TORTOISES!!!

**Coordinate Grid, UTM 11N, NAD 83

Side blotched lizard, road runner, black throated sparrow, ash throated fly catcher, rock wren
Collared lizard, poor-will, turkey vulture, gray fox, says phoebe

Site: Blythe

DESERT TORTOISE FIELD SURVEY DATA SHEET - FOCUSED SURVEY

Date: _____

Easting Start	Easting End	Map #	Survey-or	GPS (Data)	Additional Surveyors and GPS Units	

	Time	Temp	Wind Sp/Dir	Weather & % Cloud
Start				
Mid-day				
End				

GPS Ident Code	GPS Easting**	GPS Northing**	Species	Comments	CLASS (1-5)	Burrow Suitable for (√=Yes): DT?	Wbo ?	Kfox ?	Badg ?
BDPGL010	706733	3722360	DT	potential tortoise pallet in wash 20"x10" 1ft. deep	5	✓			
BDBAD004	706556	3722395	DT	rock tortoise burrow. 24"x7" 3ft. deep. fresh tracks (tort), veg. is pushed over	1	✓	✓		
~~BDBGL009~~	~~706412~~	~~3722450~~	~~DT~~	Several rock pallets within 30ft.		~~✓~~	~~✓~~		
BDBGL009	706412	3722450	DT	Large DT burrow. rock burrow no sign of recent use. 25"x12" 4ft deep	5	✓	✓		
BDPAD009	706459	3722419	DT	potential tortoise pallet. rock pallet 24"x9" 2ft deep. another pallet 5ft away	5	✓			
BDBGL014	706362	3722438	DT	2 tortoise burrows in arroyo. 1 piece of tortoise scat in burrow. 11"x7" 2ft deep	1	✓			
			DS	scat. 1"x.5" from younger animal	3				
BDPAD012 ~~BDPAD012~~	706332	3722461	DT	Tortoise pallet. rock pallet. 20"x10"	5	✓			
BDPAD013 ~~BDPAD013~~	706310	3722475	DT	3 potential tortoise pallets. 1 is perfect for a smaller tortoise. rock pallets	5	✓			
BDPAD014	706313	3722462	DT	tortoise pallet, rock pallet. older tortoise tracks inside. Another pallet 10m away	2	✓			

*See Reverse and Complete Data Sheet for Desert Tortoises for ALL LIVE TORTOISES!!!

**Coordinate Grid, UTM 11N, NAD 83

Site: Blythe

DESERT TORTOISE FIELD SURVEY DATA SHEET - FOCUSED SURVEY

Date: _____

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Easting Start	Easting End	Map #	Survey-or	GPS (Data)	Additional Surveyors and GPS Units	

	Time	Temp	Wind Sp/Dir	Weather & % Cloud
Start				
Mid-day				
End				

GPS Ident Code	GPS Easting**	GPS Northing**	Species	Comments	CLASS (1-5)	Burrow Suitable for (√=Yes): DT?	Wbo ?	Kfox ?	Badg ?
BDPGL ~~010~~ 011	706257	3722482	DT	Potential tortoise pallet. rock pallet 18" x 15" 2ft. deep	5	✓			
BDBGL 015	706201	3722512	DT	active ~~potential~~ tortoise burrow. ~~no~~ active, scat turns to left, can't see the end. 24"x6"	1	✓			
			DS	scat. 1.5" x 1" tightly packed	3				
BDBAD005	706191	3722532	DT	rock burrow. 24" x 12"	5	✓	✓		
BDBGL016	706162	3722479	DT	active tortoise burrow. scat inside large burrow. 18" x 10" can't see end of burrow	1	✓			
				scat. 1" x .5" loose. blackish	4				
BDCAD012	706389	3722086	DT	1 tortoise burr. 1cm x 1.5cm. not mineralized	5				
BDPGL012	706510	3721989	DT	potential tortoise pallet. rock pallet 25" x 15", multiple pallets in area	5	✓			
BDPGL013	706797	3721966	DT	potential tortoise pallet. rock pallet 40" x 30"	5	✓			
BDBAD006	707037	3721979	DT	tortoise ~~pallet~~ burrow & a rock pallet 5m away. Burrow - 12" x 6"	5	✓			

*See Reverse and Complete Data Sheet for Desert Tortoises for ALL LIVE TORTOISES!!!

**Coordinate Grid, UTM 11N, NAD 83

Site: Blythe

DESERT TORTOISE FIELD SURVEY DATA SHEET - FOCUSED SURVEY

Date: _____

Easting Start	Easting End	Map #	Survey-or	GPS (Data)	Additional Surveyors and GPS Units	

	Time	Temp	Wind Sp/Dir	Weather & % Cloud
Start				
Mid-day				
End				

GPS Ident Code	GPS Easting**	GPS Northing**	Species	Comments	CLASS (1-5)	Burrow Suitable for (√=Yes): DT?	Wbo ?	Kfox ?	Badg ?
BDPAD015	706911	3722009	DT	rock pallet. potential for tortoise 12" x 6"	5	✓			
BDBAD007	707404	3722062	DT	~~Active~~ tortoise burrow. rock burrow. ~~scat inside, could track it~~ 10"x5"	5	✓	✓		
				rock pallet about 15m away					
BDCAD013	708066	3722019	DT	1 piece of tortoise bone. from adult. piece of marginal. 2"x1.5"	5				

*See Reverse and Complete Data Sheet for Desert Tortoises for ALL LIVE TORTOISES!!!

**Coordinate Grid, UTM 11N, NAD 83

705350
705580

Small rectangle east side

711570	✓	705350	✓	705290	✓	705230	✓	705170	✓	705110	✓	705050	✓		
560	✓	340	✓	280	✓	220	✓	160	✓	100	✓	040	✓		
550	✓	330	✓	270	✓	210	✓	150	✓	090	✓	030	✓		
		320	✓	260	✓	200	✓	140	✓	080	✓	020	✓		
		310	✓	250	✓	190	✓	130	✓	070	✓	010	✓		
		300	✓	240	✓	180	✓	120	✓	060	✓	000	✓		

DESERT TORTOISE FIELD SURVEY DATA SHEET - FOCUSED SURVEY

Site: Blythe - small east parcels / linear buffer, west shape Date: 3/31/2010 Page 1 of 2

Easting Start	Easting End	Map #	Survey-or	GPS (Data)	Additional Surveyors and GPS Units	
			DT	GTF4	BH SMD	
					MR SM16	

air/gnd

	Time	Temp	Wind Sp/Dir	Weather & % Cloud
Start	8:00 AM	65°F / 61°F	1-2 mph E	Cool, overcast, 85%
Mid-day	12:00 PM	79°F / 91°F	3-6 mph NE	Clear, 15%
End	3:40 PM	78°F / 82°F	12-16 mph NE	Windy, hazy, 75%

GPS Ident Code	GPS Easting**	GPS Northing**	Species	Comments	CLASS (1-5)	Burrow Suitable for (√=Yes): DT?	Wbo ?	Kfox ?	Badg ?
BOODT001	712699	3727064		Depression in old disused ag field, evidence of ponding, potential for spadefoot					
BLSBH004	711570	3728187	LS	1 male singing in ironwood tree					
BHMMR002	712298	3727218	HM	4 plants					
BMABH010	711509	3726578	MA	11in wide x 6.5 tall, 30 inches deep. Inactive burrow, could house tortoise and suitable for burrowing owl		✓	✓		
BLSBH005	712296	3727144	LS	Single bird. Perched on a Palo Verde					
BDSBH003	705296	3727559	DS	10in w x 7.5in H x 30in deep. Annual vegetation in entrance, No disturbed soil. Not active. Burrow in consolidated wash bank with cobble. Burrow long lasting.	2				
BMABH011	705302	3727601	MA	10" w x 7.5" H x unknown depth. inactive canid dig.	✓	✓			
BMABH012	705246	3727646	MA	12" w x 10.5 in H x 22 in deep. Not active. Rodent hole leaves from back (at 22 in). true end not seen.		✓			

***See Reverse and Complete Data Sheet for Desert Tortoises for ALL LIVE TORTOISES!!!**

****Coordinate Grid, UTM 11N, NAD 83**

Black-tailed gnatcatcher
Rock wren
House finch
Common Poor-will

Macgillivary's Warbler
Black phoebe
Common yellowthroat
Abert's Towhee

Loggerhead shrike
Northern Mockingbird
Gambel's quail
Verdin
Turkey Vulture

White-crowned sparrow
Black-throated sparrow
Red-tailed Hawk
mourning dove
White-winged dove

DESERT TORTOISE FIELD SURVEY DATA SHEET - FOCUSED SURVEY

Site:_____ Date: _____ Page 2 of 2

Easting Start	Easting End	Map #	Survey-or	GPS (Data)	Additional Surveyors and GPS Units	

	Time	Temp	Wind Sp/Dir	Weather & % Cloud
Start				
Mid-day				
End				

GPS Ident Code	GPS Easting**	GPS Northing**	Species	Comments	CLASS (1-5)	Burrow Suitable for (√=Yes): DT?	Wbo ?	Kfox ?	Badg ?
BMABH013	705058	3727800	MA	Mammal based on size and shape of spoil pile (long & narrow). Partially collapsed entrance. inactive. 11in W x 9in H & end unknown		✓	✓	✓	✓
BGBBH001	705049	3727806	GB	Recently active Badger Burrow. Claw marks visible on burrow roof.		✓	✓	✓	✓

*See Reverse and Complete Data Sheet for Desert Tortoises for ALL LIVE TORTOISES!!!
**Coordinate Grid, UTM 11N, NAD 83

Site: Blythe

DESERT TORTOISE FIELD SURVEY DATA SHEET - FOCUSED SURVEY

Date: 3/31/10

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Easting Start	Easting End	Map #	Survey-or	GPS (Data)	Additional Surveyors and GPS Units	
3/4 of 1 mile buffer			AD	15	GL	11

	Time	Temp	Wind Sp/Dir	Weather & % Cloud
Start	8:17am	63°F	3-7mph	85% cc
Mid-day	3:43pm	77°F	10-20mph	60% cc
End	6:07pm	69°F	16-23mph	30% cc

GPS Ident Code	GPS Easting**	GPS Northing**	Species	Comments	CLASS (1-5)	Burrow Suitable for (√=Yes): DT?	Wbo ?	Kfox ?	Badg ?
BDBAD001	705050	3723585	DT	Active tortoise burrow with tracks and scat. 10"x5". rock burrow, up mountain	1	✓			
				scat. 1"x1" tightly packed	3				
BDBGL017	705036	3723562	DT	Active tortoise burrow! rock burrow. 8 tortoise scats inside. burrow narrows but tortoise back of burrow	1	✓			
				(also pallet near w/ tracks) scat. biggest piece is 1"x1" scat tightly packed. 2"x1" smallest is .5"x.5" scat	3				
BDPAD016	705054	3723557	DT	tortoise pallet with recent activity 13"x7". rock pallet. multiple pallets in area	1	✓			
BDBGL018	705035	3723546	DT	potential tortoise burrow. large, in rocky area. no sign. 30"x10" 3ft. deep	5	✓			
BDPAD017	705046	3723540	DT	tortoise pallet. 10"x5". rock pallet no sign	5	✓			
BDPAD018	705049	3723523	DT	definite tort pallet. rock pallet 8"x4". another pallet 10m away	2	✓			
BDPAD019	705052	3723500	DT	rock pallet. 12"x6". recent use.	2	✓			
BDBGL019	705040	3723479	DT	active tortoise burrow w/ tracks & scat at top of mountain. lots of scat. cactus end of burrow	1	✓			

*See Reverse and Complete Data Sheet for Desert Tortoises for ALL LIVE TORTOISES!!!

**Coordinate Grid, UTM 11N, NAD 83

red tailed hawk, rock wren, side blotched, yellow-rumped warbler, black tailed gnat catcher

grey fox

Site: Blythe

DESERT TORTOISE FIELD SURVEY DATA SHEET - FOCUSED SURVEY

Date: 3/31/10

Easting Start	Easting End	Map #	Survey-or	GPS (Data)	Additional Surveyors and GPS Units	
3/4 x 1 mile buffer			AD	15	GL	11

	Time	Temp	Wind Sp/Dir	Weather & % Cloud
Start				
Mid-day				
End				

GPS Ident Code	GPS Easting**	GPS Northing**	Species	Comments	CLASS (1-5)	Burrow Suitable for (√=Yes): DT?	Wbo ?	Kfox ?	Badg ?
				Scat. tightly packed. light brown. about 5 pieces. largest 3"x1"	3				
BDPAD020	705116	3723483	DT	potential tortoise pallet. entrance flattened 9"x6". perfect tortoise shape.	2	✓			
BMAGL002	705206	3723417	MA	mammal burrow. potential for tortoise gray fox scat inside. 7"x6". very deep		✓			
BDBGL020	705354	3723310	DT	tortoise burrow. bottom of mountain tracks (possibly tortoise) pallet 10m away	2	✓			
				15"x12" very deep. turns left. cant see the end					
BDPGL014	705086	3723085	DT	large tortoise pallet in wash. fresh tracks inside. plastron marks in dirt 20"x18"	1	✓			
BDBAD012	705056	3723078	DT	Active tortoise burrow. tortoise inside. 15"x7". 3 pallets across wash	1	✓			
BDLAD001	705057	3723077	DT	adult male tortoise in BDBAD012. see health sheet MCL about 10"					
BDBGL021	705067	3723083	DT	active tortoise burrow with fresh tracks + scat inside 12"x7"	1	✓			
BDPGL015	705037	3723031	DT	4 tortoise pallets. 1 is active. fresh tracks + plastron marks.	1	✓			

*See Reverse and Complete Data Sheet for Desert Tortoises for ALL LIVE TORTOISES!!!

**Coordinate Grid, UTM 11N, NAD 83

Site: Blythe

DESERT TORTOISE FIELD SURVEY DATA SHEET - FOCUSED SURVEY

Date: 3/31/10

Easting Start	Easting End	Map #	Survey-or	GPS (Data)	Additional Surveyors and GPS Units	
3/4 + 1 mile ~~before~~			AD	15	GL	11

	Time	Temp	Wind Sp/Dir	Weather & % Cloud
Start				
Mid-day				
End				

GPS Ident Code	GPS Easting**	GPS Northing**	Species	Comments	CLASS (1-5)	Burrow Suitable for (√=Yes): DT?	Wbo ?	Kfox ?	Badg ?
BDCGL023	705034	3723031	DT	1 piece of old tortoise bone. not mineralized. 1"x1"	5				
BDCGL024	704920	3723120	DT	1 piece of tortoise bone. Marginal piece from plastron. 2"x1". from adult tortoise	5				
BDBGL022	704614	3723458	DT	~~two~~ tortoise burrow with 4 old tortoise scats. ~~no evidence~~ 9"x7", pellet 5m away	1 ~~2~~	✓			
				scat. 4 pieces. largest is 2"x1" smallest is .5"x.5". tightly packed	3				
BDBAD013	704606	3723495	DT	tortoise burrow. 8"x5" cant see the end. halfway up Mountain.	2	✓			
BDBAD015	704553	3723608	DT	juvenile tortoise burrow. 4"x2". scat inside burrow. well developed berm. 4 pellets in area	1	✓			
				scat. .25" x .25" scat from juvenile tortoise	2				
BDBGL023	706635	3721676	DT	old tortoise burrow. partially collapsed. piece of tortoise eggshell. Kit fox scat in area. 6"x4" ~~[illegible]~~ used to be bigger. 2 burrows total. definitely tortoise	~~4~~ 3	✓			
BDBAD014	706350	3722006		tortoise burrow with recent activity 13"x6", cant see the end	1	✓			

*See Reverse and Complete Data Sheet for Desert Tortoises for ALL LIVE TORTOISES!!!

**Coordinate Grid, UTM 11N, NAD 83

Site: Blythe

DESERT TORTOISE FIELD SURVEY DATA SHEET - FOCUSED SURVEY

Date: 3/31/10

Easting Start	Easting End	Map #	Survey-or	GPS (Data)	Additional Surveyors and GPS Units	
3/4 of 1 mile buffer			AD	15	GL	11

	Time	Temp	Wind Sp/Dir	Weather & % Cloud
Start				
Mid-day				
End				

GPS Ident Code	GPS Easting**	GPS Northing**	Species	Comments	CLASS (1-5)	Burrow Suitable for (√=Yes): DT?	Wbo ?	Kfox ?	Badg ?
BDPGL016	706299	3722067	DT	tortoise pallet. in wash 12"x7" no recent use but def. tort	2	✓			
BDPGL017	706156	3722070	DT	large tortoise pallet. 32"x15" no sign. flat bottom. front of pallet flattened.	*5	✓			
BDBGL024	706109	3722106	DT	tortoise burrow. 14"x6". can't see end. def. tortoise no recent sign	2	✓			
BDPGL018	705092	3722993	DT	large rock pallet. potential for tortoise 36"x 20"	5	✓			

*See Reverse and Complete Data Sheet for Desert Tortoises for ALL LIVE TORTOISES!!!

**Coordinate Grid, UTM 11N, NAD 83

DATA SHEET/HEALTH PROFILE FOR LIVE DESERT TORTOISES

Site Blythe
Located by Arthur Davenport
UTMs 705057 n 3723077 e

GPS Tortoise ID # BDLAD001
Date 3/31/10
Time 11:05am Ground Temp 108°F

Tortoise Data
Body Measurements
MCL (mm) 254 PLN (mm) _____
New growth ☐ Yes ☐ No
Sex: male

Burrow Data
GPS ID # BDBAD012
Orientation south facing
Length _____ Width 12" Height 6"
UTMs 705056 n 3723078 e

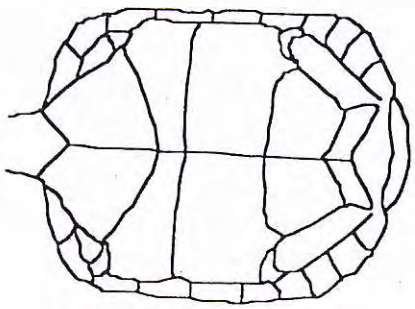
Cover Type	At cover site:	Not at cover site:	Tortoise Activity	Behavior Notes
☑ burrow	☑ inside	☐ in open	☐ resting	working on his burrow
☐ pallet	☐ entering	☐ other	☐ basking	
☐ shrub	☐ exiting		☐ walking	
☐ caliche	☑ on mound		☐ feeding	
☐ rock shelter			Food item	has been feeding, green mouth from veg
			☐ interacting with other tortoise ↓	
			Other DT	
			Describe Interaction	

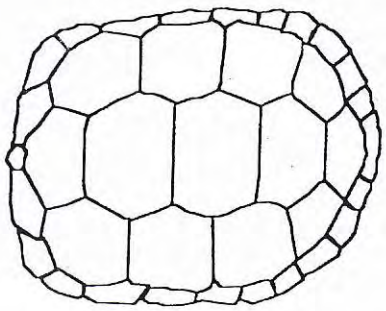
Posture/Behavior	Yes	No	Unk
Alert, responsive	☑	☐	☐
Activity normal for season	☑	☐	☐
Lethargic	☐	☑	☐
Limbs/head hanging loose	☐	☑	☐
Can withdraw tightly into shell	☑	☐	☐

Trauma?	Yes	No	Unk
Head	☐	☑	☐
Gular	☐	☑	☐
Forelimbs	☐	☑	☐
Hindlimbs	☐	☑	☐
Shell	☐	☑	☐
Scute/bone replacement	☐	☑	☐
Integument	**Yes**	**No**	**Unk**
Dull	☐	☑	☐
Glossy	☑	☐	☐
Normal elasticity	☑	☐	☐
Skin peeling	☐	☑	☐

Breathing	Yes	No	Unk
Smooth	☑	☐	☐
Wheezing	☐	☑	☐
Rasping, clicking	☐	☑	☐
Eyes	**Yes**	**No**	**Unk**
Eyelids swollen	☐	☑	☐
Eyes whitened or discolored	☐	☑	☐
Eyes/lids wet	☐	☑	☐
Discharge	☐	☑	☐
Eyes sunken	☐	☑	☐
Eyes clear, bright	☑	☐	☐
Eyes dull, cloudy	☐	☑	☐

Beak & Nares	Yes	No	Unk
Wet	☐	☑	☐
Damp	☐	☑	☐
Exudate Present	☐	☑	☐
Bubbles	☐	☑	☐
One nare occluded	☐	☑	☐
Both occluded	☐	☑	☐
Dirt on nose/beak	☐	☑	☐
Dirt in nares	☐	☑	☐





Skinny, intact gular

DESERT TORTOISE FIELD SURVEY DATA SHEET - FOCUSED SURVEY

Site: Blythe 1 mile & 3/4 mile buffer Date: 4/1/2010 Page 1 of 2

Easting Start	Easting End	Map #	Survey-or	GPS (Data)	Additional Surveyors and GPS Units	
			DT	GTF4	GL SMI	

	Time	Temp	Wind Sp/Dir	Weather & % Cloud
Start	9:05 AM	60°F	1-4 mph	Overcast, 95%
Mid-day	1:20 PM	74°F	0-2 mph S	Clear, 5%
End	3:45 PM	77°F	5-9 mph NW	Clear, 5%

GPS Ident Code	GPS Easting**	GPS Northing**	Species	Comments	CLASS (1-5)	Burrow Suitable for (√=Yes): DT?	Wbo ?	Kfox ?	Badg ?
BDPDT003	704433	3723770	DT	3 pallets within 5 meters in side of wash. 14 in. x 8 in. ~18 in. deep. No sign of recent activity		√			
BBCGL001	704415	3723886	Barrel cactus	1 cactus, 21 inches tall					
BBCDT001	704392	3724006	Barrel cactus	1 cactus, 6 heads, ~23 inches tall					
BBCGL002	704364	3724085	Barrel cactus	1 cactus, 19 inches tall					
BBCDT002	704364	3724143	Barrel cactus	2 cacti ~2 meters apart, ~24 in. tall. Approximately 20 more barrel cactus visible on					
—				steep slopes of mountain within ~200 meters.					
BMADT008	704307	3724515	MA	Small cavern in rockface on steep slope of mountain, ~36 in. x 36 in, narrows but end		√			
—				not seen. Canid scat at entrance, floor of burrow rocky.					
BDPGL019	704304	3724972	DT	3 potential pallets in rock, good condition, possibly tortoise		√			
BDPDT004	704238	3725131	DT	2 rock shelters, possible tortoise pallets, 12 x 8 in.		√			

*See Reverse and Complete Data Sheet for Desert Tortoises for ALL LIVE TORTOISES!!!

**Coordinate Grid, UTM 11N, NAD 83

Violet-green swallow
Red-tailed hawk
Gambel's quail
Lesser nighthawk
Northern mockingbird
Side-blotched lizard
Turkey vulture

DESERT TORTOISE FIELD SURVEY DATA SHEET - FOCUSED SURVEY

Site: Blythe 1 mile & 3/4 mile buffer Date: 4/1/2010 Page 2 of 2

Easting Start	Easting End	Map #	Survey-or	GPS (Data)	Additional Surveyors and GPS Units	

	Time	Temp	Wind Sp/Dir	Weather & % Cloud
Start				
Mid-day				
End				

GPS Ident Code	GPS Easting**	GPS Northing**	Species	Comments Tortoise was	CLASS (1-5)	Burrow Suitable for (√=Yes): DT?	Wbo ?	Kfox ?	Badg ?
BDCGL025	704183	3725925	DT	adult female carcass. At least 20 yrs old. 9.5 mcl, some scutes still attached.	4				
BDBGL025	704106	3726202	DT	Possible tortoise burrow, 6 pallets in side of wash within ~20m. Burrow ~11x6in,	5	√	√		
				30 inches deep. No sign of recent activity.					
BDPDT005	704145	3726203	DT	Large rock shelter, 40x12 in opening in side of wash, no evidence of recent activity,		√			
BDPDT006	704629	3725568	DT	Large rock shelter on steep slope, 24x36 in opening, ~4 ft. deep.		√			
BDPGL020	704749	3724690	DT	30x18 in. rock pallet ~20 in deep, no sign of recent use.		√			
BDPGL021	704756	3724182	DT	4 possible pallets in rock face on steep slope. No sign of use.		√			
BDBGL026	704765	3724145	DT	8x5 in, ~2 feet deep. At ridgeline of steep, rocky slope.	5	√			

*See Reverse and Complete Data Sheet for Desert Tortoises for ALL LIVE TORTOISES!!!
**Coordinate Grid, UTM 11N, NAD 83

705

570	X	630	X	690	X	750	X	810	X	870	X	372-6970	X	930	X
580	X	640	X	700	X	760	X	820	X	880	X	960	X	900	X
590	X	650	X	710	X	770		830	X	890	X	950	X	930	X
600	X	660	X	720	X	780	X	840	X	900	X	940	X	880	X
610	X	670	X	730	X	790	X	850	X	910	X	930	X	870	X
620	X	680	X	740	X	800	X	860	X	920	X	920	X	910	X

870
860
950
840
830

DESERT TORTOISE FIELD SURVEY DATA SHEET - FOCUSED SURVEY

Site: BLYTHE

Date: 4/1/10
01 April 2010

Page 1 of 1

Easting Start	Easting End	Map #	Survey-or	GPS (Data)	Additional Surveyors and GPS Units	
705570			MR	SM15	AD	SM 16

	Time	AIR/GROUND Temp	Wind Sp/Dir	Weather & % Cloud
Start	8:00	55 → 59°	0 → 0.8 / W	99% cloud
Mid-day	13:30	69.5 / 81.5	2.9 → 4.3 / SSE	10% cloud
End	16:15	73 / 80.6	2.0 → 4.0 / S	4% cloud

10

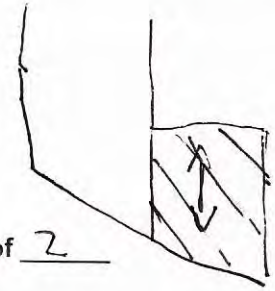
GPS Ident Code	GPS Easting**	GPS Northing**	Species	Comments	CLASS (1-5)	Burrow Suitable for (√=Yes): DT?	Wbo ?	Kfox ?	Badg ?
BDCMR012	0705619	3727237	DT	5 pieces non mineralized parts of plastron 3 X 4 centimeters	5				
BMAMR005	0705827	3727169	MA	under Ironwood TREE, NO SCAT OR TRACKS		✓	✓	✓	✓
BMAMR006	0705858	3727163	MA	2 feet deep North facing 10 feet above wash in 45 degree slope, some old whitewash		✓	✓		
BDCAD014	0705919	3726947	DT	Appears to be female, found in cobble wash near IRONWOOD approx. 12 pieces, Adult	5				
BDCAD015	0705598	3727254	DT	2 TORTOISE LIMB BONES DISARTICULATED IN WASH	5				
BDCAD016	0705910	3726352	DT	14 PIECES FROM Adult Tortoise all less than 1 INCH. Between Desert Pavement and wash	5				
BDBMR004	0705891	3725479	DT	ROCK SHELTER 3 DT BONES FOUND WITHIN 2 METERS, DISARTICULATED (5)	2	✓		✓	✓
BDBMR005	0705830	3725681	DT	12 W X 7 TALL (INCHES) with A PALLET NEARBY, NORTH FACING IN A CONGLOMERATE OF COBBLE	2	✓	✓	✓	✓

*See Reverse and Complete Data Sheet for Desert Tortoises for ALL LIVE TORTOISES!!!
**Coordinate Grid, UTM 11N, NAD 83

Herps - SIDE BLOTCHED LIZARD
whiptail
Zebra-Tailed
Speckled Rattlesnake

Birds - Ash Throated Flycatcher
Black Throated Sparrow
Yellow rumped warbler
Common Poorwill
Turkey Vulture

570	BH	630	RK	690	AD	750	MR	810	BH	870	RK				
580	RK	640	BH	700	MR	760	AD	820	RK	880	BH				
590	MR	650	BH	710	RK	770	AD	830	MR	890	BH				
600	AD	660	RK	720	BH	780	MR	840	AD	900	RK				
610	AD	670	MR	730	BH	790	RK	850	AD						
620	MR	680	AD	740	RK	800	BH	860	MR						



Site: Blythe

DESERT TORTOISE FIELD SURVEY DATA SHEET - FOCUSED SURVEY

Date: 01 April 2010

Page 1 of 2

Easting Start	Easting End	Map #	Survey-or	GPS (Data)	Additional Surveyors and GPS Units	
705570			JBH	Sm-E	JBH.	Sm-F

	Time	Temp (°F) Air / ground	Wind Sp/Dir (mph)	Weather & % Cloud
Start	0800	55.0/59.0	0-.8/W.	99% C.C
Mid-day	1330	68.5/81.5	2.9-4.3/S.SE	10% C.C
End	1615	73.0/80.6	2.0-4.0/S.SE	4% C.C.

GPS Ident Code	GPS Easting**	GPS Northing**	Species	Comments	CLASS (1-5)	Burrow Suitable for (√=Yes): DT?	Wbo ?	Kfox ?	Badg ?
BKBRK002	705818	3727084	KB	9" W x 11" H x end unknown. Recently active but no fresh tracks (soil covers		✓	✓	✓	
				this year's annual vegetation) At the base of a small, narrow drainage.					
BDCBH006	705888	3727037	DC.	1.75 in x 1.0 in piece of fractured tortoise bone. Time since death ≥ 4	↑				
				years but still recent (not mineralized). Suture seam obvious. In a small wash	5				
BDBBH004	705883	3725483	DB	Excellent Rock Shelter. 18 in W x 10 in H x 40 in Deep. No evidence of Recent	2	✓			
				use. Located in a large Rock pile. Flat bottom & contoured sides provide					
				evidence of tortoise use in the past.					

*See Reverse and Complete Data Sheet for Desert Tortoises for ALL LIVE TORTOISES!!!

**Coordinate Grid, UTM 11N, NAD 83

Black-throated Sparrow
Ruby-Crowned Kinglet.
Costa's Hummingbird
Ash-throated flycatcher
Yellow-rumped Warbler
Poorwill (Common)
Cactus Wren

3726970	AD	3726910	AD	3726850	BH	3726790	RK	3726770	MR	3726670	AD	3726610	BH	3726550	BH
960	MR	900	MR	840	RK	780	BH	720	AD	660	MR	600	RK	540	RK
950	RK	890	MR	830	AD	770	BH	710	RK	650	MR	590	MR	530	RK
940	BH	880	AD	820	MR	760	RK	700	BH	640	AD	580	AD	520	BH
930	BH	870	RK	810	MR	750	AD	690	BH	630	RK	570	MR	510	AD
920	RK	3726860	BH	800	AD	740	MR	680	RK	620	BH	560	AD	500	MR

DESERT TORTOISE FIELD SURVEY DATA SHEET - FOCUSED SURVEY

Site: Blythe

Date: 01 April, 2010

*These transects were walked E ↔ W (East) (West)

Page 2 of 2

Easting Start	Easting End	Map #	Survey-or	GPS (Data)	Additional Surveyors and GPS Units

	Time	Temp	Wind Sp/Dir	Weather & % Cloud
Start				
Mid-day				
End				

GPS Ident Code	GPS Easting**	GPS Northing**	Species	Comments	CLASS (1-5)	Burrow Suitable for (√=Yes): DT?	Wbo ?	Kfox ?	Badg ?
No5: Rectangle				3726490 MR					
705940 RK	*These transects			480 AD					
5930 BH	were walked			470 BH					
~~5920 MR~~				460 RK					
5910 AD.	North ↔ South			450 RK					
400 - AD				440 BH					
390 - MR				430 AD					
380 - BH.				420 MR					
370 - RK.				410 MR					
				3726400 AD					
~~29~~ 810				390 BH					
850 South of road				380 RK					
840 = Art ? Mike				370 RK					
830 North = Rebecca				360 BH					
? Brooks				350 AD					
				340 MR					

~~*See Reverse and Complete Data Sheet for Desert Tortoises~~ for ALL LIVE TORTOISES!!!

**Coordinate Grid, UTM 11N, NAD 83

~~Left S.W before turn N 3726580~~

~~Left S.W (Top of triangle): 3726340 - MR.~~

Site: BLYTHE S-10 SUBSTATION ONE MILE BUFFER

DESERT TORTOISE FIELD SURVEY DATA SHEET - FOCUSED SURVEY

Date: April 2, 2010

Easting Start	Easting End	Map #	Survey-or	GPS (Data)	Additional Surveyors and GPS Units	
			CG	SME	DT GTF4	

	Time	Temp	Wind Sp/Dir		Weather & % Cloud
Start	08:30	55°	1	VARIABLE	~~VARIABLE~~ HIGH CLOUD 25%
Mid-day	13:30	77	3-6	W	HIGH WISPY ~ 25%
End	16:45	79	1	SW	~~O~~ HIGH OVERCAST 80%

GPS Ident Code	GPS Easting**	GPS Northing**	Species	Comments	CLASS (1-5)	Burrow Suitable for (√=Yes): DT?	Wbo ?	Kfox ?	Badg ?
BHMDT001	0704132	3720694		≈ 12 INDIVIDUALS / EPHEMERAL WASH					
BMACG001	0704057	3720764		15cm x 15cm x 1+M		X	X	X	X
BHMDT002	0702476	3720990		≈ 20 INDIVIDUALS / DISTURBED AREA PROXIMATE TO I-10 FENCE					
BDCCG001	0702478	3720991	DGTO	3cm x 2cm - SOME SCUTE LINE OLD	5				
BHMDT003	0702420	3720988		≈ 100+ ALONG DISTURBED AREA ADJACENT / JUXTOPOSES TO I-10 FENCE					
BMACG002	0701 ~~0702~~ 713	3720956		FRESH KF SCAT - PRINTS / ACTIVE ≈ 15cm x 15cm		X	X	X	X
BKBDT005	0700408	3719353		≈ 6 OPENINGS TRACKS + OLD SCAT + NEW SCAT		X	X	X	X
BMFDT002	0700411	3719292		SUB ADULT					
BMFDT003	0700425	3718736		ADULT					
BMFDT004	0700435	3718634		SUB ADULT					

*See Reverse and Complete Data Sheet for Desert Tortoises for ALL LIVE TORTOISES!!!

**Coordinate Grid, UTM 11N, NAD 83

Site: BLYTHE

DESERT TORTOISE FIELD SURVEY DATA SHEET - FOCUSED SURVEY

Date: APRIL 2, 2010

Page 2 of 4

Easting Start	Easting End	Map #	Survey-or	GPS (Data)	Additional Surveyors and GPS Units	

	Time	Temp	Wind Sp/Dir	Weather & % Cloud
Start				
Mid-day				
End				

GPS Ident Code	GPS Easting**	GPS Northing**	Species	Comments	CLASS (1-5)	Burrow Suitable for (√=Yes): DT?	Wbo ?	Kfox ?	Badg ?
BMFCG001	0700469	3718253		SUB ADULT					
BMFCG002	0700478	3718137		SUB ADULT					
BMFDT005	0700509	3718067		SUB ADULT					
BMFDT006	0700546	3717980		SUB ADULT					
BMFCG003	0700585	3717843		SUB ADULT					
BDCDT003	0700643	3717778 ~~3717778~~	DETO	1cm x 1cm	5				
ARCH * BPOTCG001	0700650	3717766		10 cm x 10 cm IN DRY EPHEMERAL POND					
BOODT002	0700644	3717774		75m x 50m ORIGINAL POND * POTENTIAL FOR SPADEFOOT					
BDCCG002	0700648	3717765	DETO	1cm x 2cm FRAGMENT	5				
BDCDT004	0700651	3717744	DETO	SCATTERED - THROUGHOUT POUNDING AREA	5				

*See Reverse and Complete Data Sheet for Desert Tortoises for ALL LIVE TORTOISES!!!

**Coordinate Grid, UTM 11N, NAD 83

DESERT TORTOISE FIELD SURVEY DATA SHEET - FOCUSED SURVEY

Site: Blythe Date: April 2, 2010 Page 3 of 4

Easting Start	Easting End	Map #	Survey-or	GPS (Data)	Additional Surveyors and GPS Units	

	Time	Temp	Wind Sp/Dir	Weather & % Cloud
Start				
Mid-day				
End				

GPS Ident Code	GPS Easting**	GPS Northing**	Species	Comments	CLASS (1-5)	Burrow Suitable for (√=Yes): DT?	Wbo ?	Kfox ?	Badg ?
B00DT003	0700710	3717613		MORE DRY PONDS MANY "PONDS" IN AREA					
BMFDT007	0700823	3717486		SUB ADULT					
ARCH * BROCKSCATTER	0700831	3717448		15 M DIAMETER ROCK SCATTER W/HUMP IN MIDDLE					
BMFDT008	0701591	3716996		ADULT					
BMACG003	0702280	3716907		5 OPENINGS 2 15cm x 15cm NO SCAT					
BMFCG004	0702959	3716912		ADULT					
BMFCG005	0703002	3716902		ADULT					
BMACG004	0703828	3717134		COYOTE 35cm x 25cm W/TRACKS					
BHMDT004	0703853	3717142		6 IN A 259 M AREA + 6 MORE ≈ 10M EAST					
BSHDT001	0704614	3719006		3 SOARING MOVING GENERALLY WEST					

*See Reverse and Complete Data Sheet for Desert Tortoises for ALL LIVE TORTOISES!!!

**Coordinate Grid, UTM 11N, NAD 83

Site: BCYTAE

DESERT TORTOISE FIELD SURVEY DATA SHEET - FOCUSED SURVEY

Date: April 2, 2010

Easting Start	Easting End	Map #	Survey-or	GPS (Data)	Additional Surveyors and GPS Units	

	Time	Temp	Wind Sp/Dir	Weather & % Cloud
Start				
Mid-day				
End				

GPS Ident Code	GPS Easting**	GPS Northing**	Species	Comments	CLASS (1-5)	Burrow Suitable for (√=Yes): DT?	Wbo ?	Kfox ?	Badg ?
BMACG006	0704607	3719399 ~~3714~~		SKB ADULT					
BKBCG001	0704550	3720043		OLD KF SCAT 6+ OPENINGS - SOME VEG IN SOME OPENS		X	X	X	X

*See Reverse and Complete Data Sheet for Desert Tortoises for ALL LIVE TORTOISES!!!

**Coordinate Grid, UTM 11N, NAD 83

Start	~~703919~~		~~703921~~													
	703919		3720319													
End	703924		3720312													

Site: Blythe

DESERT TORTOISE FIELD SURVEY DATA SHEET - FOCUSED SURVEY

Date: 4/2/10

Page 1 of 2

Easting Start	Easting End	Map #	Survey-or	GPS (Data)	Additional Surveyors and GPS Units	
[redacted] 703919	~~703924~~ 703921		A. Rivera	SMJ	SMI	Angnichs

	Time	Temp	Wind Sp/Dir	Weather & % Cloud
Start	8:24	61	0-1 / N	30
Mid-day	2:15	78	0-1 / N	20
End				

GPS Ident Code	GPS Easting**	GPS Northing**	Species	Comments	CLASS (1-5)	Burrow Suitable for (√=Yes): DT?	Wbo ?	Kfox ?	Badg ?
BKBMA001	704157	3719870	Kit Fox	6 openings, Kit Fox Scat old			X	X	X
BNHMJR001	704165	3719872	Northern Harrier	300 meters south of location					
BMFMJR001	700883	3718236	MFTL	TWO Sub-Adults					
BMFMA001	700886	3718255	MFTL	~~Two~~ Three Sub-Adults					
BMFMJR002	700847	3718405	MFTL	1 Adult 1 subadult					
BNEMJR001	700832	3718595	Unknown nest	Probably Raptor, at top of powerline structure					
BMFMA002	700852	3719126	MFTL	1 Adult 1 subadult					
BMFMA003	700830	3719164	MFTL	1 Adult					
BMFMJR003	700816	3719275	MFTL	1 ~~subadult~~ 1 juvenile					
BMFMA004	700836	3719523	MFTL	1 Adult					

*See Reverse and Complete Data Sheet for Desert Tortoises for ALL LIVE TORTOISES!!!

**Coordinate Grid, UTM 11N, NAD 83

Site: Blythe

DESERT TORTOISE FIELD SURVEY DATA SHEET - FOCUSED SURVEY

Date: 4/2/10

Page 2 of 2

Easting Start	Easting End	Map #	Survey-or	GPS (Data)	Additional Surveyors and GPS Units	

	Time	Temp	Wind Sp/Dir	Weather & % Cloud
Start				
Mid-day				
End				

GPS Ident Code	GPS Easting**	GPS Northing**	Species	Comments	CLASS (1-5)	Burrow Suitable for (√=Yes):			
						DT?	Wbo ?	Kfox ?	Badg ?
BDCMJR001	0703591	3720602	DT	Bone fragment, 2x1 cm in wash	5				

*See Reverse and Complete Data Sheet for Desert Tortoises for ALL LIVE TORTOISES!!!

**Coordinate Grid, UTM 11N, NAD 83

Northing																
3719550	BH	3719490	BH	3719430	BH	3719370	BH			702030	BH	~~702090~~				
540	RK	480	RK	420	RK	360	RK			040	RK	702090	RK			
530	MR	470	MR	410	MR	350	MR			050	RK	702100	BH			
520	MR	460	MR	400	MR	340	MR			060	BH					
510	RK	450	RK	390	RK	330	RK			070 ~~050~~	BH					
500	BH	440	BH	380	BH	320	BH			080 ~~040~~	RK					

E<->W

DESERT TORTOISE FIELD SURVEY DATA SHEET - FOCUSED SURVEY

Site: Blythe (Sub Station) Date: 02 April, 2010

Page 1 of 2

* Forgot mid-day weather.

Northing Easting Start	Easting End	Map #	Survey-or	GPS (Data)	Additional Surveyors and GPS Units	
3719550	702100		JBH.	SM-C	JBH. →	SM K.A.
					MR →	SM-16

SEE Map of Completed Area on page 2/2.

	Time	Air/ground Temp (°F)	Wind Sp/Dir (mph)	Weather & % Cloud
Start	0945	60.3/64.4	1.1-1.3/S.E	60% C.C.
Mid-day*	1645	77.0/84.2	1.5-5.2/N	90% C.C.
End	1840	70.8/68	3.2-4.3/S.E.	85% C.C.

GPS Ident Code	GPS Easting**	GPS Northing**	Species	Comments	CLASS (1-5)	Burrow Suitable for (√=Yes): DT?	Wbo ?	Kfox ?	Badg ?
BFEBH001	703525	3719590	FE	1 Female/Juvenile Ferruginous Hawk flying overhead, Headed N., N.W.					
BMFMR001	702668	3719522	MF	1 Adult.					
BMFRK001	702041	3719445	MF	1 Adult.					
BMFRK002	702457	3719452	MF	1 Sub Adult					
BMFMR002	702651	3719451	MF	1 Adult					
BMFMR003	702793 ~~707~~	3719457	MF	2 Adults, 1 subadult					
BSWBH001	702788	3719473	SW	1 Swainson's Hawk, ~~soaring~~, gliding. Heading N., NW.					
BMFMR004	702886	3719414	MF	1 Subadult					
BMFMR005	702060	3719413	MF	1 Adult					
BMFMR006	702343	3719398	MF	1 Sub Adult.					

*See Reverse and Complete Data Sheet for Desert Tortoises for ALL LIVE TORTOISES!!!

**Coordinate Grid, UTM 11N, NAD 83

Loggerhead Shrike
American Kestrel
Horned Lark
Black-throated Sparrow
Turkey Vulture
Northern Mockingbird
Red-tailed Hawk
Swainson's Hawk
Ferruginous Hawk
Common Raven
W. Whiptail
Mohave fringe-toed lizard
Shovel-nosed snake

DESERT TORTOISE FIELD SURVEY DATA SHEET - FOCUSED SURVEY

Site: Blythe (Sub Station) Date: 02 April, 2010 Page 2 of 2

Easting Start	Easting End	Map #	Survey-or	GPS (Data)	Additional Surveyors and GPS Units	

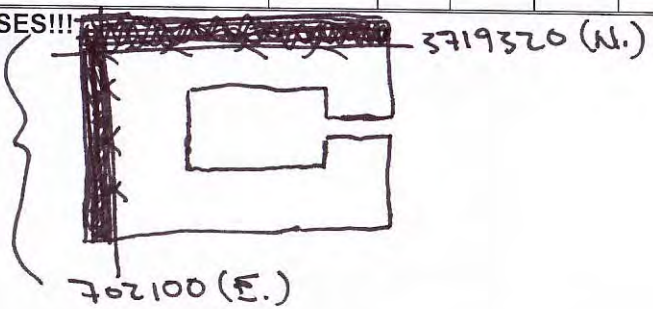
	Time	Temp	Wind Sp/Dir	Weather & % Cloud
Start				
Mid-day				
End				

GPS Ident Code	GPS Easting**	GPS Northing**	Species	Comments	CLASS (1-5)	Burrow Suitable for (√=Yes): DT?	Wbo ?	Kfox ?	Badg ?
BSWBH002	702714	3719391	SW	1 Adult Dark Morph, Soaring and gliding. Heading N.W., 3 light morph birds 5 minutes later, Soaring low (100 ft. off ground) Apparently hunting during migration. (1200 - 1215).					
BMFMR007	703005	3719356	MF	1 Sub Adult					
BLSBH006	702028	3719360	LS	1 Bird. Perched on a Creosote. Calling and Scolding.					
BMFBH004	702815	3719319	MF	1 Adult					
BMFBH005	702989	3719322	MF	1 Sub Adult					
BLSRK001	702054	3718795	LS	1 bird. Perched. Calling.					
BMFRK003	702083	3718559	MF	1 Lizard. Sub Adult					

*See Reverse and Complete Data Sheet for Desert Tortoises for ALL LIVE TORTOISES!!!

**Coordinate Grid, UTM 11N, NAD 83

Rough map of Completed Areas (shaded part)



3725453	SD	✓													
5564	GOSD	✓													
5655	AD	✓													
65	ADV	✓													
75	SD	✓													
85	GL	✓													

DESERT TORTOISE FIELD SURVEY DATA SHEET - FOCUSED SURVEY

Site: Blythe

Date: 4/2/10

Page 1 of 1

Northing Easting Start	Northing Easting End	Map #	Surveyor	GPS (Data)	Additional Surveyors and GPS Units	
3725535	3725585		SDA	D	ADA-15	
					GLU-11	

	Time	Temp	Wind Sp/Dir	Weather & % Cloud
Start	8:33Am	60°F	0 - 1-1 mph W	40% CC
Mid-day	10:50PM	72°F	0 to 4 mph S	10% CC
End				

GPS Ident Code	GPS Easting**	GPS Northing**	Species	Comments	CLASS (1-5)	Burrow Suitable for (√=Yes): DT?	Wbo ?	Kfox ?	Badg ?
BMAAD004	0709471	3725539	mammal	round tailed ground squirrel complex with burrows large enough for Burrowing owl plus additional burrows to east		X	✓	X	X
BHMAD011	0709659	3725566	HMV=	Harwoods milkvetch, one plant					
BDCSD008	0709581	3725575	DT	1"x1", flaking, not mineralized adult	5				
BDCAD017	0709513	3725569	DT	1"x 1/4", mineralized	5				
BDCAD018	0709436	3725564	DT	1"x1", mineralized, possible fossil? adult	5				
BMAGL003	0709349	3725583	mammal	round tailed ground squirrel complex potential for burrowing owl, last for scat		X	✓	X	X
BDCAD019	0709045	3725571	DT	1/4" x 1/4" not mineralized	5				
BDCSD009	0708784	3725576	DT	1/2" x 1/2" not mineralized	5				
BDCAD020	0708514	3725567	DT	3/4" x 1/2" not mineralized	5				

*See Reverse and Complete Data Sheet for Desert Tortoises for ALL LIVE TORTOISES!!!

**Coordinate Grid, UTM 11N, NAD 83

Utah milkweed 0708283/3725131 (5 plants) + 3 more to N

White crowned sparrow, northern mockingbird, yellow rumped warbler, side blotched West coast lady

5 of
3719320
3718970

													E-W						
~~702110~~		702170	X	702230	X	702290	X	702350	X	702410	X	3718670	X	3718610	X	3718550	X
~~120~~		2180	X	2240	X	2300	X	2360	X	2420	X	8660	X	8600	X	8540	X
~~130~~		2190	X	2250	X	2310	X	2370	X	2430	X	8650	X	8590	X	8530	X
~~140~~		2200	X	2260	X	2320	X	2380	X			8640	X	8580	X		
~~150~~		2210	X	2270	X	2330	X	2390	X			8630	X	8570	X		
~~160~~		2220	X	2280	X	2340	X	2400	X			8620	X	8560	X		
														3718980			

703010 X
3000 X
2990 X
2980 X
2970 X
2960 X
2950 X
2940 X
2930 X
2920 X
2910 X
2900 X
2890 X
2880 X
2870 X

DESERT TORTOISE FIELD SURVEY DATA SHEET - FOCUSED SURVEY

Site: Blythe substation Date: 4/3/2010 Page 1 of 4

Easting Start	Easting End	Map #	Survey-or	GPS (Data)	Additional Surveyors and GPS Units	
			DT	GTF4	RK SMA	MA SMI
					BH SMC	MJR SMJ
					CG SME	

	Time	Temp (air/gnd)	Wind Sp/Dir (air/gnd)	Weather & % Cloud
Start	8:20AM	64.1/62.6	1.8-3.0 mph SE	0%, dust, haze
Mid-day	12:50PM	85°F	0-1 mph W	Clear, 1%
End	4:55PM	84°F	3-6 mph NE	Hazy, 20%

GPS Ident Code	GPS Easting**	GPS Northing**	Species	Comments	CLASS (1-5)	Burrow Suitable for (√=Yes): DT?	Wbo ?	Kfox ?	Badg ?
BMFDT009	701928	3718745	MF	1 adult					
BSHMJR001	702934	3719667	SH	3 Swainson's hawks soaring overhead, moving generally west					
BMFDT010	703124	3719363	MF	1 subadult					
BMFMJR004	703156	3719331	MF	1 subadult					
BMFDT011	702552	3718412	MF	1 adult					
BMFMJR005	702444	3718387	MF	1 subadult					
BMFMJR006	702169	3718951	MF	1 subadult					
BMFDT012	702209	3718602	MF	1 subadult					
BMFCG009	702198	3718561	MF	1 subadult					
BMFCG010	702260	3718728	MF	1 adult					

*See Reverse and Complete Data Sheet for Desert Tortoises for ALL LIVE TORTOISES!!!
**Coordinate Grid, UTM 11N, NAD 83

Loggerhead shrike
Swainson's hawk
Cooper's hawk
Raven
Mojave fringe-toed lizard
Sidewinder

DESERT TORTOISE FIELD SURVEY DATA SHEET - FOCUSED SURVEY

Site: Blythe substation + 500ft WBO buffer Date: 4/3/2010 Page 2 of 4

Easting Start	Easting End	Map #	Survey-or	GPS (Data)	Additional Surveyors and GPS Units	

	Time	Temp	Wind Sp/Dir	Weather & % Cloud
Start				
Mid-day				
End				

GPS Ident Code	GPS Easting**	GPS Northing**	Species	Comments	CLASS (1-5)	Burrow Suitable for (√=Yes): DT?	Wbo ?	Kfox ?	Badg ?
BMFCG011	702306	3718632	MF	1 adult					
BMFCG012	702310	3718782	MF	1 subadult					
BMFCG013	702326	3718864	MF	1 subadult					
BMFDT013	702329	3718603	MF	1 subadult					
BMFMJR007	702340	3718568	MF	1 subadult					
BMFCG014	702367	3718615	MF	1 subadult					
BMFMJR008	702635	3718651	MF	1 subadult					
BMFMJR009	702795	3718639	MF	1 subadult					
BMFMJR010	702682	3718642	MF	1 adult					
BMFCG015	702550	3718622	MF	1 adult					

*See Reverse and Complete Data Sheet for Desert Tortoises for ALL LIVE TORTOISES!!!

**Coordinate Grid, UTM 11N, NAD 83

DESERT TORTOISE FIELD SURVEY DATA SHEET - FOCUSED SURVEY

Site: Blythe substation +500 ft. WBO buffer Date: 4/3/2010

Easting Start	Easting End	Map #	Survey-or	GPS (Data)	Additional Surveyors and GPS Units	

	Time	Temp	Wind Sp/Dir	Weather & % Cloud
Start				
Mid-day				
End				

GPS Ident Code	GPS Easting**	GPS Northing**	Species	Comments	CLASS (1-5)	Burrow Suitable for (√=Yes): DT?	Wbo ?	Kfox ?	Badg ?
BMFCG016	702994	3718562	MF	1 subadult					
BMFCG017	702958	3718560	MF	1 subadult					
BMFMJR011	702586	3718579	MF	1 subadult					
BMFDT014	702427	3718563	MF	1 subadult					
BMFCG018	702961	3718550	MF	1 subadult					
BMFMJR012	703008	3718716	MF	1 subadult					
BMFMJR013	703010	3718887	MF	1 adult					
BMFMJR014	702963	3718893	MF	1 subadult					
BMFMJR015	702960	3718700	MF	1 subadult					
BMFCG019	702929	3718667	MF	1 subadult					

*See Reverse and Complete Data Sheet for Desert Tortoises for ALL LIVE TORTOISES!!!

**Coordinate Grid, UTM 11N, NAD 83

DESERT TORTOISE FIELD SURVEY DATA SHEET - FOCUSED SURVEY

Site: Blythe substation + 500 ft WBO buffer Date: 4/3/2010

Easting Start	Easting End	Map #	Survey-or	GPS (Data)	Additional Surveyors and GPS Units	

	Time	Temp	Wind Sp/Dir	Weather & % Cloud
Start				
Mid-day				
End				

GPS Ident Code	GPS Easting**	GPS Northing**	Species	Comments	CLASS (1-5)	Burrow Suitable for (√=Yes): DT?	Wbo ?	Kfox ?	Badg ?
BMFMJR016	702949	3718913	MF	1 subadult					
BMFDT015	702916	3718818	MF	1 subadult					
BMFMJR017	702888	3718703	MF	1 subadult					
BMFDT016	702882	3718801	MF	1 subadult					

*See Reverse and Complete Data Sheet for Desert Tortoises for ALL LIVE TORTOISES!!!

**Coordinate Grid, UTM 11N, NAD 83

N ↕ S

702110	BH			3719310	BH	3719250	BH	3719190	BH						
120	MA			300	MA	240	MA	180	MA						
130	RK			290	RK	230	RK	170	RK						
140	RK	E⇔W		280	RK	220	RK	160	RK						
150	MA			270	MA	210	MA	150	MA						
160	BH			260	BH	200	BH	140	BH						

* ~~SEE~~ Completion map on page 2/2

DESERT TORTOISE FIELD SURVEY DATA SHEET - FOCUSED SURVEY

Site: Blythe (Sub station) Date: 03 April, 2010 Page 1 of 2

Easting Start	Easting End	Map #	Surveyor	GPS (Data)	Additional Surveyors and GPS Units	
			JBH.	SM-C SM-E SM-I	JBH: SM-C	RK-SM-A MA-SM-I

	Time	Temp °F Air / ground	Wind Sp/Dir (m.p.h.)	Weather & % Cloud
Start	0820	64.1 / 62.6	1.8-3.0 / S.E.	0% C.C. / Dust / haze
Mid-day	1320	84.0 / 103.1	6.1-7.8 / S.	25% C.C.
End	1535	85.2 / 84.2	3.3-9.7 / S., SW.	45% C.C.

GPS Ident Code	GPS Easting**	GPS Northing**	Species	Comments	CLASS (1-5)	Burrow Suitable for (√=Yes): DT?	Wbo ?	Kfox ?	Badg ?
BMFBH006	0702001	3719393	MF	1 ADULT					
BMFBH 007	0702136	3719553	MF	1 ADULT					
BMFCG007	702216	3719529	MF	1 Sub Adult					
BMFCG008	702794	3719541	MF	1 Sub Adult					
BMFRK004	702307	3718475	MF	1 Sub Adult					
~~BMFR~~ BCORK001	702011	3718548	CO	3 Adult cooper's Hawks. Accipiter with long Rounded tail. Soaring.					
BMFRK005	702002	3718552	MF	1 Sub Adult					
BMFMA005	702479	3719302	MF	~~1~~ 3 Adults					
BMFMA006	702856	3719267	MF	1 Sub Adult					
BMFBH008	702148	3719199	MF	1 Sub Adult					

*See Reverse and Complete Data Sheet for Desert Tortoises for ALL LIVE TORTOISES!!!
**Coordinate Grid, UTM 11N, NAD 83

Brewer's sparrow Common Raven Cooper's Hawks
N. mockingbird European Sterling

Loggerhead - shrike. (same as yesterday)
Black-throated sparrow Swainson's Hawks (☒☒) ← 20 Hawks between ~~0845~~ 0915-0945

DESERT TORTOISE FIELD SURVEY DATA SHEET - FOCUSED SURVEY

Site: Blythe (Sub Station) Date: 03 April, 2010 Page 2 of 2

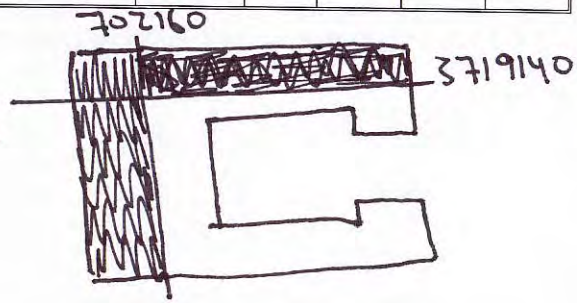
Easting Start	Easting End	Map #	Survey-or	GPS (Data)	Additional Surveyors and GPS Units	

	Time	Temp	Wind Sp/Dir	Weather & % Cloud
Start				
Mid-day				
End				

GPS Ident Code	GPS Easting**	GPS Northing**	Species	Comments	CLASS (1-5)	Burrow Suitable for (√=Yes): DT?	Wbo ?	Kfox ?	Badg ?
BMFMA007	702143	3719069	MF	1 Adult, 1 Sub Adult					
BMFBH009	702174	3719243	MF	1 Adult					
BMFMA008	702315	3719241	MF	1 Sub Adult					
BMFBH010	702869	3719243	MF	2 lizards : 1 Adult, 1 Sub Adult					
BMFMA009	702875	3719205	MF	2 Lizards : Both Sub Adults					
BMFMA010	702415	3719217	MF	2 Sub Adults					
BMFBH011	702609	3719176	MF	1 Sub Adult					
BMFMA011	703020	3719174	MF	2 Sub Adults					

*See Reverse and Complete Data Sheet for Desert Tortoises for ALL LIVE TORTOISES!!!
**Coordinate Grid, UTM 11N, NAD 83

Sub Station Completion Map : 03 April 2010 :



3719140	DT	~~3718980~~		3719040	RK	3718980	BH			3725595	DT	3725655	BH	3725520	DT		
130	BH	3719090	RK	030	MA					3725605	BH	665	DT	490	BH		
120	RK	080	BH	020	MA					615	~~MA~~ RK			460	RK		
110	MA	070	DT	010	RK	Sub Station (completed)				625	RK	MA		430	MA		
100	MA	060	DT	3719000	BH					635	MA			400			
~~3719090~~		050	BH	3718990	DT					645	RK			370			
~~3718990~~														340			
														310			

702660 3719140 3718980 3725585

N. End of Narrow Rectangle

Burrowing Owl Buffer N S

790-DT
709820-BH
~~790~~-RK
RK-850-MA
MA-880-MA
MA-910-RK
RK-940-BH
BH-970-DT
DT-710000

DESERT TORTOISE FIELD SURVEY DATA SHEET - FOCUSED SURVEY

Site: Blythe

Date: 4/4/2010

Page 1 of 1

Easting Start	Easting End	Map #	Survey-or	GPS (Data)	Additional Surveyors and GPS Units	
				All	BH:Sm-C	RK:Sm-A
					DT:GTF-4	MA:Sm-I

	Time	Temp (°F) Air / ground	Wind Sp/Dir (mph)	Weather & % Cloud
Start	0820	64.7 / 62.6	0-.8 / S.E.	0% C.C.
Mid-day	1145	78.1 / 86.0	3.6-7.0 / S	0% C.C.
End	1500	85.4 / 91.4	10.7-15.9 / S.	5% C.C.

GPS Ident Code	GPS Easting**	GPS Northing**	Species	Comments	CLASS (1-5)	Burrow Suitable for (√=Yes): DT?	Wbo ?	Kfox ?	Badg ?
BMFMA012	~~3719~~ 703012	3719088	MF	1 Sub Adult					
BMADT009	709632	3725599	MA	Boarderline Burrowing Owl suitability. Round-tailed Ground Squirrel active					
				colony. Eight burrow openings at this location. Juvenile tortoise suitability.		✓	✓		
BMARK005	708665	3725467	MA	10" w x 9" H x unknown Depth (inches). Coyote scat out front. Inactive.		✓	✓		
BDCDT005	708847	3725516	DC	fossilized Dermal bone with non-familiar scute junction. Possible Cheloniidae.	5				
				Photos taken: Dana Terry					

*See Reverse and Complete Data Sheet for Desert Tortoises for ALL LIVE TORTOISES!!!
**Coordinate Grid, UTM 11N, NAD 83

Sub Station:
Brewer's Blackbird
Red-tailed Hawk.
European Starling
Western Kingbird
Brewer's Sparrow
Black-throated Sparrow
Horned Lark

Blythe:
Turkey Vulture

To pvt property line

707400	X	3726010	X	708220	X	708280	X									
7410	X	26020	X	8230	X	8290	X									
7420	X	26030	X	8240	X											
7430	X	26040	X	8250	X											
7440	X	26050	X	8260	X											
7450	X			8270	X											

To pvt property line

DESERT TORTOISE FIELD SURVEY DATA SHEET - FOCUSED SURVEY

Site: Blythe Private property boundary + west parcels WBO buffer **Date:** 4/5/2010 **Page** 1 **of** 1

Easting Start	Easting End	Map #	Survey-or	GPS (Data)	Additional Surveyors and GPS Units	
			DT	GTF4	MA SMI	CG SME
					MR SMJ	RK SMA
						BH SMC

	Time	Temp	Wind Sp/Dir	Weather & % Cloud
Start	8:10 AM	65°F/64.1°F	4-7 mph NE	Clear, 30%
Mid-day	12:15 PM	76°F	10-20 mph E	Windy, 5%
End	3:45 PM	76.5°F/80.6°F	12.4-24.8 SSE	Windy, 25%

GPS Ident Code	GPS Easting**	GPS Northing**	Species	Comments	CLASS (1-5)	Burrow Suitable for (√=Yes): DT?	Wbo ?	Kfox ?	Badg ?
BDCCG003	707720	3726084	DC	Very old (beginning to mineralize) tortoise scapula bone fragment 2cm x 1cm.	5				
~~BDPCG001~~									
BDPCG001	0705806	3725760	DETO	25cm x 10cm x 30cm DEEP @ WASH SUMMER BURROW / PELLET / WEST ORIEN	5 ~~X~~ C4	X			
BDSDT001	0705872	3725402	DT	2.5x2 cm., slight glaze, some odor, but dry. Scat out in open. Photos taken.	2				
BMACG005	705897	3725474	MA	Rock crevasse, large opening but narrows to ~6x8 in. Some veg in entrance. Some white wash, but may not be WBO. End not seen.		✓	✓		
BDBRK001	705085	3727534	DT	24x8 in, ~2ft deep burrow in side of wash, currently used by woodrat.	4	✓			

*See Reverse and Complete Data Sheet for Desert Tortoises for ALL LIVE TORTOISES!!!

**Coordinate Grid, UTM 11N, NAD 83

DESERT TORTOISE FIELD SURVEY DATA SHEET - FOCUSED SURVEY

Site: Blythe.

Date: 05 April, 2010

Page 1 of 1

Easting Start	Easting End	Map #	Survey-or	GPS (Data)	Additional Surveyors and GPS Units
					RK: Sm-A MR: Sm-J JBH: Sm-C CG: Sm-E

	Time	Temp (°F) Air/ground	Wind Sp/Dir (mph)	Weather & % Cloud
Start				
Mid-day				
End	1545	76.5/80.6	12.4-24.8/S.S.E.	25% cumulus

GPS Ident Code	GPS Easting**	GPS Northing**	Species	Comments	CLASS (1-5)	Burrow Suitable for (√=Yes): DT?	Wbo ?	Kfox ?	Badg ?
BDBBH005	705845	3725366	DB	11"w x 8"H x 30" (Deep) (inches). Rock Shelter. Flat bottom. No evidence of Recent use. Substrate (rock) does not lend to tortoise shape. Probably tortoise because no other animal would excavate rock such as this. No definitive evidence of tortoise, however. Moments after writing the above statement a recent (this spring) tortoise scat was found approximately 40 meters away. Could change to Class 2.	5				
BMAMR007	705107	3727344	MA	2 canid digs 4 feet apart. 17in x 10in x 24" deep. Inactive		✓	✓		
BKBMR005	704865	3727739	KB	2 openings. largest: 18 in w x 18 in H x unknown depth. Based on annual vegetation on spoil, this burrow was active last year. Kit fox scat out front.		✓	✓	✓	✓
BKBBH006	704882	3727846	KB	Exact same sign as above (BKBMR005). 3 openings: 11in w x 10 in H x unknown depth		✓	✓	✓	✓
BKBMR006	704881	3727906	KB	Active kit fox natal complex. Fresh scat and spoil. 4 openings: 5in w x 7in H x unknown.	KB			✓	

*See Reverse and Complete Data Sheet for Desert Tortoises for ALL LIVE TORTOISES!!!

**Coordinate Grid, UTM 11N, NAD 83

Rock wren.
Yellow-rumped warbler
Western Kingbird
Black-throated sparrow
Horned Lark
Common Raven
Brewer's sparrow
Ash-throated flycatcher
Violet-green swallow
Lesser nighthawk
Common poorwill
White-crowned sparrow
Side-blotched lizard
Western whiptail
Patch-nosed snake
Chuckwalla (scat)

DESERT TORTOISE FIELD SURVEY DATA SHEET - FOCUSED SURVEY

Site: Blythe 3/4 & 1 mile buffer Date: 4/6/2010 Page 1 of 3

Easting Start	Easting End	Map #	Survey-or	GPS (Data)	Additional Surveyors and GPS Units	
			DT	GTF4	MR SME	

	Time	Temp	Wind Sp/Dir	Weather & % Cloud
Start	8:15 AM	65°F	4-6 mph SE	Clear, 0%
Mid-day	12:55 PM	78°F	3-6 mph E	Clear, 0%
End	5:10 PM	79°F	9-13 mph S	Clear, 1%

GPS Ident Code	GPS Easting**	GPS Northing**	Species	Comments	CLASS (1-5)	Burrow Suitable for (√=Yes): DT?	Wbo ?	Kfox ?	Badg ?
BDPDT007	706182	3722102	DT	Definitely tortoise, no evidence of recent use. 12"x7", 18" deep, in side of wash in caliche.	2	√			
BDPMR003	706177	3722114	DT	Small rock cavern inside of wash, ~24x24 in, ~12 in deep. Not dug by tortoise but could be used.	5	√			
BDPDT008	706192	3722130	DT	~30x8 in, ~8 in deep, in caliche in side of wash, no evidence of recent use.	5	√			
BDBDT001	706167	3722413	DT	Wide burrow in caliche in bank of wash, 24x8 in, 5 ft deep. Mammal scat inside, no recent tortoise use.	2	√			
BDBMR006	706180	3722417	DT	14x7 in, end not seen. Several old (Class 3) tortoise scats seen inside. No evidence of recent use.	2	√			
				Several potential pallets also in this wash. Scats ~1x½ in.					
BDPMR004	706095	3722628	DT	Large opening in side of wash, 36x8 in, 3 ft. deep, stone cave w/ soft bottom, no sign of use.	5	√			
BDPDT009	706041	3722618	DT	Wide rock cavern on steep, rocky slope, 30x8 in, ~20 in deep. No signs of tortoise use.	5	√			
BDBMR007	706047	3722600	DT	Small rock cavern, 17x7 in, narrows as it goes back but at least 5.5 ft. deep. No signs of tortoise use.	5	√	√		
BDPDT010	706018	3722651	DT	Small rock cavern on steep rocky slope, 11x12 in, 2.5 ft deep, no signs of tortoise use.	5	√			

***See Reverse and Complete Data Sheet for Desert Tortoises for ALL LIVE TORTOISES!!!**

****Coordinate Grid, UTM 11N, NAD 83**

Red-tail hawk
Turkey vulture
Rock wren
Black-throated sparrow

Gambel's quail
Northern mockingbird
Lesser nighthawk
Violet-green swallow
Western whiptail

Side-blotched lizard

DESERT TORTOISE FIELD SURVEY DATA SHEET - FOCUSED SURVEY

Site: Blythe 3/4 & 1 mile buffers Date: 4/6/2010 Page 2 of 3

Easting Start	Easting End	Map #	Survey-or	GPS (Data)	Additional Surveyors and GPS Units	

	Time	Temp	Wind Sp/Dir	Weather & % Cloud
Start				
Mid-day				
End				

GPS Ident Code	GPS Easting**	GPS Northing**	Species	Comments	CLASS (1-5)	Burrow Suitable for (√=Yes): DT?	Wbo ?	Kfox ?	Badg ?
BMAMR008	705852	3722793	MA	Excavation under rock ledge, 30x8 in, ~3ft. deep - Canid and bird scat inside. Possibly gray fox.		√			
BBCDT003	705752	3722929	Barrel cactus	1 cactus, ~9 in tall, dead. 5 other barrel cactus visible on this slope within ~30m.					
BBCMR001	705619	3723188	Barrel cactus	8-10 cacti on south-facing slope approx. 50 m North of this point.					
BDPDT011	705489	3723234	DT	Small rock shelter, 12x7 in, 12 in deep. No sign of tortoise use.	5	√			
BDPDT012	705383	3723290	DT	Shelter under rock ledge, 18x10 in, 18 in deep, soft soil on bottom. No signs of tortoise use.	5	√			
BDPMR005	705501	3723149	DT	Pallet in side of wash, caliche, 12x8 in, 18 in deep. Several other potential pallets in this wash.	5	√			
BDBMR008	705517	3723129	DT	21x6 in, 4ft deep. 3 old scats (class 3) at entrance, scats 1x1/2 inch. Several pallets nearby.	2	√			
BDPMR006	705528	3723177	DT	Rock shelter with soft dirt bottom, south-facing slope.	5	√			
BDPMR007	705541	3723102	DT	Excavation under rock, flat bottom with soft soil, 13x6.5 in, 4ft deep.	2	√			
BNEDT001	705230	3722958		Black-throated sparrow nest in small bush in wash - flushed adult from nest, 4 eggs.					

*See Reverse and Complete Data Sheet for Desert Tortoises for ALL LIVE TORTOISES!!!

**Coordinate Grid, UTM 11N, NAD 83

DESERT TORTOISE FIELD SURVEY DATA SHEET - FOCUSED SURVEY

Site: Blythe 3/4 & 1 mile buffer Date: 4/6/2010 Page 3 of 3

Easting Start	Easting End	Map #	Survey-or	GPS (Data)	Additional Surveyors and GPS Units	

	Time	Temp	Wind Sp/Dir	Weather & % Cloud
Start				
Mid-day				
End				

GPS Ident Code	GPS Easting**	GPS Northing**	Species	Comments	CLASS (1-5)	Burrow Suitable for (√=Yes): DT?	Wbo ?	Kfox ?	Badg ?
BDCMR013	~~706~~ 708982	3722435	DT	Bone fragment, growth line present 3/4 x 3/4 in.	5				
~~BMADT010~~ BDBDT002	709206	3722437	MA	8x8 in, inside of berm along road. End not seen. Flat bottom, no sign of tortoise use.	5	✓	✓	✓	✓
BKBMR007	710373	3724176	KB	Active kit fox complex in small artificial berm. 9 openings, KF scat and tracks.		✓	✓	✓	✓
BHMMR003	710279	3722516	HM	5 plants adjacent to old tarmac within 1 meter					
BHMMR004	710095	3722328	HM	~30 plants within 5m					
BODT004	709461	3722029		Large area of baked earth at base of artificial berm, potential for spadefoot					
BHMMR005	709155	3722004	HM	1 plant					

*See Reverse and Complete Data Sheet for Desert Tortoises for ALL LIVE TORTOISES!!!
**Coordinate Grid, UTM 11N, NAD 83

DESERT TORTOISE FIELD SURVEY DATA SHEET - FOCUSED SURVEY

Site: Blythe: 3/4 & 1.0 mi. buffer Date: 06 April, 2010 Page 1 of 2

Easting Start	Easting End	Map #	Surveyor	GPS (Data)	Additional Surveyors and GPS Units	
					RK: Sm-C	RB: Sm-I
					BH: Sm-A	

	Time	Temp (°F) Air / ground	Wind Sp/Dir (mph)	Weather & % Cloud
Start	0820	62.6/61.2	4.8-7.9/NW	5.0% C.C.
Mid-day	1335	72.6/85.1	1.2-10.9/N.	5.0% C.C.
End	1620	78.7/86.0	7.8-14.5/NW	2.0% CC

GPS Ident Code	GPS Easting**	GPS Northing**	Species	Comments	CLASS (1-5)	Burrow Suitable for (√=Yes): DT?	Wbo ?	Kfox ?	Badg ?
BDCRK003	703917	3726493	DT	Anterior 2/3 of carcass (plastron & carapace). Bone flakes easily, bone beginning to pit.	4				
				Estimated time of death ~ 3-4 years. Female based on size of gular, ~MCL = 250 mm					
				Carcass located on side of drainage					
BDSRB001	703273	3726609	DS	Possible tortoise scat. White color is questionable but scat is composed entirely of soil, gravel and plant material. Very old. photos taken.					
BDBBH006	702554	3727103	DB	Dug out rock shelter. Inactive. Soil floor undisturbed. 24 in W x 30 in D x 10 in H	4	✓			
BDBBH007	702539	3727112	DB	Dug out rock shelter → Same as BDBBH006, better condition. Same dimensions	5	✓			
BDBRK002	702511	3727177	DB	Rock shelter. Dug-out, flat bottom. Best: 13 in W x 10 in H x 36 in deep. inactive	5	✓			
BDBRB001	702492	3727174	DB	Rock shelter is 30 ft. upslope from waypoint BDBRK002: 15 in W x 6" H x 36 D.	4	✓			
BDBRB002	702470	3727217	DB	Rock shelter: 2 openings (either side of rock) in entrance. Deepest cover site: 15 in W x 10 in H x 60 in deep. Clyde's 5 tortoise scat (3 mm wide x 20 mm long)	2	✓			

*See Reverse and Complete Data Sheet for Desert Tortoises for ALL LIVE TORTOISES!!!
**Coordinate Grid, UTM 11N, NAD 83

House finch
White-throated swift
Turkey vulture
Common poorwill
Black-throated sparrow
Rock wren
Common raven
Say's phoebe
Loggerhead shrike
Cliff swallow
Gambel's quail
Ash-throated flycatcher
Lesser nighthawk
Collard Lizard
Side-blotched Lizard
Chuckwalla (scat)

DESERT TORTOISE FIELD SURVEY DATA SHEET - FOCUSED SURVEY

Site: Blythe: 1.0 & 3/4 mile buffer Date: 06 April, 2010 Page 2 of 2

Easting Start	Easting End	Map #	Survey-or	GPS (Data)	Additional Surveyors and GPS Units	

	Time	Temp	Wind Sp/Dir	Weather & % Cloud
Start				
Mid-day				
End				

GPS Ident Code	GPS Easting**	GPS Northing**	Species	Comments	CLASS (1-5)	Burrow Suitable for (√=Yes): DT?	Wbo ?	Kfox ?	Badg ?
BDBBH008	702168	3728555	DB	Rock shelter, flat soil bottom. Old kit fox scat out front but tortoise shape.	4	✓		✓	
				11in W x 9in H x 36 in deep					
BDCRK004	702577	3728374	DC	Old dermal bone fragment with suture line. Time since death > 4yrs. 1½in x 1½in	5				
BDBBH009	702581	3728316	DB	large rock shelter with flat soil bottom 20in W x 12in H x 60 in deep. inactive	4				
BDCBH007	702743	3727527	DC	Plastron and some marginals from a 245 (estimated mcl .. with tape measure)	4				
				female mature tortoise. Bone beginning to differentiate. growth ring peeling. Bone without sheen. (carcass tumbled down rocky drainage)	4				
~~BLS~~									
BLSBH007	704356	3726540	LS	1 bird perched & calling					

*See Reverse and Complete Data Sheet for Desert Tortoises for ALL LIVE TORTOISES!!!
**Coordinate Grid, UTM 11N, NAD 83

DESERT TORTOISE FIELD SURVEY DATA SHEET - FOCUSED SURVEY

Site: Blythe 3/4 & 1 mile buffer Date: 4/7/2010

Page 1 of 2

Easting Start	Easting End	Map #	Survey-or	GPS (Data)	Additional Surveyors and GPS Units	
			DT	GTF4	MR SME	

	Time	Temp	Wind Sp/Dir	Weather & % Cloud
Start	8:00 AM	65°F	10-15 mph S	Windy, clear, 0%
Mid-day	1:20 PM	79°F	6-10 mph S	Clear, 0%
End	5:10 PM	79°F	10-16 mph SE	Windy, clear, 0%

GPS Ident Code	GPS Easting**	GPS Northing**	Species	Comments	CLASS (1-5)	Burrow Suitable for (√=Yes): DT?	Wbo ?	Kfox ?	Badg ?
BMAMR009	710778	3724447	MA	Badger foraging burrow, somewhat deteriorated, ends after ~18 in.					
BMAMR010	710956	3724565	MA	~4x4 in, marginal for WBO. Some veg in entrance.		√	√		
BHMMR006	711172	3724685	HM	5 plants					
BSWMR002	712446	3725824	SW	8 individuals soaring overhead, flying generally west.					
BMADT010	712597	3725424	MA	Round-tail ground squirrel colony, 5-6 openings marginal for WBO.		√	√		
BHMMR007	711839	3724732	HM	2 plants					
BHMDT005	710669	3724041	HM	11 plants					
BHMDT006	713179	3728190	HM	~20 plants in vegetated patch in pavement.					
BHMMR008	713122	3728859	HM	1 plant					
BMAMR011	713146	3729855	MA	Large dig in base of wash, 12x20 in, ends after ~6ft.				√	√

***See Reverse and Complete Data Sheet for Desert Tortoises for ALL LIVE TORTOISES!!!**

****Coordinate Grid, UTM 11N, NAD 83**

- Housefinch
- Yellow-rumped warbler
- Horned lark
- Violet-green swallow
- Raven
- Side-blotched lizard
- Zebra-tailed lizard
- Mourning dove
- Ash-throated flycatcher
- Abert's towhee
- Desert iguana
- Patch-nosed snake
- Northern mockingbird
- Gambel's quail
- Phainopepla
- Swainson's hawk
- Desert woodrat
- Western shovel nosed snake

DESERT TORTOISE FIELD SURVEY DATA SHEET - FOCUSED SURVEY

Site: Blythe 3/4 & 1 mile buffer Date: 4/7/2010

Easting Start	Easting End	Map #	Survey-or	GPS (Data)	Additional Surveyors and GPS Units	

	Time	Temp	Wind Sp/Dir	Weather & % Cloud
Start				
Mid-day				
End				

GPS Ident Code	GPS Easting**	GPS Northing**	Species	Comments	CLASS (1-5)	Burrow Suitable for (√=Yes): DT?	Wbo ?	Kfox ?	Badg ?
BMADT011	713116	3730215	MA	8x8 in, makes right turn and end not seen. Some veg in entrance.		√	√	√	√
BNEMR001	712722	3730458	unknown woodpecker	1 3/8 inch circular nest entrance in dead palo verde in wash, 7.5 feet from ground. * photos taken					
BOOMR001	712707	3727727	Pool	Basin formed by road berm, evidence of ponding, potential for spade foot.					
BOOMR002	713034	3727747	Pool	Basin formed by road berm evidence of ponding, some TAMARISK, potential spadefoot.					

*See Reverse and Complete Data Sheet for Desert Tortoises for ALL LIVE TORTOISES!!!

**Coordinate Grid, UTM 11N, NAD 83

DESERT TORTOISE FIELD SURVEY DATA SHEET - FOCUSED SURVEY

Site: Blythe - Utility Corridor from Valero (Airport Mesa Dr.) to N.<>S. "T" line connect, parallel to I-10

Date: 07 April, 2010

Page 1 of 2

Easting Start	Easting End	Map #	Surveyor	GPS (Data)	Additional Surveyors and GPS Units	
E<>W	utility corridor from Valero to "T" Line Corridor. Main area and Burrowing owl buffer completed. North side of I-10 only.				KB: Sm-I	BH: Sm-C
					RK: Sm-A	

	Time	Temp (°F) Air/ground	Wind Sp/Dir (mph)	Weather & % Cloud
Start	0755	65.1 \ 63.5	1.7-8.6 / N.E.	0% c.c.
Mid-day	1210	76.9 / 84.2	6.4-11.9 / N.	0% c.c.
End	1440	81.1 \ 92.3	3.9-11.2 / N.	0% c.c.

GPS Ident Code	GPS Easting**	GPS Northing**	Species	Comments	CLASS (1-5)	Burrow Suitable for (√=Yes): DT?	Wbo ?	Kfox ?	Badg ?
BHMBH005	709679	3721235	Hm	Harwood's milkvetch. Fruit not densely hairy. Plants with small ~~dark~~ dark purple flowers.	Hm	← 6 plants			
BHMBH006	709514	3721241	Hm	Same features as BHMBH005: ~~10~~ 13 plants. 16+	Hm				
BHMRK001	710107	3721260	Hm	1 plant.					
BHMRK002	710170	3721266	Hm	~~8 plants~~ 60 plants in this area.					
BHMRK003	710326	3721267	Hm	3 plants					
BHMRK004	710491	3721278	~~HL~~ Hm	2 plants.					
BHMRB001	710563	3721305	Hm	4 plants. At the base of an asphalt pile.					
BHMRK005	710033	3721317		8 plants.					

*See Reverse and Complete Data Sheet for Desert Tortoises for ALL LIVE TORTOISES!!!

**Coordinate Grid, UTM 11N, NAD 83

Rock Dove
European Starling
Great-tailed Grackle
Eurasian Collard-dove
Verdin
Yellow-rumped warbler
White-crowned sparrow
House Finch
Common Raven
Black-tailed gnatcatcher
Turkey vulture
Gambel's Quail
Violet-green swallow.
Ash-throated flycatcher.

DESERT TORTOISE FIELD SURVEY DATA SHEET - FOCUSED SURVEY

Site: Solar Millennium - Blythe Date: ~~3-9-10~~ 4-7-10 Page 1 of 1

Easting Start	Easting End	Map #	Survey-or	GPS (Data)	Additional Surveyors and GPS Units	
			Rocky Brown	SM Garmin		

	Time	Temp	Wind Sp/Dir	Weather & % Cloud
Start				
Mid-day	1210	76.9	6.4-11.9/N	warm, 0%, gusty winds
End				

GPS Ident Code	GPS Easting**	GPS Northing**	Species	Comments	CLASS (1-5)	Burrow Suitable for (√=Yes): DT?	Wbo ?	Kfox ?	Badg ?
BHMRB002	708318	3721367	HM	6 plants adjacent to wash + 1 plant ~30 M NW adjacent to creosote bush					
BHMRB003	709589	3721558	HM	>~~80~~ 180 plants in open area w/ widely scattered creosote bush. Plants growing in					
~~BHMRB004~~	~~709650~~	~~3721554~~	~~HM~~	a narrow strip of finer substrate ~1 M wide x 100 M long					
BHMRB004	709650	3721554	HM	14 plants in finer substrate (slightly mounded) w/ substantial herbaceous growth					
BHMRB005	709741	3721538	HM	1 plant in fine substrate w/ other herbaceous species. Scattered creosote bush, bursage & eucelia					
BHMRB006	709811	3721529	HM	1 plant + 15 plants ~26 M ESE					
BHMRB007	709869	3721514	HM	1 plant					
BHMRB008	709956	3721501	HM	5 plants					
BHMRB009	710025	3721806	HM	7 plants					
BHMRB010	710317	3721517	HM	2 plants in disturbed area adjacent to trucking yard					

*See Reverse and Complete Data Sheet for Desert Tortoises for ALL LIVE TORTOISES!!!

**Coordinate Grid, UTM 11N, NAD 83

DESERT TORTOISE FIELD SURVEY DATA SHEET - FOCUSED SURVEY

Site: Blythe

Date: 07 April, 2010

Easting Start	Easting End	Map #	Survey-or	GPS (Data)	Additional Surveyors and GPS Units	

	Time	Temp	Wind Sp/Dir	Weather & % Cloud
Start				
Mid-day				
End				

GPS Ident Code	GPS Easting**	GPS Northing**	Species	Comments	CLASS (1-5)	Burrow Suitable for (√=Yes): DT?	Wbo ?	Kfox ?	Badg ?
B00BH002	710611	3721221		These were areas parallel to I-10, (along the gravel frontage rd.)					
B00BH003	710121	3721209		within or adjacent to the purposed utility corridor, where there					
B00BH004	709943	3721201		are signs of ponding or pools					
B00BH005	709350	3721255		of water that could have lasted for seven or more days. Areas with					
				this sign were intermittent Along the gravel frontage					
				road (just North of the frontage rd.) ← more than the points noted Here.					
				of the points listed here,					
				B00BH005 was the largest and had the most potential					
				for holding water over a long period of time.					

*See Reverse and Complete Data Sheet for Desert Tortoises for ALL LIVE TORTOISES!!!

**Coordinate Grid, UTM 11N, NAD 83

DESERT TORTOISE FIELD SURVEY DATA SHEET - FOCUSED SURVEY

Site: BLYTHE

Date: 4-8-10

Page 1 of 1

Easting Start	Easting End	Map #	Survey-or	GPS (Data)	Additional Surveyors and GPS Units	
713463			RB, MR	E	RB-1	

	Time	Temp	Wind Sp/Dir	Weather & % Cloud
Start	08:10	68	0-1/N	sunny, calm, 0%
Mid-day	12:25	79.5	1-7/N	sunny, slight breeze, 0%
End	16:10	87.8	0-4.8/N	sunny, slight breeze, 0%

GPS Ident Code	GPS Easting**	GPS Northing**	Species	Comments	CLASS (1-5)	Burrow Suitable for (√=Yes): DT?	Wbo ?	Kfox ?	Badg ?
BNHMR001	714802	3724469	NH	Off site. Make flying low across road.					
BHMMR009	713327	3730613	~~HW~~ HM	2 plants in open area w/ sparse vegetative cover					
BDCRB003	710901	3731673	DT	Group of bone fragments spread over ~ 1 M² area w/ a few as far as 10 M away.	5				
				Bone not mineralized but pitted and easily flaked					
BDCMR014	706960	3731603	DT	Thigh bone, intact, not flaking easily. ~ 5 cm long.	5				
BLSMR001	706654	3731572	LS	Perched on paloverde ~ 100 M E of main N/S access road.					
BHMRB011	710649	3731262	HM	5 plants in shallow braided wash w/ scattered creosote bush, boursage					
BMARB002	712186	3731081		12 in x 12 in burrow entrance. Curves left after ~ 1 M. One small piece of coyote scat outside entrance. Likely coyote burrow. Burrow under creosote bush	5	✓	✓	✓	✓
BDBMR009	713995	3730036	DT	Series of burrows (3 + 1 small entrance) in cobble stream bank; All w/in 5 M of road.	2	✓			

***See Reverse and Complete Data Sheet for Desert Tortoises for ALL LIVE TORTOISES!!!**

****Coordinate Grid, UTM 11N, NAD 83**

Northern harrier
Loggerhead shrike
Western whiptail lizard
Zebratail lizard
Turkey vulture
phainopepla
Say's phoebe
northern mockingbird
western kingbird
ladderback woodpecker
desert iguana

DESERT TORTOISE FIELD SURVEY DATA SHEET - FOCUSED SURVEY

Site: Blythe: 3/4 and 1.0 mile Buffer, N.W. Corner. Date: 08 April, 2010 Page 1 of 2

Easting Start	Easting End	Map #	Survey-or	GPS (Data)	Additional Surveyors and GPS Units
N/W Buffer (3/4 & 1.0 mile) of Blythe Site: Completed to Main N&S Access Rd on west end.					BH: Sm-A RK: Sm-C

	Time	Temp (°F) Air/ground	Wind Sp/Dir (m.p.h.)	Weather & % Cloud
Start	0935	66.4/69.8	1.5-2.1/S.E.	0% C.C.
Mid-day	1335	83.0/90.5	1.2-13.6/N.	0% C.C.
End	1615	89.9/100.4	Ø-Ø/N.A.	0% C.C.

GPS Ident Code	GPS Easting**	GPS Northing**	Species	Comments	CLASS (1-5)	Burrow Suitable for (√=Yes): DT?	Wbo ?	Kfox ?	Badg ?
BLSBH008	705937	3731588	LS	1 bird. Perched on a Palo Verde tree.					
BMABH014	705021	3731570	MA	7in W x 7in H x unknown depth Inactive. Origin unknown.		✓	✓		
BDBRK003	702154	3730081	DB	16 in W x 10 in H x 24 in deep Inactive. Flat gravel bottom.	5	✓			
				Impossible to say what made this burrow and has used it. Possibly tortoise, it is suitable					
BDBRK003 4	702154	3730049	DB	20" W x 12 in" H x 30 in D. Rock Shelter. Same characteristics as BDBRK003	5	✓			
BDBBH010	702558	3729135	DB	14" W x 11" in H. x 40 in Deep. Same as BDBRK003.	5	✓			
BDBBH011	702549	3729553	DB	14 in W x 10 in H x 24 in Deep. Rock Shelter. Inactive. Suitable for tortoise.	5	✓			
BDBBH012	702543	3729753	DB	20" W x 10 in H x 36 in D. Flat-bottom Rock Shelter. Suitable for tortoise	5	✓			
BDBBH013	702545	3729756	DB	11 in W x 10 in H x 40 in Deep. Flat bottom Rock Shelter. Suitable for tortoise	5	✓			
BDBBH014	704004	3731148	DB.	24 in W x 8 in H x 25 in Deep. Caliche burrow. Inactive. Wide with flat bottom. Suitable for tortoise.	5	✓			

*See Reverse and Complete Data Sheet for Desert Tortoises for ALL LIVE TORTOISES!!!

**Coordinate Grid, UTM 11N, NAD 83

Cactus Wren, Gambel's Quail, Black-throated Sparrow, Northern Mockingbird, Brewer's Sparrow, White-crowned Sparrow, Rock Wren, Turkey Vulture, American Kestral, House Finch, Western Whiptail, Great Basin Collard Lizard, Side-blotched Lizard, Chuckwalla, Desert Iguana, Zebra-tailed lizard

DESERT TORTOISE FIELD SURVEY DATA SHEET - FOCUSED SURVEY

Site: Blythe (Buffer) Date: 08 April, 2010 Page 2 of 2

Easting Start	Easting End	Map #	Survey-or	GPS (Data)	Additional Surveyors and GPS Units	

	Time	Temp	Wind Sp/Dir	Weather & % Cloud
Start				
Mid-day				
End				

GPS Ident Code	GPS Easting**	GPS Northing**	Species	Comments	CLASS (1-5)	Burrow Suitable for (√=Yes): DT?	Wbo ?	Kfox ?	Badg ?
BDBB4015	704041	3731133	DB	Caliche' burrow with flat bottom and tortoise carapace-shaped roof.	2	✓			
				15 in W x 11 in H x unknown depth. In a wash bank. Disturbed soil shows signs of activity but gravel bottom.					
				Does not show tracks so use is uncertain.					
BMARK006	705862	3731189	MA	11 in W x 8 in H x unknown depth. Not active. Origins unknown.		✓	✓	✓	✓

*See Reverse and Complete Data Sheet for Desert Tortoises for ALL LIVE TORTOISES!!!

**Coordinate Grid, UTM 11N, NAD 83

3724900	BH	3724930	CG	3724960	BH	3724990	CG	3725020	BH	3725080 (050)	CG	3725080	BH	3725110	CG
905	CG	935	BH	965	CG	995	BH	025 ~~070~~	CG	055 090	BH	085	CG	115	BH
910	CG	940	BH	970	CG	3725000	BH	030 ~~075~~	CG	060 100	BH	090	CG	120	BH
915	BH	945	CG	975	BH	3725005	CG	035 ~~050~~	BH	065 ~~70~~	CG	095	BH	125	CG
920	BH	950	CG	980	BH	010	CG	040 ~~060~~	BH	070	CG	100	BH	130	CG
925	CG	955	BH	985	CG	015	BH	045 ~~070~~	CG	095	BH	105	CG	135	BH

DESERT TORTOISE FIELD SURVEY DATA SHEET - FOCUSED SURVEY

Site: Blythe: Cross-Check Survey Date: 10 April, 2010 Page 1 of 2

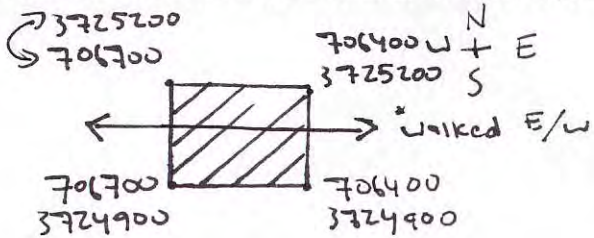
Easting Start	Easting End	Map #	Survey-or	GPS (Data)	Additional Surveyors and GPS Units
SEE Map Below					CG: SMA
					BH: SM CG

	Time	Temp (°F)	Wind Sp/Dir (mph)	Weather & % Cloud
Start	0945	73.0/71.6	4.0-5.9/SE	80% High Clouds
Mid-day	13:15	87/95	6.1-9.0/SE	40% High Clouds
End	1630	92.3/93.2	5.6-11.2/SW	40% High Clouds

GPS Ident Code	GPS Easting**	GPS Northing**	Species	Comments ("X" denotes a waypoint collected during Cross-Check Surveys)	CLASS (1-5)	Burrow Suitable for (√=Yes): DT?	Wbo ?	Kfox ?	Badg ?
BXKBBH001	706519	3724920	KB	~~BXKB~~ 4 openings and 1 partly collapsed entrance. 7in W x 8in H x unknown depth.		✓	✓	✓	
				All entrances are currently inactive.					
BXDOCG001	706524	3724919	DO	3 pieces of ~~of~~ tortoise egg shell fragments. Average size: 2mm x 2mm.					
				Shell fragments on spoil pile of Kit fox natal complex: BXKBBH001. photos on C.G. Camera.					
				Shell fragments typical for tortoise: thin and translucent, lacking external pock marks found on avian eggs.					
BXMACG001	0706637	3724973		w/ FRESH KF SCAT - NICE 24in x 24in EXCAVATION FLAT BOTTOM x 6 windows	✓	✗	✗	✗	
BXKBBH002	706430	3725037		Active Kit fox burrow. 11in W x 12in H x End unknown. ~~no trace of approx~~	✓	✓	✓	✓	

*See Reverse and Complete Data Sheet for Desert Tortoises for ALL LIVE TORTOISES!!!
**Coordinate Grid, UTM 11N, NAD 83

SE corner: 706400 (~~704600~~) 3724900



Gambel's Quail
House finch

Western whiptail
Side-blotched lizard
Western Diamondback
Say's Phoebe
Brewer's sparrow
Ash-throated flycatcher

3775140	BH	3775170	CG	3775200	BH												
145	CG	175	BH														
150	CG	180	BH														
155	BH	185	CG														
160	BH	190	CG														
165	CG	195	BH														

DESERT TORTOISE FIELD SURVEY DATA SHEET - FOCUSED SURVEY

Site: Blythe: Cross-Check Survey

Date: 10 April, 2010

Easting Start	Easting End	Map #	Survey-or	GPS (Data)	Additional Surveyors and GPS Units	

	Time	Temp	Wind Sp/Dir	Weather & % Cloud
Start				
Mid-day				
End				

GPS Ident Code	GPS Easting**	GPS Northing**	Species	Comments	CLASS (1-5)	Burrow Suitable for (√=Yes): DT?	Wbo ?	Kfox ?	Badg ?
				*South East corner of Cross-Check Survey Area was randomly chosen. First, the ~~est~~ easting was chosen using the Serial number on paper money (last 2 digits to decide easting on the 1,000 meter point). The same method was used to determine the northing.					

*See Reverse and Complete Data Sheet for Desert Tortoises for ALL LIVE TORTOISES!!!

**Coordinate Grid, UTM 11N, NAD 83

DESERT TORTOISE FIELD SURVEY DATA SHEET - FOCUSED SURVEY

Site: Blythe T Line S of I-10 Date: 4/12/2010 Page 1 of 2

Easting Start	Easting End	Map #	Survey-or	GPS (Data)	Additional Surveyors and GPS Units	
			DT	GTF4	MR SME	CG SMA
					RB SMI	BH SM16

	Time	Temp	Wind Sp/Dir	Weather & % Cloud
Start	7:55AM	67°F	3-6 mph E	Clear, 5%
Mid-day	12:05PM	74°F	3-5 mph E	Light rain, 99%
End	4:00 PM	77°F	9.2-17.2 SW	Clear, 15%

GPS Ident Code	GPS Easting**	GPS Northing**	Species	Comments	CLASS (1-5)	Burrow Suitable for (√=Yes): DT?	Wbo ?	Kfox ?	Badg ?
BMACG006	708528	3719464	MA	8x6 in., end not seen. In dense saharan mustard.		√		√	
BOOMR003	708264	3719028	Pool	Hard pan bottomed depression, ~~is~~ some evidence of ponding, ~10x5m., potential for spadefoot.					
BSHCG001	708245	3718950	Swainson's hawk	1 individual, soaring, moving West.					
BMFDT017	707354	3718853	MF	1 subadult					
BMFDT018	706897	3718845	MF	1 subadult					
BMFCG020	703723	3718764	MF	1 subadult					
BMFMR008	703160	3718677	MF	1 adult					
BMF~~MR~~CG021	703419	3718706	MF	1 subadult					
BMF~~MR~~CG022	703721	3718705	MF	1 adult					
BMFDT019	704035	3718709	MF	1 subadult					

*See Reverse and Complete Data Sheet for Desert Tortoises for ALL LIVE TORTOISES!!!
**Coordinate Grid, UTM 11N, NAD 83

Site: Blythe T Line S of I-10 **DESERT TORTOISE FIELD SURVEY DATA SHEET - FOCUSED SURVEY** Date: 4/12/2010

Easting Start	Easting End	Map #	Survey-or	GPS (Data)	Additional Surveyors and GPS Units	

	Time	Temp	Wind Sp/Dir	Weather & % Cloud
Start				
Mid-day				
End				

GPS Ident Code	GPS Easting**	GPS Northing**	Species	Comments	CLASS (1-5)	Burrow Suitable for (√=Yes): DT?	Wbo ?	Kfox ?	Badg ?
BMFDT020	704071	3718708	MF	1 subadult					
BMFCG023	704844	3718745	MF	1 subadult					
BMFMR009	704899	3718723	MF	1 adult					
BMFMR010	704955	3718721	MF	1 subadult					
BMFDT021	704989	3718733	MF	1 adult					
BMFCG024	705022	3718745	MF	1 subadult					
BMFCG025	707620	3718723	MF	1 adult					
BDCCG004	708567	3719626	DT	Mineralized bone fragment, 3/4 x 1/2 inch. Growth ~~marks~~ lines visible.	5				

*See Reverse and Complete Data Sheet for Desert Tortoises for ALL LIVE TORTOISES!!!
**Coordinate Grid, UTM 11N, NAD 83

DESERT TORTOISE FIELD SURVEY DATA SHEET - FOCUSED SURVEY

Site: Blythe: "T" line from 350M South of I-10, toward Substation. Date: 12 April, 2010 Page 1 of 2

Easting Start	Easting End	Map #	Survey-or	GPS (Data)	Additional Surveyors and GPS Units
					BH: Sm-16
					RB: Sm-I

	Time	Air/ground Temp (°F)	Wind Sp/Dir (MPH)	Weather & % Cloud
Start	0850	65.4/63.5	3.0-5.4/E	4.0 % scattered
Mid-day	1600	77.0/82.4	9.2-17.2/S.W.	15% scattered
End	Mid-Day Temp/weather on Other Data Sheet			

* light Rain this morning (1045) < .10 inch.

GPS Ident Code	GPS Easting**	GPS Northing**	Species	Comments	CLASS (1-5)	Burrow Suitable for (√=Yes): DT?	Wbo ?	Kfox ?	Badg ?
BMFRB001	707121	3718831	MF	1 sub-adult, ran into burrow					
BSWBH003	705900	3718793	SW	~40 individuals perched in creosote, took flight when we approached, soared overhead, + 50 birds * SEE Notes below					
BMFRB002	704437	3718769	MF	1 sub-adult, took shelter under creosote bush					
BLSBH009	703921	3718748	LS	1 bird perched & calling from a creosote bush					
				* Swainson's Notes: Birds perched on ground and in creosote. Looks like they were feeding on Sphinx moth larvae that were numerous in this area.					
BMFBH012	704877	3718757		1 adult					
BMFRB003	705108	3718757		1 sub-adult					

*See Reverse and Complete Data Sheet for Desert Tortoises for ALL LIVE TORTOISES!!!

**Coordinate Grid, UTM 11N, NAD 83

Northern Mockingbird
American Kestrel
Cactus Wren
Barn Swallow
Gambel's Quail
Swainson's Hawk
Brewer's Sparrow
Violet-green Swallow
Tree Swallow
Lesser Nighthawk
Yellow-rumped Warbler
Turkey Vulture
Northern Harrier
Red-tailed Hawk

Desert Iguana
Mojave fringe-toed lizard
Western Whiptail

DESERT TORTOISE FIELD SURVEY DATA SHEET - FOCUSED SURVEY

Site: Blythe: T Line Survey. South of I-10. Date: 12 April, 2010

Easting Start	Easting End	Map #	Survey-or	GPS (Data)	Additional Surveyors and GPS Units	

	Time	Temp	Wind Sp/Dir	Weather & % Cloud
Start				
Mid-day				
End				

GPS Ident Code	GPS Easting**	GPS Northing**	Species	Comments	CLASS (1-5)	Burrow Suitable for (√=Yes): DT?	Wbo ?	Kfox ?	Badg ?
BNHSH001	705140	3718759	NH	1 Northern Harrier soaring in migration w/a mixed flock of Turkey vultures, Red-tailed Hawk, and Swainson's Hawks (2).					
BMFRB004	707145	3718803	MF	1 sub-adult					
BMFRB005	707996	3718724	MF	1 sub-adult					
BMFBH014	708550	3719489	MF	1 adult					
BMFRB006	708555	3719541	MF	2 adults, 1 sub-adult + 2 ~10 m N ↳ adults					
BHMBH007 BM	708543	3719688	HM	3 plants					
BHMRB012	708553	3719714	HM	7 plants					

*See Reverse and Complete Data Sheet for Desert Tortoises for ALL LIVE TORTOISES!!!

**Coordinate Grid, UTM 11N, NAD 83

KF	0708415															
MP	0708385															
			Burrowing Owl Buffer													

STOP @ 380'

DESERT TORTOISE FIELD SURVEY DATA SHEET - FOCUSED SURVEY

Site: Blythe

Date: April 13, 2010

Easting Start	Easting End	Map #	Surveyor	GPS (Data)	Additional Surveyors and GPS Units	
0708415		[illegible]	Kim Fuller	SM A	Mike Rathman	SM I
					Kim Fuller	SM A

	Time	Temp	Wind Sp/Dir	Weather & % Cloud
Start	7:30 AM	61°F	1.0 mph/E	clear
Mid-day	10:45 AM	76.7°F	0.9 mph/E	clear
End	2:30 PM	81.4°F	1.8 mph/SW	clear

GPS Ident Code	GPS Easting**	GPS Northing**	Species	Comments	CLASS (1-5)	Burrow Suitable for (√=Yes): DT?	Wbo ?	Kfox ?	Badg ?
BKBKF001	0708467	3719783	kit fox	2 openings, fresh tracks but no other sign 10" wide x 8" tall, 6" wide x 9" tall				✓	
BSWMR003	0708059	3718842	swainson's hawk	a pair circling overhead					
BMFMR011	0708000	3718874	fringed toe	sub-adult?					
BHMMR010	0708550	3720423	mule veteb	6 plants north of power line road in small wash					
BDCMR015	0708601	3720141	DT bone	a piece of desert tortoise bone (shell fragment) 1" x 3/4"	(3) 5				
BMAKF001	0708621	3719730	normal burrow	1 opening just active 5" wide x 6" tall		✓	✓	✓	
BMAKF002	0708499	3719141	normal burrow	1 opening in berm 7" wide x 7½" tall, goes in 4' & turns to right		✓	✓	✓	✓
BMFKF001	0707957	3718628	fringed toe lizard	adult					
BMFMR012	0707411	3718735	fringed toe lizard	adult in sand hummocks					
BMAMR012	0708714	3719423	normal burrow	under a creosote shrub 7" wide x 7" tall		✓	✓	✓	

*See Reverse and Complete Data Sheet for Desert Tortoises for ALL LIVE TORTOISES!!!

**Coordinate Grid, UTM 11N, NAD 83

wechurling
swainson's hawk "
desert iguana
whiptail
fringed toe

side-blotched leopard lizard
white crowned sparrow
western kingbird
turkey vulture
yellow rumped warbler

zebra tailed lizard

DESERT TORTOISE FIELD SURVEY DATA SHEET - FOCUSED SURVEY

Site: Blythe Date: April 13, 2010 Page 2 of 2

Easting Start	Easting End	Map #	Survey-or	GPS (Data)	Additional Surveyors and GPS Units	

	Time	Temp	Wind Sp/Dir	Weather & % Cloud
Start				
Mid-day				
End				

GPS Ident Code	GPS Easting**	GPS Northing**	Species	Comments	CLASS (1-5)	Burrow Suitable for (√=Yes):			
						DT?	Wbo ?	Kfox ?	Badg ?
BHMKF001	0708679	3719606	creosote	~10 plants + ~6 plants 30m east in a slight depression					

*See Reverse and Complete Data Sheet for Desert Tortoises for ALL LIVE TORTOISES!!!
**Coordinate Grid, UTM 11N, NAD 83

Site: Palen

DESERT TORTOISE FIELD SURVEY DATA SHEET [redacted] ~~Habitat Assessment~~

Date: 3/12/10

WBO 500' Buffer

Easting Start	Easting End	Map #	Survey-or	GPS (Data)	Additional Surveyors and GPS Units	
			SDA	GTF4	ADA-15	EGR-PC11
					GLU-11	

	Time	Temp	Wind Sp/Dir	Weather & % Cloud
Start	9:54AM	60°F	1 to 4 mph	0% CC
Mid-day				
End				

GPS Ident Code	GPS Easting**	GPS Northing**	Species	Comments	CLASS (1-5)	Burrow Suitable for (√=Yes): DT?	Wbo ?	Kfox ?	Badg ?
PKBSD001	0668296	3727774	kitfox	kitfox burrow (one), recent diggings		✓	✓	✓	X
PKBGL001	0668283	3727860	kitfox	kitfox burrow complex (3) white wash & WBO pellet, partially collapsed w/ recent rains		✓	1✓	✓	X
PMFAD002	0668226	3728540	MFTL	subadult Mojave fringe-toed lizard		~~✓~~	~~2~~	~~✓~~	~~X~~
PMFGL001	0668983	3728827	MFTL	adult Mojave fringe-toed lizard					
PMFSD002	0668994	3728793	MFTL	subadult Mojave fringe-toed lizard					
PMFGL002	0669114	3728828	MFTL	adult MFTL					
SM " PMFGL003	0669681	3728825	MFTL	subadult MFTL					
SM " PMFGL004	0669723	3728819	MFTL	subadult MFTL					
PNHAD001	0670040	3728788	northern harrier	migrant northern harrier, female					
PMFSD003	0670028	3728386	MFTL	subadult MFTL					

*See Reverse and Complete Data Sheet for Desert Tortoises for ALL LIVE TORTOISES!!!

**Coordinate Grid, UTM 11N, NAD 83

Reservation # 06284992US0

- Zebratail, sidblotch, coyote, ~~cow~~ raven
- Some galleta grass associations in drainages

Site: PALEN

DESERT TORTOISE FIELD SURVEY DATA SHEET [redacted] ~~Habitat Assessment~~

Date: 3/12/10

WBS 500'

Page 2 of 6

Easting Start	Easting End	Map #	Survey-or	GPS (Data)	Additional Surveyors and GPS Units	
			SDA	GTF4		

	Time	Temp	Wind Sp/Dir	Weather & % Cloud
Start				
Mid-day	1:05PM	76°F	0mph	0% CC
End				

GPS Ident Code	GPS Easting**	GPS Northing**	Species	Comments	CLASS (1-5)	Burrow Suitable for (√=Yes): DT?	Wbo ?	Kfox ?	Badg ?
PMFGL005	0670067	3728366	MFTL	subadult MFTL					
PMFGL006	0670061	3728194	MFTL	adult MFTL					
PMFSD004	0670033	3728191	MFTL	one adult and one subadult MFTL w/i 10m of each other					
PMFGL007	0670057	3728055	MFTL	subadult MFTL					
PDCGL001	0670059	3727923	DT	Small piece of mineralized tortoise bone, 1/4" x 1/4" juvenile marginal	5				
PDCSD001	0670041	3727553	DT	Small piece, mineralized tortoise bone 1/2" x 1/4"					

*See Reverse and Complete Data Sheet for Desert Tortoises for ALL LIVE TORTOISES!!!

**Coordinate Grid, UTM 11N, NAD 83

duplicate of page 2 this date!

WBO 500' Buffer [Rewrite]

DESERT TORTOISE FIELD SURVEY DATA SHEET - ~~FOCUSED SURVEY~~

Site: Palen

Date: 3/12/10

Page 23 of 6

(REWRITTEN – original datasheet used reverse page)

Easting Start	Easting End	Map #	Survey-or	GPS (Data)	Additional Surveyors and GPS Units	
				SM15	SDA	GLU
				GTF4	EGR	ADA

	Time	Temp	Wind Sp/Dir	Weather & % Cloud
Start		60°F	2-4mph	0% CC
Mid-day				
End				

1= WBO sign, 2=high

GPS Ident Code	GPS Easting**	GPS Northing**	Species	Comments	CLASS (1-5)	Burrow Suitable for (√=Yes): DT?	Wbo ?	Kfox ?	Badg ?
PMAAD001	0668228	3727221	mammal	7"x5" burrow in concentration - others not as suitable		✓	2✓		
PMAAD002	0668231	3728667	mammal	8"x10"		✓	2✓	✓	
PMFAD002	0668288	3728894	MFTL	subadult - low accretion dune area					
PMFAD003	0668314	3728886	MFTL	subadult - " "					
PMFAD004	0668508	3728873	MFTL	subadult "					
PMFAD005	0668557	3728871	MFTL	"					
PMFAD006	0668578	3728867	MFTL	Adult					
PMFAD007	0668929	3728869	MFTL	SA " "					
PMFAD008	0669025	3728863	MFTL	SA " "					
PMFEG001	0669153	3728877	MFTL	SA					

*See Reverse and Complete Data Sheet for Desert Tortoises for ALL LIVE TORTOISES!!!

**Coordinate Grid, UTM 11N, NAD 83

duplicate of Page 2 & 6 thru date - Part II

Site: Palen

DESERT TORTOISE FIELD SURVEY DATA SHEET - FOCUSED SURVEY

Date: 3/12/10 [Rewrite of Page 6] Page 3 4 of 6

Easting Start	Easting End	Map #	Survey-or	GPS (Data)	Additional Surveyors and GPS Units	

	Time	Temp	Wind Sp/Dir	Weather & % Cloud
Start				
Mid-day				
End				

GPS Ident Code	GPS Easting**	GPS Northing**	Species	Comments	CLASS (1-5)	Burrow Suitable for (√=Yes): DT?	Wbo ?	Kfox ?	Badg ?
PMFAD009	0669121	3728847	MFTL	subadult					
PMFAD010	0669344	3728851	MFTL	subadult					
PMFAD011	0669585	3728885	MFTL	subadult					
PMFEG002	0669837	3728914	MFTL	adult					
PMFAD012	0670087	3728768	MFTL	subadult					
PMFAD013	0670119	3728714	MFTL	adult					
PMFAD014	0670088	3728409	MFTL	adult					
PMFAD015	0670101	3728194	MFTL	subadult					
PMFAD016	0670116	3728016	MFTL	subadult					
PMFAD017	0 7	3	MFTL	subadult (ink illegible for easting / northing)					

*See Reverse and Complete Data Sheet for Desert Tortoises for ALL LIVE TORTOISES!!!

**Coordinate Grid, UTM 11N, NAD 83

-Small accretion dunes & sandy flats

duplicate of Page #6 this date

Site: Palen

DESERT TORTOISE FIELD SURVEY DATA SHEET - FOCUSED SURVEY

Date: 3/12/10

Page #5 of 6

[Rewrite of Page 6]

Easting Start	Easting End	Map #	Survey-or	GPS (Data)	Additional Surveyors and GPS Units	

	Time	Temp	Wind Sp/Dir	Weather & % Cloud
Start				
Mid-day				
End				

GPS Ident Code	GPS Easting**	GPS Northing**	Species	Comments	CLASS (1-5)	Burrow Suitable for (√=Yes): DT?	Wbo ?	Kfox ?	Badg ?
PKBEG001	0670180	3727066	kitfox	kit fox complex with evidence of badger digging, 3 large burrows,		✓	✓(2)	✓	✓
PMAEG005	0670166	3727034		large burrow in ground squirrel complex, 6x6, ~~[illegible]~~		✓	✓(2)		
PMFAD018	0670124	3727543	MFTL	subadult					
PKBEG002	0669758	3726937	kitfox	2 large kit fox burrows		✓	✓	✓	✓

*See Reverse and Complete Data Sheet for Desert Tortoises for ALL LIVE TORTOISES!!!

**Coordinate Grid, UTM 11N, NAD 83

Rewritten - See pages 3,4

Page 6 of 6

Site: Palen

DESERT TORTOISE FIELD SURVEY DATA SHEET [redacted] ~~Habitat Assessment~~ WBO 500' Buffer

Date: 3/12/10

Page ~~2~~ of Rewritten

[This datasheet was rewritten (3/12/10, ~~Page 2~~ Rewrite]

Easting Start	Easting End	Map #	Survey-or	GPS (Data)	Additional Surveyors and GPS Units	

	Time	Temp	Wind Sp/Dir	Weather & % Cloud
Start		60°F	1-4 mph	0%
Mid-day				
End				

GPS Ident Code	GPS Easting**	GPS Northing**	Species	Comments	CLASS (1-5)	Burrow Suitable for (√=Yes): DT?	Wbo ?	Kfox ?	Badg ?
GPS GSM-15 PMAAD001	0668228	3727221		7x5 burrow in concentration - others not as suitable		✓	2✓		
GPS F4 PMAAD002	0668231	3728667		8x10		✓	2✓	✓	
GSM15 PMFAD002	0668288	3728894	MFTL	Subadult - Low accretion hume area					
PMFAD003	0668314	3728886	MFTL	Subadult - " "					
PMFAD004	0668508	3728873	MFTL	Sub - " "					
PMFAD005	0668557	3728871	MFTL	" "					
PMFAD006	0668578	3728867	MFTL	ADULT " "					
PMFAD007	0668929	3728869	MFTL	SA					
PMFAD008	0669025	3728863	MFTL	SA " "					
PMFEG001	0669153	3728877	MFTL	SA					

*See Reverse and Complete Data Sheet for Desert Tortoises for ALL LIVE TORTOISES!!!

**Coordinate Grid, UTM 11N, NAD 83

PMFAD009	0669121	3728847	MFTL	Sub Adult	PMFAD013	0670119 3728714	MFTL Ad
PMFAD010	0669344	3728851	MFTL	Sub Ad.	PMFAD014	0670088 3728469	MFTL Ad
PMFAD011	0669585	3728885	MFTL	SA	PMFAD015	0670101 3728194	MFTL SA
PMFEG002	0669837	3728914	MFTL	Adult	PMFAD016	0670116 [illegible]	MFTL SA
PMFAD012	0670087	3728768	MFTL	SA	PMFAD017	[illegible]	MFTL SA

Sm. Acc. dunes Sandy flats

PKBEG001	0670180 3727066	KB complex with evidence of badger digging. 3 Large burrows Suit for DT, Burrow 2, KF, Badger
PMAEG005	0670166 3727034	Large burrow in GS complex - 6x6 - Suit. for DT Burrow 2
PMFAD013	0670124 3727543	MFTL SA
PKBEG002	0669758 3726937	2 Large KB Suit for DT Burrow 2 KF Badger

[redacted]TION INDEX FOR DESERT TORTOISE SIGN
Burrows and Dens, Scats, and Shell Remains

(1) Burrows and Dens:
1. currently active, with tortoise or recent tortoise sign
2. good condition, definitely tortoise; no evidence of recent use
3. deteriorated condition (please describe); definitely tortoise
4. deteriorated condition; possibly tortoise (please describe)
5. good condition; possibly tortoise (please describe)

(2) Scats:
1. wet (not from rain or dew) or freshly dried; obvious odor
2. dried with glaze; some odor; dark brown
3. dried; no glaze or odor; signs of bleaching (light brown), tightly packed material
4. dried; light light brown to pale yellow, loose material; scaly appearance
5. bleached, or consisting only of plant fiber

(3) Shell Remains:
1. fresh or putrid
2. normal color; scutes adhere to bone
3. scutes peeling off bone
4. shell bone is falling apart; growth rings on scutes are peeling
5. disarticulated and scattered

GPS and Field Note Nomenclature**

Eg. PDLSD001

P=Site Identifier, DL=live desert tortoise, SD=surveyor identifier (SD=Shelly Dayman), 001=observation #

Site Identifier Blythe=B Palen=P Ridgecrest=R

Species Identification Codes

Herps and Desert Tortoise	BB=burrow	**Bird Species (continued)**	**Mammals**
DL=desert tortoise live	BF=feather	NH=northern harrier, NN=nest	KB=kit fox burrow
DB=burrow	BP=pellets	BT=Bendire's thrasher, BN=nest	GL=American badger live
DS=scat	BO=other (describe)	CT=Crissal's thrasher, CN=nest	GB=American badger burrow
DC=carcass	**Bird Species**	GF=Gilded flicker, GN=nest	ML=Mojave ground squirrel live
DT=tracks	WK=White-tailed kite, KN=nest	GW=Gila Woodpecker, WN=nest	SL=big horn sheep live
DP=desert tortoise pallet	CO=Cooper's hawk, ON=nest	PR=prairie falcon, RN=nest	SC=big horn sheep carcass
DO=other (describe)	SW=Swainson's hawk, SN=nest	PE=peregrine falcon, PN=nest	SS=big horn sheep scat
Other Herps	FE=Ferruginous hawk, FN=nest	NE=unknown bird nest	BA=bat roosting sites
MF=Mojave fringe-toed lizard	GE=golden eagle, EN=nest		OO=other, specify in notes
Birds and Burrowing Owl	LS=loggerhead shrike, LN=nest		MA=mammal burrow
BL=burrowing owl live	LT=Le Conte's thrasher, HN=nest		BC=barrel cactus

Comments Needed***

1. **Burrows and Dens** -Type (burrow, pallet), location (under bush etc.), width, length, depth, other sign present
2. **Scats** – number and estimated size of scat
3. **Shell Remains** – record MCL (carapace length at midline) and PLN (plastron length), note any chips or shell anomalies
4. **Live Tortoises** – Complete Data Sheet for Live Tortoises and Health Profile Form for Desert Tortoises for ALL LIVE TORTOISES

DESERT TORTOISE FIELD SURVEY DATA SHEET ~~-FOCUSED SURVEY~~ ~~WBO 500' Buffer~~ WBO 500' Buffer

Site: Blythe Date: 3/14/10 Page 1 of 1

Part I 3/14/10

Easting Start	Easting End	Map #	Survey-or	GPS (Data)	Additional Surveyors and GPS Units	
-			SDA		GLU	DTG
					BHA	EGR

	Time	Temp	Wind Sp/Dir	Weather & % Cloud
Start	10:41 AM	64°F	5 to 13 mph	0% cl
Mid-day				
End				

GPS Ident Code	GPS Easting**	GPS Northing**	Species	Comments	CLASS (1-5)	Burrow Suitable for (√=Yes): DT?	Wbo ?	Kfox ?	Badg ?
3DSSD001	0704452	3726212	DT	DT scat, bleached, loose 2½" x 3/4"	4				
BDLBH001	0704484	3726285	DT	tortoise, live, adult, in burrow 315 mm MCL @ entrance to burrow, resting		✓			
				like BDLGH001 from last year					
-									

*See Reverse and Complete Data Sheet for Desert Tortoises for ALL LIVE TORTOISES!!!
**Coordinate Grid, UTM 11N, NAD 83

Costa's hummingbird

Do not abbreviate

Health Profile Form for Desert Tortoises

Write on this side only

Located by B Hart
Processed by S. Dayman
Study site name Blythe

Township ..... Range .....
Section ..... Quadrat .....

Coordinates (Reference SW corner)
..... meters North ..... meters East

UTM's 0704454 n 3726285 e

County Riverside State CA

O On Plot O Off Plot

Show location of tortoise in quadrat

Tortoise ID # BDLBH001
Year first marked .....
Verification of ID ☐
Capture type ..... Sex M
Date (dd/mm/yy) 3/14/10
Time (PST): Start 11:20AM End 11:25AM
Shell wear class .....
Process time ..... hours
Frequency .....
Transmitter # .....

BEAK & NARES

Beak/nares wet	O Yes	O No	O Unk
Beak/nose damp	O Yes	O No	O Unk
Nasal exudate present	O Yes	O No	O Unk
Exudate color	☐ clear ☐ cloudy ☐ white ☐ yellow ☐ green		
Bubble(s) from nares	O Yes	O No	O Unk
One nare occluded	O Yes	O No	O Unk
Both nares occluded	O Yes	O No	O Unk
Dirt on nose/beak	O Yes	O No	O Unk
Dirt in nares	O Yes	O No	O Unk

FORELEGS (adjacent to face)

Dried dirt on forelegs	O Yes	O No	O Unk
Moisture on forelegs	O Yes	O No	O Unk
Dried exud. on scales	O Yes	O No	O Unk
Scales cracking	O Yes	O No	O Unk

BREATHING

Smooth	O Yes	O No	O Unk
Wheezing	O Yes	O No	O Unk
Rasping, clicking	O Yes	O No	O Unk

EYES, CHIN GLANDS Circle eyes or lids:

Eyes/lids whitened or discolored	O Yes	O No	O Unk
Eyelids swollen	O Yes	O No	O Unk
Eyes/lids wet	O Yes	O No	O Unk
Discharge from eyes	O Yes	O No	O Unk
Eyes sunken	O Yes	O No	O Unk
Eyes clear, bright	O Yes	O No	O Unk
Eyes dull, cloudy	O Yes	O No	O Unk
Chin glands draining	O Yes	O No	O Unk

INTEGUMENT

Integument dull	O Yes	O No	O Unk
Integument glossy	O Yes	O No	O Unk
Normal elasticity	O Yes	O No	O Unk
Abnormal skin peeling	O Yes	O No	O Unk

POSTURE/BEHAVIOR

Alert, responsive	O Yes	O No	O Unk
Lethargic	O Yes	O No	O Unk
Can withdraw tightly into shell	O Yes	O No	O Unk
Limbs, head hanging loose	O Yes	O No	O Unk

normal

ORAL CAVITY

Observed	O Yes	O No	O Unk
Discharge present	O Yes	O No	O Unk
Membranes pink	O Yes	O No	O Unk
Membranes pale, white	O Yes	O No	O Unk
Smells/mouth rot	O Yes	O No	O Unk

EVIDENCE OF SHELL DISEASE

Lesions present	O Yes	O No	O Unk
Lesions active	O Yes	O No	O Unk
Lesions healed	O Yes	O No	O Unk
Scute laminae peeling	O Yes	O No	O Unk
Scutes missing/peeling	O Yes	O No	O Unk
Pitting	O Yes	O No	O Unk
Scutes depressed/concave	O Yes	O No	O Unk
Fungal areas	O Yes	O No	O Unk

none noted

EVIDENCE OF TRAUMA

Head	O Yes	O No	O Unk
Gular	O Yes	O No	O Unk
Forelimbs	O Yes	O No	O Unk
Hindlimbs	O Yes	O No	O Unk
Shell	O Yes	O No	O Unk
Scute/bone replacement	O Yes	O No	O Unk

none noted

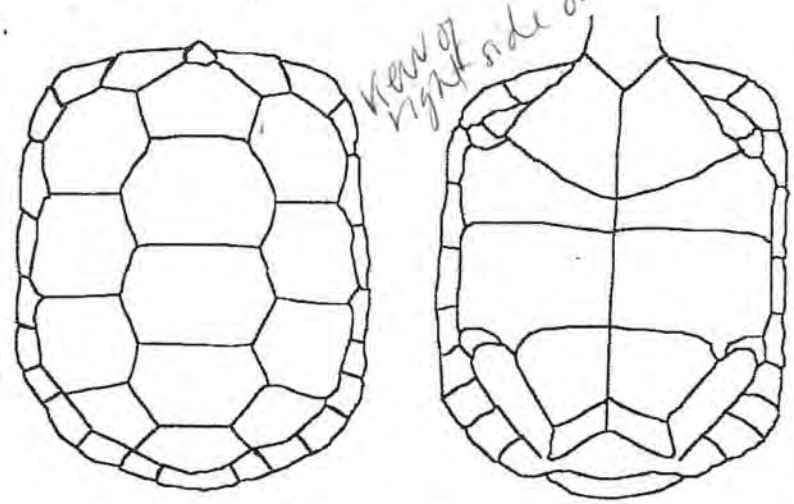
Describe: .....

Soil dryness: O wet O damp O dry

Last precipitation (dd/mm/yy) .....

Urine (vol) .....
Color .....
Viscosity .....
Particulates .....
Color .....
Nasal wash collected .....
Amt. blood/lymph taken (cc) .....
# of needle sticks .....
Time (min) of needle sticks .....
Location .....
PCV% .....
Other samples taken .....
Describe/draw parasites

DRAW: shape of gulars, location of notches; chips, chews, shell damage, lesions; shell disease; shell abnormalities; scute concavities. Make new drawing at least once per year (spring).



Other notes .....

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Do not abbreviate

Data Sheet for Live Desert Tortoises

Write on this side only

Located by B Hart
Processed by S Dayman
Study site name Blythe

Township ..... Range .....
Section ..... Quadrat .....

Coordinates (Reference SW corner)
..... meters North ..... meters East

UTM's 0704484 n 3726285 e

Elevation ..... m Accuracy ± ..... m

County Riverside State CA

O On Plot O Off Plot

Show location of tortoise in quadrat

Tortoise ID # BDLBH 001
Year first marked .....
Verification of ID ☐
Capture type ..... Sex M
Date (dd/mm/yy) 3/14/10
Time (PST): Start 11:20AM End 11:25AM
Frequency ..... Transmitter # .....
Transmitter type .....
Transmitter attached .....
Transmitter to be replaced on .....
PIT # .....

Tortoise Location

Cover site type:
- ☒ burrow
- ☐ pallet
- ☐ shrub
- ☐ caliche cave
- ☐ rock shelter

At cover site:
- ☐ entering
- ☐ exiting
- ☐ on mound
- ☒ inside

Not at cover site:
- ☐ in open
- ☐ other

Burrow Data (pallet)

ID # .....
Orientation north
Length ..... Height .....
Width 330mm Soil cover caliche
Location area

Survey Type

- O Radio track
- O Burrow search
- O Coverage 1
- O Coverage 2
- O Incidental
- O Other

Tortoise Activity

- ☒ resting
- ☐ basking
- ☐ walking
- ☐ feeding
- ☐ Interacting with other tortoise
- ☐ Interacting with other animals

ID & sex of other tortoise .....
Species .....
Describe interaction:

Plants/items eaten (specific):

Color (shell & skin)

	HV	Hue	Value	Chroma	Color
V1 (center)					
V4 (center)					
LC1,2&V2 (seam)					
LM5,6 & LC2 (seam)					
Foreleg					
Hindleg					

Are you color blind? O Yes ☒ No
Type of blindness .....

Body Measurements

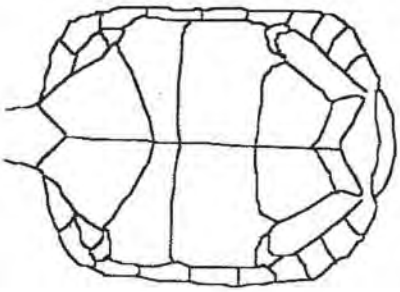
MCL (mm) 315 estimate
PLN (mm) _____
Weight (g) _____
Void (g) _____
Total wt (g) _____

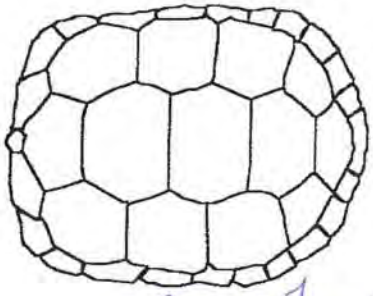
New growth
☐ present ☐ absent

Epoxy #
☐ present ☐ legible

Behavior

sitting just inside burrow





↑ view of right side only

Other notes

Photos; roll ..... frames .....

Draw locations of notches (old and new), chips, and anomalies, etc.
Describe anomalies in numbering of marginals and any identification problems.

Entered by ☐ date ☐ on computer ☐
Modified by ☐ on ☐

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703010	X	702830	X	702650	X	702470	X	7022290	X								
2980	X	2800	X	2620	X	2440	X										
2950	X	2770	X	2590	X	2410	X										
2920	X	2740	X	2560	X	2380	X										
2890	X	2710	X	2530	X	2350	X										
2860	X	2680	X	2500	X	2320	X										

Part II 3/14/10

~~DESERT TORTOISE~~ WBO FIELD SURVEY DATA SHEET - ~~FOCUSED SURVEY~~ ~~Habitat Assessment~~

Site: Blythe Substation WBO Date: 3/14/2010 Page 1 of 10

Burrowing owl burrow mapping - Blythe Substation

Easting Start	Easting End	Map #	Survey-or	GPS (Data)	Additional Surveyors and GPS Units	
703010			DT, GL	GTF4, SM 11	AD15	BH16
					EG11 PC	

	Time	Temp	Wind Sp/Dir	Weather & % Cloud
Start	1:15 PM	70° F	1-7 mph	windy, 0% cloud
Mid-day		)		
End	5:20 PM	73° F	5-10 mph	windy, 0% cloud

GPS Ident Code	GPS Easting**	GPS Northing**	Species	Comments	CLASS (1-5)	Burrow Suitable for (√=Yes): DT?	Wbo ?	Kfox ?	Badg ?
BMFBH001	702893	3718944	MF	1 Adult MF. Running across sand					
BMFBH002	702904	3718829	MF	1 Adult MF. Running across sand					
BMADT001	702920	3718638	MA	1 burrow, 5x5, good condition	5		✓		
BHMBH001	702891	3718641	Hm (milkvetch)	70 milkvetch plants. point in center of group	-incorrect	ID, not Harwood's			
BHMBH002	702864	3718583	Hm	6 plants	-incorrect	ID,	"		
BHMBH003	702857	3718621	HM	25 plants at this location	-incorrect	ID,	"		
BHMDT001	702833	3718645	HM	5 plants	-incorrect	ID,	"		
BHMBH004	702853	3718692	Hm	40 plants	-incorrect	ID,	"		
BHMDT002	702774	3719129	HM	15 plants in rocky soil patch	-incorrect	ID,	"		
BHMDT003	702623	3719074	HM	5 plants in rocky patch	-incorrect	ID,	"		

***See Reverse and Complete Data Sheet for Desert Tortoises for ALL LIVE TORTOISES!!!**
****Coordinate Grid, UTM 11N, NAD 83**

WBO

~~DESERT TORTOISE~~ FIELD SURVEY DATA SHEET - ~~FOCUSED SURVEY~~ Habitat Assessment

Site: Blythe Substation WBO Date: 3/14/2010 Page 2 of 10

Easting Start	Easting End	Map #	Survey-or	GPS (Data)	Additional Surveyors and GPS Units	

	Time	Temp	Wind Sp/Dir	Weather & % Cloud
Start				
Mid-day				
End				

GPS Ident Code	GPS Easting**	GPS Northing**	Species	Comments	CLASS (1-5)	Burrow Suitable for (√=Yes): DT?	Wbo ?	Kfox ?	Badg ?
BHmBH005	702593	3719045	Hm	15 plants along S. side of depression in dune.	- incorrect	ID, not Harwood's			
BHMDT004	702617	3718984	HM	2 plants in rocky patch in dunes	- "			"	
BmFmH003	702598	3718983	mF	1 Subadult					
~~Bm~~ Hm ~~BH~~ BH006	702599	3718975	Hm	3 plants in dune depression	- incorrect	ID, not Harwood's			
BHMDT005	702618	3718939	HM	10 plants at base of dune	- "				
BHmBH007	702590	3718867	Hm	27 plants in dune depression.	- "				
BHMDT006	702620	3718781	HM	10 plants in dune depression	- "				
BHMDT007	702617	3718714	HM	30 plants in dune depression	- "				
BHMDT008	702621	3718627	HM	20 plants in rocky soil patch	- "				
BHmBH008	702589	3718580	HM	5 plants at this local.	- "				

*See Reverse and Complete Data Sheet for Desert Tortoises for ALL LIVE TORTOISES!!!

**Coordinate Grid, UTM 11N, NAD 83

Site: Blythe WBO Substation

~~DESERT TORTOISE~~ WBO FIELD SURVEY DATA SHEET [redacted] ~~Habitat Assessment~~

Date: 3/14/10

Page 3 of 10

Easting Start	Easting End	Map #	Survey-or	GPS (Data)	Additional Surveyors and GPS Units	

	Time	Temp	Wind Sp/Dir	Weather & % Cloud
Start				
Mid-day				
End				

GPS Ident Code	GPS Easting**	GPS Northing**	Species	Comments	CLASS (1-5)	Burrow Suitable for (√=Yes): DT?	Wbo ?	Kfox ?	Badg ?
BHMBH009	702592	3718558	Hm	5 plants	- incorrect	ID, Not	Harwoods		
BHMDT009	702601	3718546	HM	Many plants, sparsely spaced in 10 m radius in rocky soil	"			"	
BHMBH010	702587	3718527	Hm	7 plants	- "			"	
BHMDT010	702530	3718534	HM	5 plant on North side of road	- "			"	
BHMBH011	702564	3718527	Hm	35 plants / split on both sides of Utility Rd.	- "			"	
BHMDT011	702542	3718561	Hm	15 plant spread over 10 m radius	- "			"	
BMFDT001	702537	3718599	MF	1 subadult, missing tail					
BHMBH012	702560	3718605	Hm	10 plant at this location	- incorrect	ID, not	Harwood's		
BHMBH013	702565	3718636	Hm	45 plants in a sandy depression	- "			"	
BHMDT012	702530	3718671	HM	6 plant in depression in dune	- "			"	

*See Reverse and Complete Data Sheet for Desert Tortoises for ALL LIVE TORTOISES!!!

**Coordinate Grid, UTM 11N, NAD 83

DESERT TORTOISE FIELD SURVEY DATA SHEET - FOCUSED SURVEY

Site: Blythe WBO Substation Date: 3/14/10 Page 4 of 10

Easting Start	Easting End	Map #	Survey-or	GPS (Data)	Additional Surveyors and GPS Units	

	Time	Temp	Wind Sp/Dir	Weather & % Cloud
Start				
Mid-day				
End				

GPS Ident Code	GPS Easting**	GPS Northing**	Species	Comments	CLASS (1-5)	Burrow Suitable for (√=Yes): DT?	Wbo ?	Kfox ?	Badg ?
BHMBH014	702560	3718672	Hm	20 plants	- incorrect ID, not Harwood's				
BHMBH015	702559	3718771	Hm	40 plants in a sandy depression	- "			"	
BHMBH016	~~702~~558	3718849	Hm	20 plants in a sandy depression	- "			"	
BHMBH017	702548	3718922	Hm	8 plants	- "			"	
BHMDT013	702528	3719036	HM	10 plants in depression in dunes	- "			"	
BHMDT014	702321	3719125	HM	3 plants in depression in dunes	- "			"	
BHMDT015	702322	3719054	HM	2 plants on side of dune	- "			"	
BHMBH018	702292	3718980	Hm	11 plants in a depression	- "			"	
BMABH001	702240	3718974	MA	Desert K-rat burrow on S. side of a dune mound. Marginal B. Owl.			✓		
BHMBH019	702288	3718811	Hm	25 plants in depression, west end	- incorrect ID, not Harwood's				

*See Reverse and Complete Data Sheet for Desert Tortoises for ALL LIVE TORTOISES!!!
**Coordinate Grid, UTM 11N, NAD 83

WBO Habitat Assessment

~~DESERT TORTOISE~~ FIELD SURVEY DATA SHEET - ~~FOCUSED SURVEY~~

Site: Blythe WBO Substation Date: 3/14/10 Page 5 of 10

Easting Start	Easting End	Map #	Survey-or	GPS (Data)	Additional Surveyors and GPS Units	
					EG 11	

	Time	Temp	Wind Sp/Dir	Weather & % Cloud
Start				
Mid-day				
End				

GPS Ident Code	GPS Easting**	GPS Northing**	Species	Comments	CLASS (1-5)	Burrow Suitable for (√=Yes): DT?	Wbo ?	Kfox ?	Badg ?
BHMBH020	702295	3718742	Hm	6 plants. N. end of shallow depression	- incorrect		ID, not Hamsots)		
BHM DT016	702316	3718594	HM	25 plants in depression in dunes	- "			"	
BHMBH021	702239	3718594	Hm	23 plants in a small depression	- "			"	
BHMBH022	702309	3718541	Hm	25 plants, spark on both sides of road	- "			"	
BBBADO01	703424	3719389	WBO	2 burrows, 6x5, 5x5, old whitewash, pellets, off site			✓		

*See Reverse and Complete Data Sheet for Desert Tortoises for ALL LIVE TORTOISES!!!

**Coordinate Grid, UTM 11N, NAD 83

Site: Blythe Substation WBO' DESERT TORTOISE FIELD SURVEY DATA SHEET - FOCUSED SURVEY Date: 3/19/10 Page ~~1~~ 6 of ~~4~~ 10

Easting Start	Easting End	Map #	Survey-or	GPS (Data)	Additional Surveyors and GPS Units	
			GLU	11	ADA	15

	Time	Temp	Wind Sp/Dir	Weather & % Cloud
Start				
Mid-day	1:10pm	71°F	1-7 mph	0% cc
End				

GPS Ident Code	GPS Easting**	GPS Northing**	Species	Comments	CLASS (1-5)	Burrow Suitable for (√=Yes): DT?	Wbo ?	Kfox ?	Badg ?
BMFAD001	0703575	3719375	MF	Mohave fringe toed sub adult					
BMFGL001	0703467	3719022	MF	Mohave fringe toed sub adult					
BHMAD001	0703387	3718998		~~Harbonsons~~ Milk vedge? vetch. Harwoodson's ~30+ plants. Need to look at it once it flowers	– incorrect ID, not Harwoods				
BMFAD002	0703055	3719084	MF	MFL adult					
BHMAD002	0702954	3718890		1 plant ~~Harbonsons~~ milk ~~vedge~~ vetch Harwoodson's	– incorrect ID, not Harwoods				
BHMAD003	0702952	3718727		~~Harbonsons~~ Milk ~~vedge~~ vetch 15 plants Harwoodsons	– "			"	
BHMAD004	0702949	3718650		~~Harbonsons~~ Milk Vedge vetch 16+ plants Harwoodsons	– "			"	
BHMAD005 ~~AD002~~	0702951	3718595		~~Harbonsons~~ milk ~~vedge~~ vetch 25 plants Harwoodsons	– "			"	
BHMGL001	0702970	3718562		~~Harbonsons~~ Milk ~~vedge~~ vetch 50+ plants Harwoodsons	– "			"	
BMFGL002	0702943	3718514		MFL sub adult					

*See Reverse and Complete Data Sheet for Desert Tortoises for ALL LIVE TORTOISES!!!
**Coordinate Grid, UTM 11N, NAD 83

tree swallow, ~~Harbonson's~~ ~~Milk vedge~~, sage thrasher, violet green swallow
horn lark, ~~Harwoods~~

Site: Blythe Substation WBO

DESERT TORTOISE FIELD SURVEY DATA SHEET - FOCUSED SURVEY

Date: 3/14/10

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Easting Start	Easting End	Map #	Survey-or	GPS (Data)	Additional Surveyors and GPS Units	
			GLJ		ADA	15

	Time	Temp	Wind Sp/Dir	Weather & % Cloud
Start				
Mid-day				
End				

GPS Ident Code	GPS Easting**	GPS Northing**	Species	Comments	CLASS (1-5)	Burrow Suitable for (√=Yes): DT?	Wbo ?	Kfox ?	Badg ?
BHMGL002	0702764	3718537		H. Milk vedge 5 plants	- incorrect ID, not Harwood's				
BHMAD006	0702804	3718552		H. Milk vedge 8 plants	- "			"	
BHMAD007	0702797	3718615		H. Milk vedge ~~30~~ 50 plants	- "			"	
BMFAD003	0702785	3718617		M. F. L. sub adult	*				
BMFGL003	0702761	3718665		M. F. L. sub adult					
BHMAD008	0702797	3718729		H. Milk vedge 10 plants	- incorrect ID, not Harwood's				
BHMAD009	0702793	3718978		H. Milk vedge 25 plants	- "			"	
BHMAD010	0702792	3719025		H. Milk vedge 2 plants	- "			"	
BHMAD011	0702798	3719073		H. Milk vedge 65 plants	- "			"	
BHMAD012	0702684	3719055		H. Milk vedge 12+ plants	- "			"	

*See Reverse and Complete Data Sheet for Desert Tortoises for ALL LIVE TORTOISES!!!

**Coordinate Grid, UTM 11N, NAD 83

Site: Blythe Substation WBO

DESERT TORTOISE FIELD SURVEY DATA SHEET - FOCUSED SURVEY

Date: 3/19/10

Page 3 of 4 (8 10)

Easting Start	Easting End	Map #	Survey-or	GPS (Data)	Additional Surveyors and GPS Units	
			GLW		ADA	15

	Time	Temp	Wind Sp/Dir	Weather & % Cloud
Start				
Mid-day				
End				

GPS Ident Code	GPS Easting**	GPS Northing**	Species	Comments	CLASS (1-5)	Burrow Suitable for (√=Yes): DT?	Wbo ?	Kfox ?	Badg ?
BHMAD013	0702655	3718979		H. Milk vedge 20 plants	- incorrect ID, not Harwood's				
BHMAD019	0702655	3718925		H. Milk vedge 16 plants	- "		"		
BMFAD004	0702654	3718735		M.F.T.L. Adult					
BMFGL004	0702679	3718665		Subadult M.F.T.L.					
BHMAD015	0702651	3718640		H. Milk vedge ~~*~~ plants 5	- incorrect ID, not Harwood's				
BHMAD016	0702647	3718577		H. Milk vedge ~~*~~ plants 30/"	-	"			"
BHMAD017	0702648	3718526		H. Milk vedge 5 plants	-	"			"
BHMAD014	0702503	3718555		H. Milk vedge 5 plants	-	"		"	
BHMGL003	0702469	3718592		H. Milk vedge 5 plants	-	"		"	
BMFAD005	0702506	3718659		Subadult/MFTL					

*See Reverse and Complete Data Sheet for Desert Tortoises for ALL LIVE TORTOISES!!!

**Coordinate Grid, UTM 11N, NAD 83

Site: Blythe Substation WBG

DESERT TORTOISE FIELD SURVEY DATA SHEET [redacted] ~~Habitat Assessment~~

Date: 3/14/10

Page 4 of 4 10

Easting Start	Easting End	Map #	Survey-or	GPS (Data)	Additional Surveyors and GPS Units	
			GLU		ADA	15

	Time	Temp	Wind Sp/Dir	Weather & % Cloud
Start				
Mid-day				
End				

GPS Ident Code	GPS Easting**	GPS Northing**	Species	Comments	CLASS (1-5)	Burrow Suitable for (√=Yes): DT?	Wbo ?	Kfox ?	Badg ?
BHMAD019	0702498	3718749		H. Milk vedge 17 plants	- incorrect ID, not Hanwoods				
BHMAD020	0702501	3718882		H. Milk Vedge 7 plants		"		"	
BHMGL004	0702467	3718879		H. Milk vedge 1 plant	-	"		"	
BHMAD021	0702351	3718763		H. Milk vedge 10 plants		"			"
BHMGL005	0702382	3718740		" " " 1 plant		"		"	
BHMAD022	0702350	3718699		" " " 4 plants		"		"	
BHMGL006	0702381	3718695		" " " 20 "		"			"
BHMAD023	0702348	3718596		" " " 10 plants		"			"
BHMAD024	0702354	3718559		" " " 16 plants		"			"

*See Reverse and Complete Data Sheet for Desert Tortoises for ALL LIVE TORTOISES!!!

**Coordinate Grid, UTM 11N, NAD 83

DESERT TORTOISE FIELD SURVEY DATA SHEET - FOCUSED SURVEY

Site: Blythe Substation WBO Date: 3/14/10 Page 10 of 10

Easting Start	Easting End	Map #	Survey-or	GPS (Data)	Additional Surveyors and GPS Units	
				Small PC		

	Time	Temp	Wind Sp/Dir	Weather & % Cloud
Start	1:15	70	1-7 mph	0%
Mid-day				
End				

GPS Ident Code	GPS Easting**	GPS Northing**	Species	Comments	CLASS (1-5)	Burrow Suitable for (√=Yes): DT?	Wbo ?	Kfox ?	Badg ?
BMFEG001	0703011	3718858	MFTL	Adult					
BMFEG002	0703007	3718775	MFTL	~~MA~~ sub adult					
BMFEG003	0703017	3718661	MFTL	Adult					

*See Reverse and Complete Data Sheet for Desert Tortoises for ALL LIVE TORTOISES!!!
**Coordinate Grid, UTM 11N, NAD 83

N 9135
J 8505

START	0708882	/ 3720428	MOVING SOUTH (CLOCKWISE)
FINISH	0708882	/ 3720428	(END) @ START; LOOP COMPLETED

Site: BLYTHE

DESERT TORTOISE FIELD SURVEY DATA SHEET - FOCUSED SURVEY

Date: April 17, 2010

Page 1 of 3

Easting Start	Easting End	Map #	Survey-or	GPS (Data)	Additional Surveyors and GPS Units	
			SMA	CGE		
			SMC	RB		

CGE - CHARLES GERMAN RB - ROCKY BROWN

	Time	Temp	Wind Sp/Dir	Weather & % Cloud
Start	07:00	67	2-4 / W	HIGH OVERCAST 30%
Mid-day	13:15	92	3-6 / NE	HIGH OVERCAST 75%
End				

GPS Ident Code	GPS Easting**	GPS Northing**	Species	Comments	CLASS (1-5)	Burrow Suitable for (√=Yes): DT?	Wbo ?	Kfox ?	Badg ?
BHMRB013	0708899	3719662		2 GROUP ≈ 10M APART IN AREA OF OBVIOUS PONDING					
NOTE: @ 0708857 / 3719199 RAN INTO SOLAR PLANT - WALKED AROUND									
TO 0708676 / 3718949				BERM - UNTIL 500' ~~THEN~~ FOLLOWED FENCE TO TRACK					
BMACG020	0708802	3719212		↑ UNDER BUSH ↑ ~~and~~ SEE NOTE ABOVE		✓		✓	✓
BMACG021	0708688	3719208		UNDER PALO VERDE SEE NOTE ABOVE		✓		✓	✓
BMACG022	0703032	3718424		COULD BE EASILY EXCAVATED TO B.O.		✓	✓		
BMFCG026	0703131	3718412		SUB ADULT					
BMFRB007	0703091	3718437	MF	~~2 Adult~~ 2 ADULT					
BMFRB008	0702958	3718405		~~Adt~~ ADULT					
BMFCG027	0702806	3718421		SUB ADULT					

*See Reverse and Complete Data Sheet for Desert Tortoises for ALL LIVE TORTOISES!!!

**Coordinate Grid, UTM 11N, NAD 83

Site: BLYTHE

DESERT TORTOISE FIELD SURVEY DATA SHEET - FOCUSED SURVEY

Date: April 17, 2010

Easting Start	Easting End	Map #	Survey-or	GPS (Data)	Additional Surveyors and GPS Units	

	Time	Temp	Wind Sp/Dir	Weather & % Cloud
Start				
Mid-day				
End				

GPS Ident Code	GPS Easting**	GPS Northing**	Species	Comments	CLASS (1-5)	Burrow Suitable for (√=Yes): DT?	Wbo ?	Kfox ?	Badg ?
BMFRB009	0702577	3718825		SUB ADULT					
BMFCG028	0702772	3719088		SUB ADULT					
BMFRB010	0703166	3719111		SUB ADULT					
BMFCG029	0703332	3719123		ADULT					
BMFCG030	0703453	3719115		SUB ADULT					
BMFRB011	0703929	3719127		SUB ADULT					
BMFCG031	0704294	3719144		SUB ADULT					
BMFCG032	0704685	3719144		SUB ADULT					
BMFCG033	0704884	3719143		SUB ADULT					
BMFCG034	0705784	3719173		ADULT					

*See Reverse and Complete Data Sheet for Desert Tortoises for ALL LIVE TORTOISES!!!

**Coordinate Grid, UTM 11N, NAD 83

Site: BLYTHE

DESERT TORTOISE FIELD SURVEY DATA SHEET - FOCUSED SURVEY

Date: APRIL 17, 2010

Easting Start	Easting End	Map #	Survey-or	GPS (Data)	Additional Surveyors and GPS Units	

	Time	Temp	Wind Sp/Dir	Weather & % Cloud
Start				
Mid-day				
End				

GPS Ident Code	GPS Easting**	GPS Northing**	Species	Comments	CLASS (1-5)	Burrow Suitable for (√=Yes): DT?	Wbo ?	Kfox ?	Badg ?
BMFCG035 ~~BMCG035~~	0706235	3719181		SUB ADULT					
BMFCG036	0706291	3719183		SUB ADULT					
BDCRB004	0708196	3719850		1cm x 1cm W/SCUTE LINES MINERALIZED					
BDCCG005	0708197	3719911		2cm x 4cm MARGINAL MOSTLY MINERALIZED					
BDCRB005	0708761	3720694		2.5cm x 2.5cm TRIANGULAR MINERALIZED MARGINAL					

*See Reverse and Complete Data Sheet for Desert Tortoises for ALL LIVE TORTOISES!!!

**Coordinate Grid, UTM 11N, NAD 83

8420 MR	8480												
8430 AD	8490												
8440 MR	8500												
8450 MR	8510												
8460 MR	8520												
8470	8530												

DESERT TORTOISE FIELD SURVEY DATA SHEET - FOCUSED SURVEY

Site: Blythe

Date: 22 Apr 2010

Page 1 of 2

WO: 07084470, 3722355

Easting Start	Easting End	Map #	Survey-or	GPS (Data)	Additional Surveyors and GPS Units
708420	8530		~~A. Daugherty~~ ~~M.~~ M. R. Mathews	SM 11	~~M. Rathbun~~ A. DAUGHERTY SM D

	Time	Temp F	mph Wind Sp/Dir	Weather & % Cloud
Start	08:30	57°	5 W	95%
Mid-day				
End				

MAX WIND 0-5

GPS Ident Code	GPS Easting**	GPS Northing**	Species	Comments	CLASS (1-5)	Burrow Suitable for (√=Yes): DT?	Wbo ?	Kfox ?	Badg ?
BOOAD001	~~708431~~	~~3721442~~	Couch's Spadefoot	Couch's spadefoot toad potential breeding pool. 6x4 m; aurora					
—	708431	3721442		feeds into pond. Currently dry. Pool except 2' deep.					
BOOAD002	708428	3721950	Couch's Spadefoot	Potential breeding pool for Couch's spade foot toad. 8.0x5x1m					
BHMAD012	708435	3722080	Harwood's milkvetch	Few Harwood's milk vetch — 96 plants — in shallow aurora.					
BMAAD005	708432	3722312	MA	Mammal burrow — probably badger foraging burrow. 10x8 inches		✓	✓	✓	✓
BMAMR012	708421	3722509	MA	Mammal burrow — probably badger foraging burrow — 8x4 inches — 2 burrows		✓	✓	✓	✓
BDCAD021	708443	3722649	DT	4 shell fragments from adult tortoise. Marginal dermal pieces	5				
BMAMR013	708462	3722430	MA	Mammal burrow — potential badger foraging burrow — 8x4 inches		✓	✓		✓
BKBAD004	708457	3721910	KB	Kit fox burrow; 9 openings. No recent use.		✓	✓	✓	✓
BKBMR008	708477	3721437	KB	Kit fox burrow; 4 openings. Burrowing owl pellet present		✓	✓	✓	✓

*See Reverse and Complete Data Sheet for Desert Tortoises for ALL LIVE TORTOISES!!!

**Coordinate Grid, UTM 11N, NAD 83

8420 — 150' — 150' — +5 — 8527

~~Other~~ yellow-rumped warbler
~~Other~~ Ash-throated flycatcher
House finch
Turkey Vulture
MacGillivray's warbler

N: 3723620
C: 708475
+52
8423
8527

(51.66 m)

Side-blotched lizard
Zebra-tailed lizard
Whiptail lizard

Site: Blythe

DESERT TORTOISE FIELD SURVEY DATA SHEET - FOCUSED SURVEY

Date: 22 Apr 2010

Page 2 of 2

Uxo spider?: 0708504, 3721935

Easting Start	Easting End	Map #	Survey-or	GPS (Data)	Additional Surveyors and GPS Units	
7			MR	SM11	AD	SM D

	Time	Temp °F	Wind Sp/Dir MPH		Weather & % Cloud
Start					
Mid-day	1540	63°	1-4	SW	100
End	1800	63°	2-11	W	60

Mud Wasp

11 mph

GPS Ident Code	GPS Easting**	GPS Northing**	Species	Comments	CLASS (1-5)	Burrow Suitable for (√=Yes): DT?	Wbo ?	Kfox ?	Badg ?
BDCMR016	708468	3722630	DT	Shell fragments from adult Marginal 3x2 cm. 1 fragment not unique (2)	5				
BDCAD022	708526	3721595	DT	shell fragment from adult marginal 3x2 cm. not unique (2)	5				
BLSMR 002	708361	3723208	LS	Lesser head Shrike territorial behavior					
BMAAD 006	708357	3723158	MA	Appears to be a badger foraging burrow 7x4 inches		✓	✓		✓

*See Reverse and Complete Data Sheet for Desert Tortoises for ALL LIVE TORTOISES!!!

**Coordinate Grid, UTM 11N, NAD 83

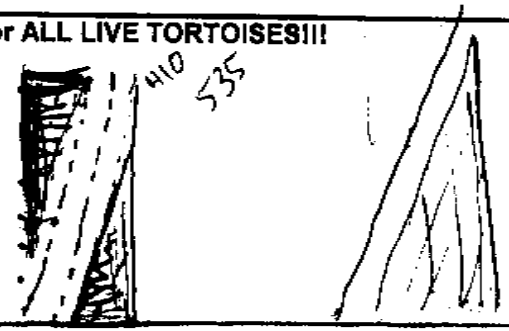
~~Morning dove~~

White-winged dove

Red-tailed hawk

Lesser head shrike

Gambels quail 480



Safety Meeting /Training Attendance Form

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Conducted by:	M. RATHBUN	**Date Performed:**	4/22/10
Topics Discussed:	1. (e.g., Review content of the HASP and Job Safety Analysis)		
	2. Hypothermia		
	3. Hydration		
	4. COMMUNICATION		

Printed Name	Signature	Organization
MICHAEL RATHBUN		SUB
DAN MCKUNWA		AECOM
Arthur Davenport	Arthur E. Davenport	DBS

430	AD	708420	AD	450	MR	410	AD	350	MR						
440	MR	430	MR	490	AD	400	MR	340	AD						
450		440	MR			390	MR								
460		450	AD			380	AD								
470		460	AD			370	AD								
480		470	MR			360	MR								

DESERT TORTOISE FIELD SURVEY DATA SHEET - FOCUSED SURVEY

Site: Blythe

Date: 23 Apr 2010

Page 1 of 1

T Line (N of I10)

N:3723620

Easting Start	Easting End	Map #	Survey-or	GPS (Data)	Additional Surveyors and GPS Units	
708420	708340		MR	11	AD	SMD

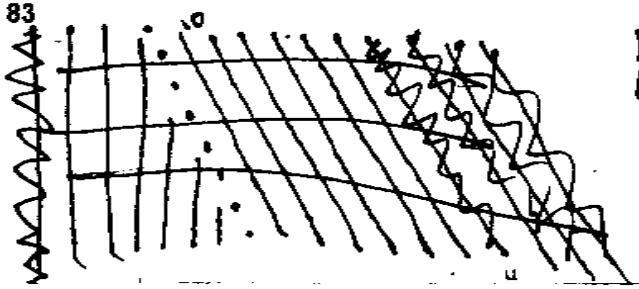
	Time	Temp	Wind Sp/Dir	Weather & % Cloud
Start	0830	61	4-7 SW	1
Mid-day				
End				

GPS Ident Code	GPS Easting**	GPS Northing**	Species	Comments	CLASS (1-5)	Burrow Suitable for (√=Yes): DT?	Wbo ?	Kfox ?	Badg ?
BLNMR001	708329	3723246	LN	Lesser head shrike; active nest; 7 eggs; 7 feet up; Ironwood.					

*See Reverse and Complete Data Sheet for Desert Tortoises for ALL LIVE TORTOISES!!!

**Coordinate Grid, UTM 11N, NAD 83

Zdrm-tailed lizard
Side-blotched lizard



Horned lark
Yellow-rumped warbler
House finch

150'

25 31/150

6 30/150

Site: BLYTHE

DESERT TORTOISE FIELD SURVEY DATA SHEET - FOCUSED SURVEY

Date: 4/23/2010

Page 1 of 1

1000 Buffer for T LINE

Easting Start	Easting End	Map #	Survey-or	GPS (Data)	Additional Surveyors and GPS Units	
708124	708830		MR	SM 11	A. Dimant	SM D

	Time	Temp	Wind Sp/Dir mph	Weather & % Cloud
Start				
Mid-day	14:47	80° F	0-1 W	10%
End	1730	82°	3-8 W	5%

GPS Ident Code	GPS Easting**	GPS Northing**	Species	Comments	CLASS (1-5)	Burrow Suitable for (√=Yes): DT?	Wbo ?	Kfox ?	Badg ?
BDPAD013	708117	3721131	DT	DT; potential pallet 8x4x12; good shape	5	✓			

*See Reverse and Complete Data Sheet for Desert Tortoises for ALL LIVE TORTOISES!!!

**Coordinate Grid, UTM 11N, NAD 83

Side-blotched lizard
Whip-tail lizard

Ash-throated flycatcher
Warbling Vireo
Gamble's Quail
White-crowned sparrow
Wilson's Warbler

Northern Mockingbird
Ash-throated flycatcher
Great-horned owl
House Finch

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Conducted by:	A Davenport	**Date Performed:**	4/23/10
Topics Discussed:	1. (e.g., Review content of the HASP and Job Safety Analysis)		
	2. Sun Protection		
	3. Hydration		
	4. Foot Prep.		

Printed Name	Signature	Organization
MIKE RATHBUN		SUB
Arthur Davenport	Arthur E. Davenport	DBS
DAN MCKINNON		AECOM

ERIC	START		0702879			3718561		→	CLOCKWISE		NORTHERN		BUFFER	LINE	
	END		0702913			3718649		→	COUNTER CLOCKWISE		4th		LINE 5		

DESERT TORTOISE FIELD SURVEY DATA SHEET - FOCUSED SURVEY

Site: BLYTHE Date: APRIL 24, 2010 Page 1 of 1

Easting Start	Easting End	Map #	Survey-or	GPS (Data)	Additional Surveyors and GPS Units	
702879			CGE	SM 11	MR	SM-D

	Time	Temp	mph Wind Sp/Dir	Weather & % Cloud
Start	13:00	82°F	2-4 /W	Clear 0%
Mid-day				
End	17:15	88°F	2-3 /W	clear 0%

CGE - ERIC GERMAN MR - MIKE RATHBUN

GPS Ident Code	GPS Easting**	GPS Northing**	Species	Comments	CLASS (1-5)	Burrow Suitable for (√=Yes): DT?	Wbo ?	Kfox ?	Badg ?
BMFCG101	0703688	3718968	MF	SUB ADULT					
BMFCG102	0703969	3719974	MF	SUB ADULT					
BMFCG103	0707061	3719048	MF	SUB Adult					
BMFMR011	0707073	3719024	MF	Adult					
BMFMR012	0706467	3719007	MF	Adult					
BMFCG104	0704900	3718909	MF	SUB ADULT					
BMFCG105	0707294	3718964	MF	SUB ADULT					
BMFMR013	0704754	3718927	MF	ADULT					
BMFMR014	0703326	3718899	MF	ADULT					

*See Reverse and Complete Data Sheet for Desert Tortoises for ALL LIVE TORTOISES!!!

**Coordinate Grid, UTM 11N, NAD 83

Blythe - 707400 E ~~[illegible]~~ do outer 5th line to this point, do all 5 lines after this point

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Conducted by:	ERIC GERMAN	**Date Performed:**	APRIL 24, 2010
Topics Discussed:	1. (e.g., Review content of the HASP and Job Safety Analysis) COMMUNICATION		
	2. HEAT STRESS		
	3. DEAD ANIMALS / HAZARDOUS ANIMALS		
	4.		

Printed Name	Signature	Organization
ERIC CHARLES GERMAN	[signature]	SUB AECOM

Site: BLYTHE

DESERT TORTOISE FIELD SURVEY DATA SHEET - FOCUSED SURVEY

Date: ~~4/24~~ 4/25

Easting Start	Easting End	Map #	Survey-or	GPS (Data)	Additional Surveyors and GPS Units	

	Time	Temp	Wind Sp/Dir		Weather & % Cloud
Start	07:30	69	1-3	VARIABLE	CLEAR 0%
Mid-day	11:30	84	1-3	VARIABLE	CLEAR 0%
End	16:30	94	4-8	W	CLEAR 0%

GPS Ident Code	GPS Easting**	GPS Northing**	Species	Comments	CLASS (1-5)	Burrow Suitable for (√=Yes): DT?	Wbo ?	Kfox ?	Badg ?
NOTE: DETOUR AROUND SOLAR PLANT									
START	0708610	3719115							
END	0708525	3718995							
B-METATE?	0709351	3719755		Potential ARCH (METATE?) no other rocks nearby so it really stood out flat or dished surface but not as smooth as most 16 X 10 inches.					
BOOMR100	0708072	3719032		long trench 20-30 feet wide 2 ft deep potential for Couch's spadefoot probably extends to levee near solar plant South East.					
BMFCG106	0706305	3718759	MF	SUB ADULT					
BMFCG107	0705389	3718738	MF	SUB ADULT					
BMFCG108	0704610	3718714	MF	SUB ADULT					
BMFCG109	0704581	3718711	MF	SUB ADULT					

*See Reverse and Complete Data Sheet for Desert Tortoises for ALL LIVE TORTOISES!!!

**Coordinate Grid, UTM 11N, NAD 83

- Desert Iguana
- COMMON SIDE-BLOTCHED LIZARD
- MOJAVE FRINGE TOED LIZARD
- COACHWHIP

Brewers Sparrows
Brewers Black Bird
Horned LARK
COMMON RAVEN
TURKEY VULTURE

DESERT TORTOISE FIELD SURVEY DATA SHEET - FOCUSED SURVEY

Site: _____ Date: _____

Easting Start	Easting End	Map #	Survey-or	GPS (Data)	Additional Surveyors and GPS Units	

	Time	Temp	Wind Sp/Dir	Weather & % Cloud
Start				
Mid-day				
End				

GPS Ident Code	GPS Easting**	GPS Northing**	Species	Comments	CLASS (1-5)	Burrow Suitable for (√=Yes): DT?	Wbo ?	Kfox ?	Badg ?
BMFCG110	0704528	3718706	MF	SUB ADULT					
BMFCG111	0704062	3718706	MF	SUB ADULT					
BMFMR100	0706170	3718904	MF	ADULT					
BMFMR101	0703164	3718834	MF	SUB ADULT					
BMFMR102	0703139	3718844	MF	ADULT					
BDCCG101	0705972	3718625	DETO	1" x 1" inch PLASTRON MINERALIZED PARTIALLY W/SCUTE	5				
BDCCG102	0705862	3718622	DETO	3/4" x 1.5" PLASTRON MINERALIZED FULL - PROBABLY LARGER TORTOISE THAN BDCCG101	5				
BMFCG112	0703162	3718627		SUB ADULT					
BMFCG113	0704050	3718645		SUB ADULT					
BMFCG114	0709198	3718652		SUB ADULT					

*See Reverse and Complete Data Sheet for Desert Tortoises for ALL LIVE TORTOISES!!!

**Coordinate Grid, UTM 11N, NAD 83

Site: Blythe

DESERT TORTOISE FIELD SURVEY DATA SHEET - FOCUSED SURVEY

Date: April 25 2010

Easting Start	Easting End	Map #	Survey-or	GPS (Data)	Additional Surveyors and GPS Units	
			CG	SM-15	MR	SM-F

	Time	Temp	Wind Sp/Dir	Weather & % Cloud
Start				
Mid-day				
End	16:30	94° F	4-8 mph/w	clear 0%

CG - ERIC GERMAN MR - MIKE RATHBUN

GPS Ident Code	GPS Easting**	GPS Northing**	Species	Comments	CLASS (1-5)	Burrow Suitable for (√=Yes): DT?	Wbo ?	Kfox ?	Badg ?
BHMMR100	0708707	3720499	HM	5 plants near road, dying off could be more,					

*See Reverse and Complete Data Sheet for Desert Tortoises for ALL LIVE TORTOISES!!!

**Coordinate Grid, UTM 11N, NAD 83

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Conducted by:	ERIC GERMAN	**Date Performed:**	04.25.10
Topics Discussed:	1. (e.g., Review content of the HASP and Job Safety Analysis) RECORDING REPORT REPORT SEE/AVOID/CALL UXO		
	2. CV		
	3. DEHYDRATION - WATER / WATER CONTAINER		
	4.		

Printed Name	Signature	Organization
ERIC GERMAN		SUB AECOM
MIKE RATHBUN		SUB
DAN MCMURRAY		AECOM

BURROWING OWL		BUFFER		T-LINE		NORTH		OF		I-10							

DESERT TORTOISE FIELD SURVEY DATA SHEET - FOCUSED SURVEY

Site: BLYTHE Date: APRIL 26, 2010 Page 1 of 2

Easting Start	Easting End	Map #	Survey-or	GPS (Data)	Additional Surveyors and GPS Units	

	Time	Temp	Wind Sp/Dir	Weather & % Cloud
Start	07:05	69	2-4 /W	CLEAR 0%
~~Mid-day~~				
End	14:10	87	2-4 /E	CLEAR 0%

GPS Ident Code	GPS Easting**	GPS Northing**	Species	Comments	CLASS (1-5)	Burrow Suitable for (√=Yes): DT?	Wbo ?	Kfox ?	Badg ?
BMACG101	0708581	3722480		9' x 9' (INCHES) WESTERN ORIENTATION - DOES NOT		✓	✓	✓	✓
				APPEAR ACTIVE - CAN NOT SEE END					
BNECG102	0708605	3721866	~~Lesser~~ NIGHT HAWK	Lesser Nighthawk nest under creosote next to Trash pile, 2 EGGS, East side					
BOOMR101	0708282	3721395		EVIDENCE OF POND, UP TO 2 feet of water for COUCH'S SPADE FOOT. 12 x 12 feet					
				MILKWEED PRESENT					
BMACG102	0708294	3721464		CAN NOT DETERMINE DEPTH 9" x 6" (Inches) - KF SCAT PRESENT	(OLD)	✓	✓	✓	✓
				NO SIGNS OF RECENT USE					
BLSMR100	0708291	3721763	LS	60 M E of point, IN CREOSOTE					
BHMMR101	0708261	3721566	HM	10 plants in wash near bank.		✓	✓	✓	✓
BMACG103	0708265	3722746		NW orientation of curved in burrow possibly KF, 9x12 inches		✓	✓	✓	✓

*See Reverse and Complete Data Sheet for Desert Tortoises for ALL LIVE TORTOISES!!!

**Coordinate Grid, UTM 11N, NAD 83

9" x 12 (inches) w T

- Desert Iguana
- SIDE-Blotch Lizard
- whiptail
- zebra-tailed lizard
- Speckled Rattlesnake
- Loggerhead Shrike
- Turkey Vulture
- Mourning Dove
- Round Tail Ground Squirrel
- LESSER NIGHTHAWK

Site: BLYTHE

DESERT TORTOISE FIELD SURVEY DATA SHEET - FOCUSED SURVEY

Date: April 26, 2010

Easting Start	Easting End	Map #	Survey-or	GPS (Data)	Additional Surveyors and GPS Units	

	Time	Temp	Wind Sp/Dir	Weather & % Cloud
Start				
Mid-day				
End				

GPS Ident Code	GPS Easting**	GPS Northing**	Species	Comments	CLASS (1-5)	Burrow Suitable for (√=Yes): DT?	Wbo ?	Kfox ?	Badg ?
BDBMR101	0708367	3721370	DT	potential tortoise burrow, 24 inches wide x 6 inches tall depth unknown,	4	✓	✓		
				flat bottom, currently unused southern orientation, embankment in wash of MA Burrow 3 Meter west,					
				9" wide x 4 inches tall		✓	✓		
NOTE: START EXTRA OWL LINE			WEST OF	30 METER WEST OF SMART FILE					
↳	0708250	3721122							
↳ END:	0708192	3723481							

*See Reverse and Complete Data Sheet for Desert Tortoises for ALL LIVE TORTOISES!!!

**Coordinate Grid, UTM 11N, NAD 83

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Conducted by:	ERIC GERMAN	**Date Performed:**	4/26/10
Topics Discussed:	1. (e.g., Review content of the HASP and Job Safety Analysis) COMMUNICATION		
	2. PUBLIC CONTACT		
	3. HEAT STRAIN / HEAT EXHAUSTION		
	4. RECOGNIZE RETREAT REPORT (UXO)		

Printed Name	Signature	Organization
ERIC GERMAN		SUB-AECOM
DAN MCKINNON		AECOM
MIKE RATHOUN		SUB

N-S

707925	7920	4280											
7935	7910	4290											
7945	7900	4300											
7955	4250	7880											
7965	4260	7870											
7975	4270	7860											

- 3650

DESERT TORTOISE FIELD SURVEY DATA SHEET - FOCUSED SURVEY

Site: BLYTHE

Date: 5/13/10

Page 1 of 1

Easting Start	Easting End	Map #	Survey-or	GPS (Data)	Additional Surveyors and GPS Units	
			GL	SM-11	MR	SM-D
					AD	SM-15

	Time	Temp	Wind Sp/Dir	Weather & % Cloud
Start	8:00	76° F	0-1 /	30% cloudy
Mid-day	11:00	86°F	2-6 /w	25% cloudy
End	16:00	90°F	4-6 /w	68% cloudy

GPS Ident Code	GPS Easting**	GPS Northing**	Species	Comments	CLASS (1-5)	Burrow Suitable for (√=Yes): DT?	Wbo ?	Kfox ?	Badg ?
BDBGL027	0707902	3722228	DT	15 inches w x 8 Tall, partial plug 2 feet in, no recent sign, NE facing under ironwood	2	✓	✓	✓	
BKBGL005	0707931	3722571	Kit Fox	3 openings, not active		✓	✓	✓	
BDSGL003	0707951	3722187	DT	1 scat, 0.5 x 0.5 inches, North side of ironwood	3				
BDBAD016	0707951	3722181	DT	collapsed DT Burrow near scat under ironwood.	4				

*See Reverse and Complete Data Sheet for Desert Tortoises for ALL LIVE TORTOISES!!!

**Coordinate Grid, UTM 11N, NAD 83

- 1130✓ 1160✓ 1190 180
1140✓ 1170✓ 1200 190
1150✓ 1180✓ 1210 200
~~168~~

LESSER NIGHTHAWK
Desert Iguana
Side-blotched Lizard
Whiptail Lizard
Zebra-tailed Lizard

ASH-THROATED Flycatcher
Black-throated Sparrow
Turkey Vulture
Mourning Dove
HOUSE FINCH

Site: Blythe

DESERT TORTOISE FIELD SURVEY DATA SHEET - FOCUSED SURVEY

Date: 5/14/10

Easting Start	Easting End	Map #	Survey-or	GPS (Data)	Additional Surveyors and GPS Units	
1000 DT + 3/4 mile buffer						

	Time	Temp	Wind Sp/Dir	Weather & % Cloud
Start	9:00 am	84°F	4-8 mph	0% cc
Mid-day	1:19 pm	93°F	0-2 mph	5%
End	6:20 pm	90°F	0-2 mph	5%

GPS Ident Code	GPS Easting**	GPS Northing**	Species	Comments	CLASS (1-5)	Burrow Suitable for (√=Yes): DT?	Wbo ?	Kfox ?	Badg ?
BDCGL026	0708475	3723935	DT	1 piece of tortoise bone. Marginal arm or leg socket bone. Mineralized. Next to trash dump (cans, broken glass) on desert pavement. 2" x 1"	5				
~~BDBE~~									
BDBEG001	0707791	3721898	DT	active tortoise burrow with tortoise inside. 16" x 6"	1	✓	✓		
BDLEG001	0707791	3721897	DT	adult male tortoise in burrow see health sheet.					
BDSMR001	0707791	3721899	DT	tortoise scat. trash. 4 pieces outside of burrow. 3 new, 1 old largest 1.5" x .5". all tightly packed. dark brown	1,2&3				
BDBMR011	0707856	3721875	DT	tortoise burrow + pellet. Near BDBEG001 16" x 8". can't see end of burrow. no sign. ~~[illegible]~~ tortoise. an old Kit fox complex which is collapsed. possibly tortoise.	5	✓	✓	✓	✓

*See Reverse and Complete Data Sheet for Desert Tortoises for ALL LIVE TORTOISES!!!

**Coordinate Grid, UTM 11N, NAD 83

Site: Blythe

DESERT TORTOISE FIELD SURVEY DATA SHEET - FOCUSED SURVEY

Date: 5/14/10

Easting Start	Easting End	Map #	Survey-or	GPS (Data)	Additional Surveyors and GPS Units	

	Time	Temp	Wind Sp/Dir	Weather & % Cloud
Start				
Mid-day				
End				

GPS Ident Code	GPS Easting**	GPS Northing**	Species	Comments	CLASS (1-5)	Burrow Suitable for (√=Yes): DT?	Wbo ?	Kfox ?	Badg ?
BDCGL027	0706479	3723891	DT	1 piece of tortoise bone in wash. from sub adult or small adult. not mineralized.	5				
~~BDCGL028~~				3/4" x 1/2" suture lines on bone.					
BDCGL028	0704296	3725816	DT	Piece of tort bone in an arroyo. plastron. in McCoy mountains	5				
				1" x 1". additional piece					
				found 20m down wash. 1/4 plastron intact					
				more pieces even further up wash					
				same animal as BDCGL028					
BDSGL004				3 tortoise scats in wash. big	2				
				scats from large tortoise. some odor					
				tightly packed medium brown.					
				1.5" x .5"					

*See Reverse and Complete Data Sheet for Desert Tortoises for ALL LIVE TORTOISES!!!

**Coordinate Grid, UTM 11N, NAD 83

DATA SHEET/HEALTH PROFILE FOR LIVE DESERT TORTOISES

Site Blythe
Located by Elizabeth G
UTMs 0707791 n 3721897 e

GPS Tortoise ID # BDLEG001
Date 5/14/10
Time 11:10 am Ground Temp 98°F

Tortoise Data
Body Measurements
MCL (mm) 292 mm PLN (mm) _____
New growth ☑ Yes ☐ No
likely male

Burrow Data
GPS ID # BDBEG001
Orientation South facing
Length unknown Width 16" Height 6"
UTMs 0707791 n 3721897 e

Cover Type	At cover site:	Not at cover site:
☑ burrow	☑ inside	☐ in open
☐ pallet	☐ entering	☐ other
☐ shrub	☐ exiting	
☐ caliche	☐ on mound	
☐ rock shelter		

Tortoise Activity	Behavior Notes
☑ resting	resting inside burrow.
☐ basking	
☐ walking	
☐ feeding	
Food item	

☐ interacting with other tortoise ↓
Other DT

Describe Interaction
gular is broken off. nasals looked dry. very ~~[illegible]~~ thick toe nails. chin glands not very swollen. likely male

Posture/Behavior	Yes	No	Unk
Alert, responsive	☑	☐	☐
Activity normal for season	☑	☐	☐
Lethargic	☐	☑	☐
Limbs/head hanging loose	☐	☑	☐
Can withdraw tightly into shell	☑	☐	☐

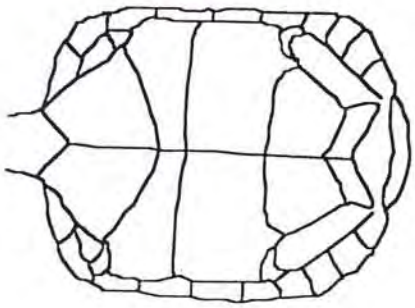
Trauma?	Yes	No	Unk
Head	☐	☑	☐
Gular	☑	☐	☐
Forelimbs	☐	☑	☐
Hindlimbs	☐	☑	☐
Shell	☐	☑	☐
Scute/bone replacement	☐	☑	☐

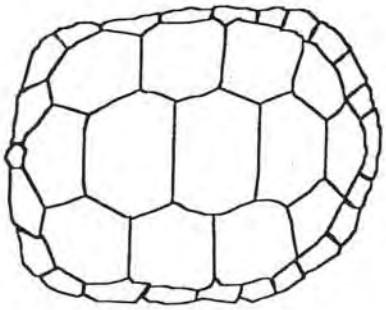
Integument	Yes	No	Unk
Dull	☐	☑	☐
Glossy	☑	☐	☐
Normal elasticity	☑	☐	☐
Skin peeling	☐	☑	☐

Breathing	Yes	No	Unk
Smooth	☐	☑	☐
Wheezing	☐	☑	☐
Rasping, clicking	☐	☑	☐

Eyes	Yes	No	Unk
Eyelids swollen	☐	☑	☐
Eyes whitened or discolored	☐	☑	☐
Eyes/lids wet	☐	☑	☐
Discharge	☐	☑	☐
Eyes sunken	☐	☑	☐
Eyes clear, bright	☑	☐	☐
Eyes dull, cloudy	☐	☑	☐

Beak & Nares	Yes	No	Unk
Wet	☐	☑	☐
Damp	☐	☑	☐
Exudate Present	☐	☑	☐
Bubbles	☐	☑	☐
One nare occluded	☐	☑	☐
Both occluded	☐	☑	☐
Dirt on nose/beak	☐	☑	☐
Dirt in nares	☐	☑	☐





DESERT TORTOISE FIELD SURVEY DATA SHEET - FOCUSED SURVEY

Site: 14 May 2010 Buffer Surveys

Date: 14 May 2010

Page 1 of 1

Easting Start	Easting End	Map #	Survey-or	GPS (Data)	Additional Surveyors and GPS Units	
			AD	15		

	Time	Temp F	Wind Sp/Dir	Weather & % Cloud
Start	0900	84	4-8/N	0
Mid-day				
End	1730			

GPS Ident Code	GPS Easting**	GPS Northing**	Species	Comments	CLASS (1-5)	Burrow Suitable for (√=Yes): DT?	Wbo ?	Kfox ?	Badg ?
BMAAD007	0708269	3722605	MA	May be badger foraging burrow		✓	✓	✓	✓
BDPAD021	0705139	3727027	DT	8x4x8 Pallet. In edge of arroyo, N facing slope	2	✓			
~~BDPAD022~~			~~DT~~						
BDBAD017	0704390	3727026	DT	12x6 - depth unknown. Burrow site in conglomerate clay bank of arroyo, Woodrat also present. South facing.	5	✓	✓		
BDCAD023	0704376	3727013	DT	Female - Adult. ≈ 25cm Photo # 28	4				
BDCAD024	0704374	3727005	DT	Female - large Adult - ≈ 30cm Photo # 29 - Almost Comp, disart.	5				
BDBAD018	0704319	3726203	DT	Burrow/shelter in conglomerate rock bank of arroyo - 4? more within 20 m, in same arroyo. 16x8 - depth unknown	2	✓	✓		

*See Reverse and Complete Data Sheet for Desert Tortoises for ALL LIVE TORTOISES!!!

**Coordinate Grid, UTM 11N, NAD 83

Round-tailed ground squirrel

Side blotched lizard
Desert Iguana
Collared lizard

Morning Dove
Lesser Nighthawk

1000 ft Buffer

707540															

Site: BLYTHE

DESERT TORTOISE FIELD SURVEY DATA SHEET - FOCUSED SURVEY

Date: 5/14/10

Page 1 of 2

Easting Start	Easting End	Map #	Survey-or	GPS (Data)	Additional Surveyors and GPS Units	
			MR	SM-D		

	Time	Temp	Wind Sp/Dir	Weather & % Cloud
Start	9:00 am	84°F	4-8 / NE	0% cloud
Mid-day	13:19	93°F	0-2 /	5% cloud
End				

GPS Ident Code	GPS Easting**	GPS Northing**	Species	Comments	CLASS (1-5)	Burrow Suitable for (√=Yes): DT?	Wbo ?	Kfox ?	Badg ?
BDBMR010	0707533	3722877	DT	7 inches wide x 4 inches tall, good initial shape but collapsed, could still be used as pallet, no recent sign of use, very flat entrance	4	✓			
BMAMR014	707519	3722879	MA	2 (6 inch x 6 inch holes) converge together not currently used, under creosote in wash face.		✓	✓	✓	
BKBMR009	0707611	3722838	Kit Fox	2 natural burrows and a large skylight not a lot of sign, some old scat, could be used by DT. 11 inches wide x 8 tall very large aprons, weedy, one looks used		✓	✓	✓	✓
BDPMR008	0707564	372721	DT	~~9 x 4 T x 11 D inches deep~~, 9 W x 4 T x 11 D (inches) looks good potential pallet for DT no sign, 2 rodent holes in back but lots of dirt apron.	5	✓			

*See Reverse and Complete Data Sheet for Desert Tortoises for ALL LIVE TORTOISES!!!

**Coordinate Grid, UTM 11N, NAD 83

Leopard Lizard
- whiptail Lizard
Side-Blotched Lizard
- collared Lizard

Lesser Nighthawk
Turkey Vulture
Rock WREN
COMMON POORWILL
Round-tailed Ground Squirrel
Desert Iguana

~~0707540, 3722878~~
0708575, 3721965

Site: BLYTHE

DESERT TORTOISE FIELD SURVEY DATA SHEET - FOCUSED SURVEY

Date: 5/14/10

Easting Start	Easting End	Map #	Survey-or	GPS (Data)	Additional Surveyors and GPS Units	
			MR	SM-D		

3/4 mile Buffer

	Time	Temp	Wind Sp/Dir	Weather & % Cloud
Start	9:00	84 F	4-9 /NE	0 % cloud
Mid-day	13:19	93 F	0-2	5 % cloud
End				

GPS Ident Code	GPS Easting**	GPS Northing**	Species	Comments (inches)	CLASS (1-5)	Burrow Suitable for (√=Yes): DT?	Wbo ?	Kfox ?	Badg ?
BDBMR012	0705624	3724255	DT	Rock shelter 10 w X 12 H X 6 ft deep, DT may have used, no recent sign or scat but high probability this was used at one time	5	✓			
BDBMR013	0705456	3724258	DT	2 burrows in wash wall one is 2X2 feet but narrows into tortoise shape cul is 6 feet deep(?) the other is 2 x 1.5 feet tall, less deep can not see end, no recent tortoise sign, bird tracks inside found in very Rocky wash	5	✓		✓	✓
BDBMR014	0704998	3724602	DT	Rock shelter 12 inches w X 9 inches tall, several feet deep, nice runway going to it, not unreasonable for DT to use but unclear who made it	5	✓	.	✓	
BMAMR015	0704710	3725947	MA	kit fox/Gray fox scat outside, under rock, tortoise may have used this can't tell how deep it is but 10 w x 5 Tall (inches)		✓		✓	

*See Reverse and Complete Data Sheet for Desert Tortoises for ALL LIVE TORTOISES!!!

**Coordinate Grid, UTM 11N, NAD 83

ATTACHMENT 5

SPREADSHEET OF DATA COLLECTED DURING FOCUSED DESERT TORTOISE SURVEYS SPRING 2010

SPREADSHEET OF DATA COLLECTED DURING FOCUSED DESERT TORTOISE SURVEYS SPRING 2010

Map Label	IDENT	Y_PROJ	X_PROJ	Date	Notes	Class
Adult Tortoise	BDLBH001	3726284	704485	14-MAR-10 11:22:37AM	Tortoise, live, adult, in burrow. 315 mm MCL. @ entrance to burrow, resting, like BDLGL001 from last year, burrow facing north, 330 mm width, caliche in area	1
Adult Tortoise	BDLGL001	3724461	706258	19-MAR-10 1:10:51PM	Adult male tortoise, in drainage at entrance to burrow, under large creosote. Shell very worn and peeling, 13" MCL. See datasheets.	
Adult Tortoise	BDLAD001	3723077	705058	31-MAR-10 11:08:20AM	Adult male tortoise in BDBAD012. see health sheet. MCL about 10"	
Adult Tortoise	BDLEG001	3721897	707793	14-MAY-10 11:07:00AM	Adult tortoise, likely male, in BDBEG001, MCL = 292 mm, 11.5", trauma to gular (broken off), nares dry, very thick toenails, chin glands not very swollen, but still likely a male, resting in burrow	
Adult Tortoise - Second Observation	BDLSD001	3724362	706268	20-MAR-10 12:58:51PM	Same as BDLGL001, walking fast on desert pavement, male, fat tail. Ground temp = 79 degrees F. MCL 12", PLN 8.5"	
Badger Burrow	BMADT002	3724381	707954	15-MAR-10 4:36:53PM	1 round burrow, prob. badger. End not seen.	
Badger Burrow	BGBWV001	3725015	706946	21-MAR-10 2:19:45PM	Single 12 x 10" burrow at base of wash bank overhanging. Badger claw marks evident.	
Badger Burrow	BGBRSOO1	3725636	706941	23-MAR-10 1:18:04PM	Badger burrow under ironwood. Active, freshly disturbed soil. Round with claw marks.	
Badger Burrow	BGBRS001	3723790	708682	24-MAR-10 1:43:58PM	Fresh, active badger burrow. Claw marks visible. Can't see the end.	
Badger Burrow	BGBBH001	3727806	705050	31-MAR-10 3:07:29PM	Recently active badger burrow. Claw marks visible on burrow roof.	
Barrel Cactus	BBCGL001	3723886	704417	01-APR-10 9:30:58AM	1 cactus, 2 inches tall	
Barrel Cactus	BBCDT001	3724005	704393	01-APR-10 9:36:32AM	1 cactus, 6 heads, ~23 inches tall	
Barrel Cactus	BBCGL002	3724085	704365	01-APR-10 9:41:33AM	1 cactus, 19" tall	
Barrel Cactus	BBCDT002	3724143	704364	01-APR-10 9:44:50AM	2 cacti ~2 meters apart, ~24" tall. Approx. 20 more barrel cactus visible on steep slopes of mountain within ~200 meters	

Map Label	IDENT	Y_PROJ	X_PROJ	Date	Notes	Class
Barrel Cactus	BBCDT003	3722928	705753	06-APR-10 10:23:23AM	1 cactus, ~ 9 in. tall, dead. 5 other barrel cactus visible on this slope within ~ 30 m.	
Barrel Cactus	BBCMR001	3723187	705621	06-APR-10 11:00:24AM	8-10 cacti on south facing slope approximately 50 m. north of this point.	
Barrel Cactus	BBCAD001	3727279	705489	29-MAR-10 1:33:14PM	4" tall, under ironwood	
Burrow with Badger Sign	BMAWV004	3724840	707307	20-MAR-10 10:26:08AM	9x9" opening, unknown depth. Badger hole. Recent dist	
Burrow with Badger Sign	BMAWV003	3725298	707374	20-MAR-10 9:57:17AM	1 9x9" opening, unknown depth. Badger hole. Recent, possible Active den	
Burrow with Badger Sign	BMAWV006	3724403	707122	21-MAR-10 9:02:59AM	Single opening, 11 x 10". Ends after 24". Badger foraging burrow.	
Burrowing Owl Burrow with Sign	BBBAD001	3719388	703425	14-MAR-10 5:05:23PM	Two burrows, 6 x 5", 5 x 5", old whitewash, pellets, off-site	
Burrowing Owl Burrow with Sign	BBODT001	3725241	706298	20-MAR-10 11:21:59AM	Burrowing owl whitewash on haul out. Two collapsed burrows.	
Burrowing Owl Burrow with Sign	BKDAD002	3725775	706414	21-MAR-10 9:38:08AM	Burrowing owl whitewash and pellets present. Active. Old KF scat present.	
Cooper's Hawk	BCORK001	3718547	702012	03-APR-10 10:29:57AM	3 adult Cooper's hawks. Accipiter with long rounded tail, soaring.	
Creosote Ring	CREOSOTE RING	3724726	705948	17-MAR-10 10:23:09AM		
Creosote Ring	CREOSOTE RING2	3724675	705997	17-MAR-10 12:10:18PM		
Ferruginous Hawk	BFEBH001	3719589	703526	02-APR-10 8:51:07AM	1 female/juvenile ferruginous hawk flying overhead, headed N/NW	
Fossilized Turtle/Tortoise Bone	BDCGL006	3725282	706247	19-MAR-10 12:16:46PM	Tortoise/turtle fossil, marginals, plastron, 20+ fragments, adult, carapace.	5
Harwood's Milkvetch	BHMDT004	3717141	703854	02-APR-10 3:02:01PM	6 in a 200 meters arc plus 6 more about 10 meters east	
Harwood's Milkvetch	BHMDT001	3720694	704133	02-APR-10 8:52:12AM	~12 individuals in ephemeral wash.	
Harwood's Milkvetch	BHMDT002	3720988	702477	02-APR-10 9:40:44AM	~ 20 individuals in disturbed area proximate to I-10 fence.	
Harwood's Milkvetch	BHMAD011	3725565	709660	02-APR-10 9:42:35AM	One plant	

Map Label	IDENT	Y_PROJ	X_PROJ	Date	Notes	Class
Harwood's Milkvetch	BHMDT003	3720988	702422	02-APR-10 9:47:34AM	~100+ along disturbed area adjacent to/juxtaposed with I-10 fence	
Harwood's Milkvetch	BHMMR003	3722516	710280	06-APR-10 4:06:09PM	5 plants adjacent to old tarmac within 1 meter.	
Harwood's Milkvetch	BHMMR004	3722328	710096	06-APR-10 4:16:24PM	~ 30 plants within 5 m.	
Harwood's Milkvetch	BHMMR005	3722003	709156	06-APR-10 4:45:16PM	1 plant.	
Harwood's Milkvetch	BHMRB010	3721517	710318	07-APR-10 1:02:01PM	2 plants in disturbed area adjacent to trucking yard.	
Harwood's Milkvetch	BHMDT006	3728189	713180	07-APR-10 1:57:05PM	~20 plants in vegetated patch in pavement.	
Harwood's Milkvetch	BHMRK001	3721259	710108	07-APR-10 10:44:05AM	1 plant.	
Harwood's Milkvetch	BHMRK002	3721265	710171	07-APR-10 10:47:12AM	60 plants in this area.	
Harwood's Milkvetch	BHMRB001	3721304	710563	07-APR-10 10:51:57AM	4 plants at the base of an asphalt pile.	
Harwood's Milkvetch	BHMRK003	3721267	710327	07-APR-10 10:56:11AM	3 plants.	
Harwood's Milkvetch	BHMRK004	3721277	710491	07-APR-10 10:59:51AM	2 plants.	
Harwood's Milkvetch	BHMMR007	3724731	711840	07-APR-10 11:31:34AM	2 plants.	
Harwood's Milkvetch	BHMRB002	3721366	708319	07-APR-10 11:52:20AM	6 plants adjacent to wash, +1 plant ~30 m. northwest adjacent to creosote bush.	
Harwood's Milkvetch	BHMRK005	3721316	710035	07-APR-10 12:04:58PM	8 plants.	
Harwood's Milkvetch	BHMDT005	3724040	710669	07-APR-10 12:12:32PM	11 plants.	
Harwood's Milkvetch	BHMRB003	3721558	709590	07-APR-10 12:28:09PM	~100 plants in open area with widely scattered creosote bush. Plants growing in narrow strip of finer substrate ~1 m. wide x 100 m. long.	
Harwood's Milkvetch	BHMRB004	3721554	709652	07-APR-10 12:34:46PM	14 plants in finer substrate (slightly mounded) with substantial herbaceous growth.	
Harwood's Milkvetch	BHMRB005	3721538	709742	07-APR-10 12:39:33PM	1 plant in fine substrate with other herbaceous species.	

Map Label	IDENT	Y_PROJ	X_PROJ	Date	Notes	Class
Harwood's Milkvetch	BHMRB006	3721528	709812	07-APR-10 12:43:26PM	1 plant + 15 plants ~25 M. east-southeast.	
Harwood's Milkvetch	BHMRB007	3721514	709861	07-APR-10 12:48:13PM	1 plant.	
Harwood's Milkvetch	BHMRB008	3721501	709957	07-APR-10 12:51:24PM	5 plants.	
Harwood's Milkvetch	BHMRB009	3721505	710027	07-APR-10 12:54:32PM	7 plants.	
Harwood's Milkvetch	BHMMR008	3728859	713123	07-APR-10 2:14:43PM	1 plant.	
Harwood's Milkvetch	BHMMR006	3724684	711173	07-APR-10 8:29:33AM	5 plants.	
Harwood's Milkvetch	BHMBH005	3721234	709679	07-APR-10 9:07:04AM	6 plants. Harwood's milk vetch. Fruit not densely hairy. Plants with small dark purple flowers.	
Harwood's Milkvetch	BHMBH006	3721240	709515	07-APR-10 9:16:51AM	16 plants.	
Harwood's Milkvetch	BHMRB011	3731261	710651	08-APR-10 2:30:45PM	5 plants in shallow braided wash with scattered creosote bush, bursage.	
Harwood's Milkvetch	BHMMR009	3730613	713328	08-APR-10 8:29:24AM	2 plants in open area with sparse vegetative cover.	
Harwood's Milkvetch	BHMBH007	3719687	708544	12-APR-10 3:43:30PM	3 plants.	
Harwood's Milkvetch	BHMRB012	3719714	708553	12-APR-10 3:45:28PM	7 plants.	
Harwood's Milkvetch	BHMMR010	3720423	708550	13-APR-10 10:53:55AM	6 plants north of power line road in small wash.	
Harwood's Milkvetch	BHMKF001	3719606	708679	13-APR-10 2:06:41PM	~10 plants + ~ 6 plants 30 m. east, in a slight depression.	
Harwood's Milkvetch	BHMRB013	3719662	708900	17-APR-10 7:28:42AM	2 grown about 10 m apart in area of obvious ponding	
Harwood's Milkvetch	BHMAD012	3722080	708437	22-APR-10 9:42:30AM	Harwood's milkvetch, 36 plants in shallow area	
Harwood's Milkvetch	BHMGL001	3724621	708695	24-MAR-10 2:11:33PM	5 plants, flower and fruit. Sandy spot in pavement	
Harwood's Milkvetch	BHMGL002	3724872	708694	24-MAR-10 2:25:21PM	1 plant, flower and fruit. Sandy spot in pavement	

Map Label	IDENT	Y_PROJ	X_PROJ	Date	Notes	Class
Harwood's Milkvetch	BHMBH001	3725172	708664	24-MAR-10 2:30:25PM	20 plants.	
Harwood's Milkvetch	BHMAD001	3725231	708682	24-MAR-10 2:36:46PM	2 plants, flower and fruit. Sandy spot in pavement	
Harwood's Milkvetch	BHMAD002	3724613	708710	24-MAR-10 2:55:05PM	~20 plants, flower and fruit. Sandy spot in pavement	
Harwood's Milkvetch	BHMAD003	3724549	708711	24-MAR-10 3:02:16PM	12 plants, flower and fruit. Sandy spot in pavement	
Harwood's Milkvetch	BHMAD004	3724427	708767	24-MAR-10 4:03:53PM	5 plants, flower and fruit. Sandy spot in pavement	
Harwood's Milkvetch	BHMAD005	3724671	708772	24-MAR-10 4:18:45PM	1 plant in silty pocket on desert pavement	
Harwood's Milkvetch	BHMAD006	3725223	708783	24-MAR-10 4:37:31PM	3 plants in silty wash	
Harwood's Milkvetch	BHMAD008	3725073	708781	24-MAR-10 4:42:30PM	1 plant in silty wash	
Harwood's Milkvetch	BHMMR100	3720498	708708	25-APR-10 4:34:02PM	Harwood's milkvetch, 5 plants near road, dying off, could be more	
Harwood's Milkvetch	BHMBH002	3725249	708842	25-MAR-10 11:01:28AM	Harwood's milkvetch. Single plant in a washlet. Small, deep violet flowers	
Harwood's Milkvetch	BHMBH003	3725165	708992	25-MAR-10 2:04:20PM	Harwood's milkvetch. Deep violet flowers. 5 plants at this location.	
Harwood's Milkvetch	BHMBH004	3725238	708992	25-MAR-10 2:08:46PM	Harwood's milkvetch. 4 plants.	
Harwood's Milkvetch	BHMGL003	3725190	709030	25-MAR-10 3:45:36PM	Single plant.	
Harwood's Milkvetch	BHMAD009	3724941	708851	25-MAR-10 9:07:24AM	11 plants in drainage on desert pavement.	
Harwood's Milkvetch	BHMAD010	3724488	708856	25-MAR-10 9:24:35AM	11 plants in drainage on desert pavement.	
Harwood's Milkvetch	BHMMR101	3721565	708262	26-APR-10 10:26:01AM	10 Harwood's milkvetch plants in wash, near bank	
Harwood's Milkvetch	BHMSD001	3726900	708921	27-MAR-10 9:27:36AM	11 plants, purple flowers with pods. More within area.	
Harwood's Milkvetch	BHMMR001	3726922	712320	30-MAR-10 9:39:57AM	2 plants, more at 072280/3726890	

Map Label	IDENT	Y_PROJ	X_PROJ	Date	Notes	Class
Harwood's Milkvetch	BHMMR002	3727218	712300	31-MAR-10 8:10:07AM	4 plants	
Kit Fox Burrow	BKBRK002	3727083	705819	01-APR-10 10:04:13AM	9" wide x 11", end unk. Recently active, but no fresh tracks (soil covers this year's annual veg). At the base of a small narrow drainage.	
Kit Fox Burrow	BXKBBH002	3725036	706432	10-APR-10 12:26:46PM	Active kit fox burrow. 11 in. w x 12 in. h x end unknown.	
Kit Fox Burrow	BKBBH001	3724237	707432	19-MAR-10 2:47:00PM	9" wide x 8" tall, evidence of canid digging. Kit fox scat at opening. One opening.	
Kit Fox Burrow	BKBBH002	3724188	707436	19-MAR-10 2:54:32PM	Active, fresh scat in front. Disturbed soil. 9" wide by 5" tall, in bank of wash.	
Kit Fox Burrow	BKBDT002	3727227	705558	29-MAR-10 11:37:53AM	Possible KF burrow, narrows quickly though	
Kit Fox Burrow	BKBDT003	3727192	705530	29-MAR-10 11:56:49AM	Potential KF burrow, one collapsed, other turns to right	
Kit Fox Burrow	BKBGL004	3728180	704707	29-MAR-10 9:08:26AM	Large opening, but turns like KF burrow	
Kit Fox Burrow	BKBMR003	3726874	711481	30-MAR-10 10:39:39AM	Potential KF burrow, fresh digging. Dead tree above.	
Kit Fox Burrow	BKBSD002	3726632	711510	30-MAR-10 10:52:32AM	One KF burrow in berm, no scat	
Kit Fox Burrow	BKBMR004	3726879	711574	30-MAR-10 11:08:36AM	2 burrows in berm, plus 3 burrows 10 M to east with weeds at entrance	
Kit Fox Burrow	BKBBH004	3725441	707105	21-MAR-10 10:30:03AM	Inactive KF burrow, veg growing in entrance. 11 x 9". End not seen.	
Kit Fox Burrow	BKBBH005	3725475	707098	21-MAR-10 10:35:36AM	11 x 12.5", end not seen. Inactive KF burrow, veg growing in entrance.	
Kit Fox Burrow	BKBBH003	3725589	707171	21-MAR-10 8:21:10AM	Active kit fox burrow, 1 opening, 12 x 7", end not seen, KF scat at entrance	
Kit Fox Burrow Complex	BKBGL003	3724899	706364	20-MAR-10 1:23:23PM	Three burrows under creosote, lots of KF scat, some fresh	
Kit Fox Burrow Complex	BKBMR001	3725038	706432	21-MAR-10 11:34:12AM	3 openings, 1 entrance. KF burrow.	
Kit Fox Burrow Complex	BKBAD002	3724920	706519	21-MAR-10 6:12:18PM	KF burrow, 4 openings.	
Kit Fox Burrow Complex	BKBDT001	3724654	706716	22-MAR-10 10:57:03AM	Active KF complex, scat, tracks, etc. 8+ burrows.	

Map Label	IDENT	Y_PROJ	X_PROJ	Date	Notes	Class
Kit Fox Burrow Complex	BKBAD003	3724594	708777	24-MAR-10 4:11:21PM	4 openings - active complex. Tracks and scat	
Kit Fox Complex	BKBDT005	3719352	700410	02-APR-10 11:29:00AM	~6 openings, tracks, old and fresh scat	
Kit Fox Complex	BKBCG001	3720043	704552	02-APR-10 4:30:07PM	old KF scat. 6+ openings, veg in some	
Kit Fox Complex	BKBMA001	3719869	704158	02-APR-10 8:41:55AM	6 openings, old KF scat	
Kit Fox Complex	BKBMR005	3727738	704867	05-APR-10 2:27:23PM	2 openings. Largest: 18 in. w x 18 in. h x unknown depth. Based on annual vegetation on spoil, this burrow was active last year. Kit fox scat out front.	
Kit Fox Complex	BKBBH006	3727846	704883	05-APR-10 2:35:35PM	Exact same sign as BKBMR005. 3 openings: 11 in. w x 10 in. h x unknown depth.	
Kit Fox Complex	BKBMR006	3727905	704882	05-APR-10 2:40:59PM	Active kit fox natal complex. Fresh scat and spoil. 4 openings: 5 in. w x 7 in. h x unknown depth.	
Kit Fox Complex	BKBMR007	3724175	710373	06-APR-10 3:24:09PM	Active kit fox complex in small, artificial berm. 9 openings, kit fox scat and tracks present.	
Kit Fox Complex	BXKBBH001	3724920	706520	10-APR-10 9:39:19AM	4 openings and1 mostly collapsed entrance. 7 in. w x 8 in. h x unknown depth. All entrances are currently inactive.	
Kit Fox Complex	BKBAD010	3725353	708843	10-MAR-10 11:56:09AM	6 collapsed kit fox burrows, KF scat. Recent stream flowed into burrows; check later for BUOW.	
Kit Fox Complex	BKBKF001	3719783	708467	13-APR-10 8:12:11AM	2 openings, fresh tracks but no other sign. 10" wide x 8" tall, 6" wide x 9" tall.	
Kit Fox Complex	BKBGL005	3722571	707932	13-MAY-10 10:18:22AM	Kit fox complex, 3 openings, not active	
Kit Fox Complex	BKBGL002	3723649	707933	15-MAR-10 4:09:40PM	KF complex, 3 good openings, several collapsed. Old KF scat, no BUOW sign.	
Kit Fox Complex	BKBAD001	3723835	707934	15-MAR-10 4:15:34PM	KF complex. 3 openings, lots of ld KF scat, no BUOW sign	
Kit Fox Complex	BKBGL001	3724672	708192	15-MAR-10 9:19:38AM	Kit for complex, large burrows. 5 openings. Old KF scat. No BUOW sign.	
Kit Fox Complex	BKBRK001	3723788	707871	18-MAR-10 10:27:35AM	9 openings spread across 12-15 meters. No obvious BUOW sign.	
Kit Fox Complex	BKBAD004	3721910	708458	22-APR-10 11:14:24AM	Kit fox burrow, 9 openings, no recent use	

Map Label	IDENT	Y_PROJ	X_PROJ	Date	Notes	Class
Kit Fox Complex	BKBDT004	3726782	711492	30-MAR-10 10:44:42AM	Four burrows in berm, KF complex, no scat	
Kit Fox Complex	BKBMR002	3726891	712153	30-MAR-10 9:56:04AM	3 KF burrow along berm. KF scat, active.	
Kit Fox Complex	BKBMR009	3722837	707613	14-MAY-10 9:53:57AM	Two natural burrows and large skylight, not a lot of sign, some old scat, could be used by tortoise, 11" wide x 8" tall, very large aprons, weedy, one looks used	
Kit Fox Complex Burrowing Owl Sign	BKBMR008	3721436	708478	22-APR-10 11:37:26AM	Kit fox burrow, 4 openings, burrowing owl pellet present	
Loggerhead Shrike	BLSBH006	3719359	702029	02-APR-10 12:42:22PM	1 bird perched on a creosote, calling and scolding.	
Loggerhead Shrike	BLSRK001	3718794	702055	02-APR-10 5:40:58PM	1 bird perched, calling	
Loggerhead Shrike	BLSBH007	3726540	704357	06-APR-10 4:03:12PM	1 bird perched and calling.	
Loggerhead Shrike	BLSMR001	3731571	706655	08-APR-10 12:28:43PM	Perched on a palo verde ~ 100 m. east of main north-south access road.	
Loggerhead Shrike	BLSBH008	3731587	705938	08-APR-10 8:59:04AM	1 bird perched on a palo verde tree.	
Loggerhead Shrike	BLSBH009	3718748	703921	12-APR-10 11:32:30AM	1 bird perched and calling from a creosote bush.	
Loggerhead Shrike	BLSBH003	3723942	708027	15-MAR-10 2:25:33PM	Single bird perched in ironwood.	
Loggerhead Shrike	BADLS001	3723708	708170	16-FEB-10 5:12:15PM	Resident loggerhead shrike, perched, hunting in ironwood	
Loggerhead Shrike	BLSBH001	3725340	708175	17-FEB-10 7:38:22AM	Resident loggerhead shrike, calling	
Loggerhead Shrike	BLSBH002	3724755	706943	17-FEB-10 9:48:49AM	Loggerhead shrike, flying north, resident	
Loggerhead Shrike	BLSAD001	3725114	706131	18-MAR-10 10:11:58AM	Loggerhead shrike doing territorial display.	
Loggerhead Shrike	BLSMR002	3723208	708362	22-APR-10 5:44:55PM	Loggerhead shrike, territorial behavior	
Loggerhead Shrike	BLSMR100	3721762	708292	26-APR-10 10:23:59AM	Loggerhead shrike, 60 m east of point, in creosote	

Map Label	IDENT	Y_PROJ	X_PROJ	Date	Notes	Class
Loggerhead Shrike	BLSBH005	3727144	712297	31-MAR-10 11:05:01AM	Single bird perched in a Palo Verde	
Loggerhead Shrike	BLSBH004	3728186	711571	31-MAR-10 9:51:49AM	1 male singing in ironwood tree	
Loggerhead Shrike Nest	BLNMR001	3723245	708330	23-APR-10 10:28:36AM	Loggerhead shrike active nest, 7 eggs, 7 feet up, ironwood	
Mammal Burrow	BMAMR005	3727169	705838	01-APR-10 10:02:02AM	Under ironwood tree, no scat or tracks	
Mammal Burrow	BMAMR006	3727163	705860	01-APR-10 10:23:59AM	2' deep, north facing. 10 feet above wash in 45 degree slope, some old whitewash	
Mammal Burrow	BMADT008	3724514	704307	01-APR-10 10:50:41AM	Small cavern in rock face on steep slope of mountain, ~36" x 36", narrows, but end not seen. Canid scat in entrance; floor of burrow rocky.	
Mammal Burrow	BMAGL003	3725583	709350	02-APR-10 10:09:06AM	RTGS complex, potential for BUOW, KF scat	
Mammal Burrow	BMACG002	3720955	701713	02-APR-10 10:09:56AM	Fresh KF scat and prints -- active. ~15x15 cm.	
Mammal Burrow	BMACG003	3716907	702281	02-APR-10 2:02:56PM	5 openings, 15 x 15 cm. No scat	
Mammal Burrow	BMACG004	3717134	703829	02-APR-10 2:58:47PM	Coyote -- 35x25 cm with tracks	
Mammal Burrow	BMACG001	3720763	704058	02-APR-10 8:57:51AM	15cm x 15cm, +1 meter deep	
Mammal Burrow	BMAAD004	3725559	709473	02-APR-10 9:21:18AM	RTGS complex with burrows large enough for BUOW, plus additional burrows to east	
Mammal Burrow	BMARK005	3725466	708666	04-APR-10 1:29:51PM	10" w X 9" h X unknown depth (inches). Coyote scat out front. Inactive.	
Mammal Burrow	BMADT009	3725599	709633	04-APR-10 12:28:52PM	Borderline burrowing owl suitability. Round-tailed ground squirrel active colony. Eight burrow openings at this location. Juvenile tortoise suitability.	
Mammal Burrow	BMAMR007	3727344	705108	05-APR-10 2:00:40PM	2 canid digs, 4 feet apart. 12 in. w x 10 in. h x 24in. deep. Inactive.	
Mammal Burrow	BMAMR008	3722793	705854	06-APR-10 10:03:56AM	Excavation under rock ledge, 30 x 8 in., ~3 ft. deep. Bird and canid scat inside, possibly gray fox.	
Mammal Burrow	BMADT010	3725424	712598	07-APR-10 11:03:55AM	Round-tailed ground squirrel colony, 5-6 openings, marginal for WBO.	

Map Label	IDENT	Y_PROJ	X_PROJ	Date	Notes	Class
Mammal Burrow	BMAMR011	3729855	713148	07-APR-10 2:41:10PM	Large dig in base of wash, 12 x 20 in., ends after ~ 6 ft.	
Mammal Burrow	BMADT011	3730214	713117	07-APR-10 2:54:13PM	8 x 8 in., makes right turn and end not seen. Some veg in entrance.	
Mammal Burrow	BMAMR010	3724565	710958	07-APR-10 8:20:35AM	~ 4 x 4 in, marginal for WBO. Some veg in entrance.	
Mammal Burrow	BMARB002	3731080	712187	08-APR-10 3:15:36PM	12 in. x 12 in. burrow entrance. Curves left after ~ 1 m. One small piece of coyote scat outside entrance. Likely coyote burrow. Burrow under creosote bush.	
Mammal Burrow	BMARK006	3731188	705863	08-APR-10 3:49:30PM	11 in. w x 8 in. h x unknown depth. Not active. Origins uncertain.	
Mammal Burrow	BMABH014	3731569	705023	08-APR-10 9:17:20AM	7 in. w x 7 in. h x unknown depth. Inactive, origins unknown.	
Mammal Burrow	BXMACG001	3724972	706638	10-APR-10 11:11:20AM	Fresh kit fox scat. Nice 24 in. x 24 in. x 60 in. deep. Excavated flat bottom	
Mammal Burrow	BMAGL001	3723512	707557	10-MAR-10 2:09:48PM	Large burrow entrance, collapsed. May go in further to left. Old KF scat.	
Mammal Burrow	BMACG006	3719464	708528	12-APR-10 8:29:26AM	8 x 6 in., end not seen. In dense Saharan mustard.	
Mammal Burrow	BMAMR012	3719423	708714	13-APR-10 1:55:27PM	Under a creosote shrub. 7" wide x 7" tall.	
Mammal Burrow	BMAKF001	3719730	708621	13-APR-10 11:20:11AM	1 opening, not active. 5" wide, 6" tall.	
Mammal Burrow	BMAKF002	3719141	708499	13-APR-10 11:44:37AM	1 opening in berm. 7" wide x 7.5" tall, goes in ~4' and turns to right.	
Mammal Burrow	BMADT001	3718637	702921	14-MAR-10 2:07:09PM	one burrow, 5" x 5", good condition	5
Mammal Burrow	BMABH001	3718974	702291	14-MAR-10 4:19:32PM	Desert kangaroo rat burrow on south side of a dune mound, marginal for burrowing owl	
Mammal Burrow	BMAAD001	3723695	708127	15-MAR-10 11:40:52AM	looks like old KF burrow -- single burrow with old KF scat present.	
Mammal Burrow	BMABH002	3724223	708228	15-MAR-10 9:35:42AM	Unknown burrow type. 1 hole, 200 mm wide, end not seen. Deteriorated.	
Mammal Burrow	BMACG022	3718424	703734	17-APR-10 10:03:58AM	Could be easily excavated by burrowing owl	

Map Label	IDENT	Y_PROJ	X_PROJ	Date	Notes	Class
Mammal Burrow	BMADT003	3724652	705973	17-MAR-10 10:50:04AM	Large opening in side of wash, shrinks to ~4x3 inches but end not seen. Soil moist. Too much veg cover for WBO.	
Mammal Burrow	BMAWV002	3724323	707766	18-MAR-10 1:24:21PM	Partially collapsed entrance remains accessible. 10" x 8". 2 tunnels branch after entrance.	
Mammal Burrow	BMAWV001	3723639	707920	18-MAR-10 9:04:55AM	7" x 5.5". End not visible. Not active, unknown origin.	
Mammal Burrow	BMABH003	3724205	707918	18-MAR-10 9:27:06AM	Origin unknown. 7" x" 4", 15" deep. Under galleta grass, not active.	
Mammal Burrow	BMARK002	3724199	707404	19-MAR-10 3:31:25PM	Collapsed, shallow spoils. 12" wide x 8" tall. 24" deep, potential DT origin, inconclusive.	
Mammal Burrow	BMARK001	3724198	707640	19-MAR-10 9:15:15AM	8" wide x 6" tall, 18" deep.	
Mammal Burrow	BMARK003	3724748	707220	20-MAR-10 2:16:39PM	10 x 8", 20" deep. Single opening in wash bank above BDBAD001	
Mammal Burrow	BMAWV005	3724602	707202	20-MAR-10 3:06:39PM	Single opening. Soil tunnel that is washed out. No animal sign.	
Mammal Burrow	BMABH005	3724966	707023	21-MAR-10 12:25:06PM	Single burrow in side of wash, inactive. Old KF scat at entrance.	
Mammal Burrow	BMADT004	3725002	706975	21-MAR-10 2:24:30PM	Single opening, 14 x 9", 30" deep. KF scat out front on top of wash bank.	
Mammal Burrow	BMABH006	3724753	706971	21-MAR-10 2:34:41PM	1 opening, 11 x 13", unk. Depth. Not active, prob. Badger	
Mammal Burrow	BMARK004	3723639	706933	21-MAR-10 3:25:39PM	2 openings, inactive mammal burrow. 14 x 12 x 36". Origin unk.	
Mammal Burrow	BMAMR012	3722508	708423	22-APR-10 10:05:32AM	Mammal burrow, probably badger foraging burrow, 8 x 4", 2 burrows	
Mammal Burrow	BMAMR013	3722430	708463	22-APR-10 10:55:45AM	Mammal burrow, potential badger foraging burrow, 8 x 4"	
Mammal Burrow	BMAAD006	3723158	708388	22-APR-10 5:40:04PM	Appears to be badger foraging burrow, 7 x 4"	
Mammal Burrow	BMARB001	3725107	708399	22-MAR-10 1:41:48PM	Burrow under rush milkweed. Relatively fresh canid digging, rodent droppings at entrance. ~15 cm wide	
Mammal Burrow	BMADT006	3724973	706638	22-MAR-10 10:18:06AM	Large mammal burrow, closes to 5 x 6. KF scat.	
Mammal Burrow	BMAMR001	3724173	706770	22-MAR-10 3:40:49PM	Burrow, 7", round, some weeds, but open	

Map Label	IDENT	Y_PROJ	X_PROJ	Date	Notes	Class
Mammal Burrow	BMAAD002	3724973	706797	22-MAR-10 5:03:38PM	5 entrances, south facing above wash in desert pavement	
Mammal Burrow	BMABH008	3725020	706928	23-MAR-10 1:49:34PM	Inactive (annual veg in entrance). Round burrow (poss badger).	
Mammal Burrow	BMAAD003	3724628	706857	23-MAR-10 11:12:59AM	Old burrow, not active (annual veg and erosion). Poss badger claw marks	
Mammal Burrow	BMARS001	3724752	706884	23-MAR-10 3:53:24PM	Single opening. 12" wide x 16". KF scat out front, old BUOW whitewash.	
Mammal Burrow	BMARS002	3724814	708591	24-MAR-10 11:14:58AM	Canid foraging dig. 9"x x 5", 11" deep. In a creosote bush. Not active.	
Mammal Burrow	BMABH009	3723666	708817	24-MAR-10 5:19:06PM	old inactive burrow in rocky cliff bend of incised wash. Origin unknown. 20" wide x 12", 12" deep.	
Mammal Burrow	BMARS003	3724081	708926	25-MAR-10 12:55:26PM	10" w x 5", 12" deep. Origin unk. Not active. Potential for tort use.	
Mammal Burrow	BMACG102	3721464	708295	26-APR-10 10:12:03AM	Cannot determine depth, 9" x 5", KF scat present (old), no signs of recent use	
Mammal Burrow	BMACG103	3722746	708266	26-APR-10 10:57:48AM	Mammal burrow, NW orientation, 2 m from caved in burrow, possibly kit fox, 9 x 12"	
Mammal Burrow	BMACG101	3722480	708583	26-APR-10 8:51:24AM	Mammal burrow, 9" x 9", western orientation, does not appear active, cannot see to end	
Mammal Burrow	BMARS005	3727495	708291	28-MAR-10 10:42:30AM	No recent sign of use, no claw marks or scat around.	
Mammal Burrow	BMAMR003	3728022	704902	29-MAR-10 10:24:19AM	6.5" wide x 7" tall, north-facing in bank of wash	
Mammal Burrow	BMAMR004	3728029	704966	29-MAR-10 10:27:19AM	7.5" x 5", partially collapsed, north-facing in bank of wash	
Mammal Burrow	BMASD003	3726661	711506	30-MAR-10 10:50:23AM	RTGS complex in berm, some burrows large enough for BUOW	
Mammal Burrow	BMASD002	3726898	712175	30-MAR-10 9:53:20AM	Potential BUOW burrow 6 x 6"	
Mammal Burrow	BMADT007	3726899	712150	30-MAR-10 9:59:59AM	Potential BUOW burrow 7 x 7" in side of berm	
Mammal Burrow	BMABH011	3727600	705302	31-MAR-10 1:15:40PM	10" x 7.5", unknown depth. Inactive. Canid dig.	
Mammal Burrow	BMABH012	3727646	705247	31-MAR-10 1:47:09PM	12" x 10.5", 22" deep. Not active. Rodent hole leaves form back (at 22").	

Map Label	IDENT	Y_PROJ	X_PROJ	Date	Notes	Class
Mammal Burrow	BMAGL002	3723416	705207	31-MAR-10 10:20:57AM	mammal burrow, potential for tort. Gray fox scat inside. 7" x 6", very deep.	
Mammal Burrow	BMABH013	3727799	705059	31-MAR-10 3:03:01PM	mammal, based on size and shape of spoil pile (long and narrow). Partially collapsed entrance. Inactive. 11" x 9", end unknown	
Mammal Burrow	BMABH010	3726577	711510	31-MAR-10 9:54:45AM	inactive burrow, could conceal DT, suit for BUOW. 11" x 6.5", 30" deep.	
Mammal Burrow	BMACG021	3719208	708688	Apr 17 2010	Not entered in GPS unit, under palo verde	
Mammal Burrow	BMACG020	3719212	708802	Apr 17 2010	Not entered in GPS unit, under bush	
Mammal Burrow	BMAMR015	3725947	704711	14-MAY-10 4:59:54PM	Kit fox/grey fox scat outside, under rock, tortoise may have used this, can't tell how deep, but 10" wide x 5" tall	
Mammal Burrow	BMAMR002	3727357	708638	27-MAR-10 12:30:19PM	mammal dig, could be used as pallet for DT but no evidence of use.	Y
Mammal Burrow	BMARS004	3727054	708616	27-MAR-10 12:38:43PM	7" x 5" in RTGS complex. Suit for BUOW, no sign.	
Mammal Burrow	BMASD001	3727009	708970	27-MAR-10 8:47:53AM	10" x 6" mammal burrow. Potential for BUOW, no sign.	
Mammal Burrow	BMAMR014	3722879	707521	14-MAY-10 9:44:23AM	Two 6" x 6" holes, converge together, not currently used, under creosote in wash face	
Mammal Burrow with Burrowing Owl Sign	BMACG005	3725473	705898	05-APR-10 11:33:52AM	Rock crevasse, large opening but narrows to ~6 x 8 in. Some veg in entrance. Some whitewash, but may not be WBO. End not seen.	
Mammal Burrow/Badger Sign	BMAMR009	3724447	710779	07-APR-10 8:13:00AM	Badger foraging burrow, somewhat deteriorated, ends after ~ 18 in.	
Mammal Burrow/Badger Sign	BMABH004	3724307	707794	18-MAR-10 1:26:43PM	10" x 11". Unknown end, prob. Badger created, inactive	
Mammal Burrow/Badger Sign	BMAAD005	3722311	708433	22-APR-10 9:51:41AM	Mammal burrow, probably badger foraging burrowing, 10 x 8"	
Mammal Burrow/Badger Sign	BMAAD007	3722604	708270	14-MAY-10 9:30:14AM	May be badger foraging burrow	
Mojave Fringe-toed Lizard	BMFBH004	3719319	702817	02-APR-10 1:01:40PM	Adult	
Mojave Fringe-toed Lizard	BMFBH005	3719322	702990	02-APR-10 1:07:30PM	Subadult	
Mojave Fringe-toed Lizard	BMFDT007	3717485	700824	02-APR-10 1:08:49PM	Subadult	

Map Label	IDENT	Y_PROJ	X_PROJ	Date	Notes	Class
Mojave Fringe-toed Lizard	BMFDT008	3716996	701588	02-APR-10 1:42:56PM	Adult	
Mojave Fringe-toed Lizard	BMFRK001	3719444	702043	02-APR-10 10:29:08AM	Adult	
Mojave Fringe-toed Lizard	BMFRK002	3719451	702459	02-APR-10 10:39:14AM	Subadult	
Mojave Fringe-toed Lizard	BMFMR002	3719451	702653	02-APR-10 10:43:40AM	Adult	
Mojave Fringe-toed Lizard	BMFMR003	3719456	702794	02-APR-10 10:49:03AM	Two adults, 1 subadult	
Mojave Fringe-toed Lizard	BMFMR004	3719413	702887	02-APR-10 11:16:39AM	Subadult	
Mojave Fringe-toed Lizard	BMFMJR001	3718236	700885	02-APR-10 11:30:43AM	Two subadults	
Mojave Fringe-toed Lizard	BMFDT002	3719292	700412	02-APR-10 11:33:53AM	Subadult	
Mojave Fringe-toed Lizard	BMFMA001	3718254	700886	02-APR-10 11:34:35AM	Three subadults	
Mojave Fringe-toed Lizard	BMFMR005	3719413	702061	02-APR-10 11:38:20AM	Adult	
Mojave Fringe-toed Lizard	BMFMJR002	3718405	700848	02-APR-10 11:44:16AM	1 adult, 1 subadult	
Mojave Fringe-toed Lizard	BMFMR006	3719397	702344	02-APR-10 11:49:31AM	Subadult	
Mojave Fringe-toed Lizard	BMFDT003	3718735	700426	02-APR-10 11:51:10AM	Adult	
Mojave Fringe-toed Lizard	BMFDT004	3718633	700436	02-APR-10 11:56:12AM	Subadult	
Mojave Fringe-toed Lizard	BMFMA002	3719126	700853	02-APR-10 12:10:48PM	1 adult, 1 subadult	
Mojave Fringe-toed Lizard	BMFCG001	3718253	700471	02-APR-10 12:12:29PM	Subadult	
Mojave Fringe-toed Lizard	BMFMA003	3719163	700831	02-APR-10 12:15:42PM	Adult	
Mojave Fringe-toed Lizard	BMFCG002	3718137	700480	02-APR-10 12:18:06PM	Subadult	

Map Label	IDENT	Y_PROJ	X_PROJ	Date	Notes	Class
Mojave Fringe-toed Lizard	BMFMR007	3719355	703006	02-APR-10 12:18:49PM	Subadult	
Mojave Fringe-toed Lizard	BMFMJR003	3719275	700817	02-APR-10 12:19:44PM	Juvenile	
Mojave Fringe-toed Lizard	BMFDT005	3718067	700510	02-APR-10 12:21:56PM	Subadult	
Mojave Fringe-toed Lizard	BMFDT006	3717979	700547	02-APR-10 12:28:07PM	Subadult	
Mojave Fringe-toed Lizard	BMFMA004	3719522	700838	02-APR-10 12:29:15PM	Adult	
Mojave Fringe-toed Lizard	BMFCG003	3717842	700585	02-APR-10 12:37:15PM	Subadult	
Mojave Fringe-toed Lizard	BMFCG004	3716912	702960	02-APR-10 2:27:07PM	Adult	
Mojave Fringe-toed Lizard	BMFCG005	3716901	703003	02-APR-10 2:31:58PM	Adult	
Mojave Fringe-toed Lizard	BMFCG006	3719399	704609	02-APR-10 4:12:40PM	Subadult	
Mojave Fringe-toed Lizard	BMFRK003	3718558	702084	02-APR-10 5:52:21PM	Subadult	
Mojave Fringe-toed Lizard	BMFMR001	3719521	702669	02-APR-10 9:54:18AM	Adult	
Mojave Fringe-toed Lizard	BMFBH009	3719242	702175	03-APR-10 1:44:51PM	1 adult	
Mojave Fringe-toed Lizard	BMFMA008	3719240	702316	03-APR-10 1:49:33PM	1 subadult	
Mojave Fringe-toed Lizard	BMFMJR008	3718650	702636	03-APR-10 1:57:40PM	1 subadult	
Mojave Fringe-toed Lizard	BMFDT011	3718411	702553	03-APR-10 10:08:52AM	1 adult	
Mojave Fringe-toed Lizard	BMFMJR005	3718386	702445	03-APR-10 10:11:53AM	1 subadult	
Mojave Fringe-toed Lizard	BMFRK004	3718475	702308	03-APR-10 10:14:42AM	1 subadult	
Mojave Fringe-toed Lizard	BMFRK005	3718552	702003	03-APR-10 10:43:53AM	1 subadult	

Map Label	IDENT	Y_PROJ	X_PROJ	Date	Notes	Class
Mojave Fringe-toed Lizard	BMFMJR006	3718950	702170	03-APR-10 11:20:58AM	1 subadult	
Mojave Fringe-toed Lizard	BMFDT012	3718601	702210	03-APR-10 11:35:51AM	1 subadult	
Mojave Fringe-toed Lizard	BMFCG009	3718560	702200	03-APR-10 11:37:49AM	1 subadult	
Mojave Fringe-toed Lizard	BMFMA005	3719301	702981	03-APR-10 11:50:22AM	3 adults	
Mojave Fringe-toed Lizard	BMFCG010	3718727	702261	03-APR-10 12:01:27PM	1 adult	
Mojave Fringe-toed Lizard	BMFMA006	3719267	702857	03-APR-10 12:02:22PM	1 subadult	
Mojave Fringe-toed Lizard	BMFCG011	3718631	702307	03-APR-10 12:13:53PM	1 adult	
Mojave Fringe-toed Lizard	BMFCG012	3718781	702311	03-APR-10 12:20:24PM	1 adult	
Mojave Fringe-toed Lizard	BMFBH008	3719198	702150	03-APR-10 12:22:11PM	1 subadult	
Mojave Fringe-toed Lizard	BMFMA007	3719069	702145	03-APR-10 12:26:26PM	1 adult, 1 subadult	
Mojave Fringe-toed Lizard	BMFCG013	3718863	702328	03-APR-10 12:34:38PM	1 subadult	
Mojave Fringe-toed Lizard	BMFDT013	3718603	702330	03-APR-10 12:42:00PM	1 subadult	
Mojave Fringe-toed Lizard	BMFMJR007	3718568	702341	03-APR-10 12:43:56PM	1 subadult	
Mojave Fringe-toed Lizard	BMFCG014	3718615	702368	03-APR-10 12:55:51PM	1 subadult	
Mojave Fringe-toed Lizard	BMFBH010	3719243	702870	03-APR-10 2:01:36PM	2 lizards: 1 adult, 1 subadult	
Mojave Fringe-toed Lizard	BMFMJR009	3718639	702797	03-APR-10 2:18:08PM	1 subadult	
Mojave Fringe-toed Lizard	BMFMA009	3719204	702876	03-APR-10 2:20:49PM	2 lizards: both subadults	
Mojave Fringe-toed Lizard	BMFMJR010	3718642	702684	03-APR-10 2:21:50PM	1 adult	

Map Label	IDENT	Y_PROJ	X_PROJ	Date	Notes	Class
Mojave Fringe-toed Lizard	BMFCG015	3718622	702550	03-APR-10 2:26:15PM	1 adult	
Mojave Fringe-toed Lizard	BMFMA010	3719216	702416	03-APR-10 2:30:25PM	2 subadults	
Mojave Fringe-toed Lizard	BMFBH011	3719175	702610	03-APR-10 2:49:26PM	1 subadult	
Mojave Fringe-toed Lizard	BMFCG016	3718561	702995	03-APR-10 2:49:58PM	1 subadult	
Mojave Fringe-toed Lizard	BMFCG017	3718560	702960	03-APR-10 2:54:10PM	1 subadult	
Mojave Fringe-toed Lizard	BMFMA011	3719173	703022	03-APR-10 2:58:41PM	2 subadults	
Mojave Fringe-toed Lizard	BMFMJR011	3718578	702587	03-APR-10 3:03:51PM	1 subadult	
Mojave Fringe-toed Lizard	BMFDT014	3718563	702428	03-APR-10 3:08:59PM	1 subadult	
Mojave Fringe-toed Lizard	BMACG018	3718550	702962	03-APR-10 3:25:19PM	1 subadult	
Mojave Fringe-toed Lizard	BMFMJR012	3718716	703009	03-APR-10 3:42:22PM	1 subadult	
Mojave Fringe-toed Lizard	BMFMJR013	3718887	703010	03-APR-10 3:47:01PM	1 adult	
Mojave Fringe-toed Lizard	BMFMJR014	3718892	702964	03-APR-10 3:54:35PM	1 subadult	
Mojave Fringe-toed Lizard	BMFMJR015	3718699	702962	03-APR-10 3:59:27PM	1 subadult	
Mojave Fringe-toed Lizard	BMACG019	3718667	702931	03-APR-10 4:02:23PM	1 subadult	
Mojave Fringe-toed Lizard	BMFMJR016	3718912	702951	03-APR-10 4:08:53PM	1 subadult	
Mojave Fringe-toed Lizard	BMFDT015	3718818	702917	03-APR-10 4:17:41PM	1 subadult	
Mojave Fringe-toed Lizard	BMFMJR017	3718702	702888	03-APR-10 4:25:07PM	1 subadult	
Mojave Fringe-toed Lizard	BMFDT016	3718801	702883	03-APR-10 4:27:43PM	1 subadult	

Map Label	IDENT	Y_PROJ	X_PROJ	Date	Notes	Class
Mojave Fringe-toed Lizard	BMFDT009	3718744	701929	03-APR-10 8:40:39AM	1 adult	
Mojave Fringe-toed Lizard	BMFBH006	3719392	702002	03-APR-10 8:55:33AM	1 adult	
Mojave Fringe-toed Lizard	BMFBH007	3719552	702137	03-APR-10 9:02:53AM	1 adult	
Mojave Fringe-toed Lizard	BMFCG007	3719528	702216	03-APR-10 9:06:26AM	1 subadult	
Mojave Fringe-toed Lizard	BMFCG008	3719540	702795	03-APR-10 9:25:16AM	1 subadult	
Mojave Fringe-toed Lizard	BMFDT010	3719363	703125	03-APR-10 9:32:42AM	1 subadult	
Mojave Fringe-toed Lizard	BMFMJR004	3719330	703157	03-APR-10 9:33:28AM	1 subadult	
Mojave Fringe-toed Lizard	BMFMA012	3719088	703012	04-APR-10 9:04:53AM	1 subadult	
Mojave Fringe-toed Lizard	BMFDT019	3718708	704035	12-APR-10 1:11:55PM	1 subadult.	
Mojave Fringe-toed Lizard	BMFDT020	3718708	704072	12-APR-10 1:13:41PM	1 subadult.	
Mojave Fringe-toed Lizard	BMFCG023	3718744	704845	12-APR-10 1:36:02PM	1 subadult.	
Mojave Fringe-toed Lizard	BMFBH012	3718756	704879	12-APR-10 1:37:45PM	1 adult.	
Mojave Fringe-toed Lizard	BMFMR009	3718722	704901	12-APR-10 1:39:14PM	1 adult.	
Mojave Fringe-toed Lizard	BMFMR010	3718720	704957	12-APR-10 1:41:22PM	1 subadult.	
Mojave Fringe-toed Lizard	BMFDT021	3718733	704990	12-APR-10 1:42:42PM	1 adult.	
Mojave Fringe-toed Lizard	BMFCG024	3718744	705023	12-APR-10 1:44:53PM	1 subadult.	
Mojave Fringe-toed Lizard	BMFRB002	3718768	704438	12-APR-10 11:14:27AM	1 subadult, took shelter under creosote bush.	
Mojave Fringe-toed Lizard	BMFCG020	3718763	703724	12-APR-10 11:38:38AM	1 subadult.	

Map Label	IDENT	Y_PROJ	X_PROJ	Date	Notes	Class
Mojave Fringe-toed Lizard	BMFMR008	3718677	703161	12-APR-10 12:45:08PM	1 adult.	
Mojave Fringe-toed Lizard	BMFCG021	3718706	703421	12-APR-10 12:50:34PM	1 subadult.	
Mojave Fringe-toed Lizard	BMFCG022	3718704	703723	12-APR-10 12:57:57PM	1 adult.	
Mojave Fringe-toed Lizard	BMFRB003	3718757	705109	12-APR-10 2:01:47PM	1 subadult.	
Mojave Fringe-toed Lizard	BMFRB004	3718803	707147	12-APR-10 2:48:57PM	1 subadult.	
Mojave Fringe-toed Lizard	BMFCG025	3718723	707621	12-APR-10 3:00:22PM	1 adult.	
Mojave Fringe-toed Lizard	BMFRB005	3718724	707997	12-APR-10 3:08:52PM	1 subadult.	
Mojave Fringe-toed Lizard	BMFBH014	3719488	708551	12-APR-10 3:31:30PM	1 adult.	
Mojave Fringe-toed Lizard	BMFRB006	3719540	708556	12-APR-10 3:33:41PM	2 adults, 1 subadult, + 2 adults ~ 10 m. north.	
Mojave Fringe-toed Lizard	BMFDT017	3718853	707355	12-APR-10 9:29:24AM	1 subadult.	
Mojave Fringe-toed Lizard	BMFRB001	3718831	707122	12-APR-10 9:41:28AM	1 subadult, ran into burrow.	
Mojave Fringe-toed Lizard	BMFDT018	3718844	706898	12-APR-10 9:48:27AM	1 subadult.	
Mojave Fringe-toed Lizard	BMFKF001	3718628	707957	13-APR-10 12:10:04PM	1 adult.	
Mojave Fringe-toed Lizard	BMFMR012	3718735	707411	13-APR-10 12:23:49PM	1 adult in sand hummocks.	
Mojave Fringe-toed Lizard	BMFMR011	3718874	708000	13-APR-10 9:32:34AM	1 subadult.	
Mojave Fringe-toed Lizard	BMFAD001	3719374	703576	14-MAR-10 1:17:56PM	Subadult MFTL	
Mojave Fringe-toed Lizard	BMFGL001	3719022	703468	14-MAR-10 1:26:14PM	Subadult MFTL	
Mojave Fringe-toed Lizard	BMFAD002	3719084	703057	14-MAR-10 1:37:19PM	Adult MFTL	

Map Label	IDENT	Y_PROJ	X_PROJ	Date	Notes	Class
Mojave Fringe-toed Lizard	BMFBH001	3718944	702895	14-MAR-10 1:48:24PM	One adult MFTL, running across sand	
Mojave Fringe-toed Lizard	BMFEG001	3718857	703012	14-MAR-10 1:49:09PM	Adult MFTL	
Mojave Fringe-toed Lizard	BMFEG002	3718774	703008	14-MAR-10 1:53:27PM	Subadult MFTL	
Mojave Fringe-toed Lizard	BMFBH002	3718829	702905	14-MAR-10 1:54:00PM	One adult MFTL, running across sand	
Mojave Fringe-toed Lizard	BMFEG003	3718661	703018	14-MAR-10 1:58:45PM	Adult MFTL	
Mojave Fringe-toed Lizard	BMFGL002	3718514	702943	14-MAR-10 2:12:02PM	MFTL, subadult	
Mojave Fringe-toed Lizard	BMFAD003	3718616	702796	14-MAR-10 2:21:48PM	MFTL, subadult	
Mojave Fringe-toed Lizard	BMFGL003	3718664	702761	14-MAR-10 2:25:15PM	MFTL, subadult	
Mojave Fringe-toed Lizard	BMFBH003	3718983	702599	14-MAR-10 2:54:19PM	One subadult MFTL	
Mojave Fringe-toed Lizard	BMFAD004	3718734	702654	14-MAR-10 3:00:14PM	MFTL, adult	
Mojave Fringe-toed Lizard	BMFGL004	3718664	702681	14-MAR-10 3:02:56PM	subadult MFTL	
Mojave Fringe-toed Lizard	BMFAD005	3718658	702507	14-MAR-10 3:36:36PM	subadult MFTL	
Mojave Fringe-toed Lizard	BMFDT001	3718599	702539	14-MAR-10 3:38:45PM	One subadult MFTL, missing tail	
Mojave Fringe-toed Lizard	BMFCG026	3718412	703133	17-APR-10 10:15:54AM	Subadult	
Mojave Fringe-toed Lizard	BMFRB007	3718436	703093	17-APR-10 10:22:02AM	2 adults	
Mojave Fringe-toed Lizard	BMFRB008	3718404	702959	17-APR-10 10:26:47AM	Adult	
Mojave Fringe-toed Lizard	BMFCG027	3718421	702808	17-APR-10 10:30:37AM	Subadult	
Mojave Fringe-toed Lizard	BMFRB009	3718824	702578	17-APR-10 11:08:57AM	Subadult	

Map Label	IDENT	Y_PROJ	X_PROJ	Date	Notes	Class
Mojave Fringe-toed Lizard	BMFCG028	3719088	702773	17-APR-10 11:16:32AM	Subadult	
Mojave Fringe-toed Lizard	BMFRB010	3719110	703167	17-APR-10 11:24:07AM	Subadult	
Mojave Fringe-toed Lizard	BMFCG029	3719122	703333	17-APR-10 11:28:17AM	Adult	
Mojave Fringe-toed Lizard	BMFCG030	3719115	703453	17-APR-10 11:31:03AM	Subadult	
Mojave Fringe-toed Lizard	BMFRB011	3719126	703930	17-APR-10 11:39:08AM	Subadult	
Mojave Fringe-toed Lizard	BMFCG031	3719143	704295	17-APR-10 11:45:53AM	Subadult	
Mojave Fringe-toed Lizard	BMFCG032	3719144	704686	17-APR-10 11:53:36AM	Subadult	
Mojave Fringe-toed Lizard	BMFCG033	3719143	704885	17-APR-10 11:57:38AM	Subadult	
Mojave Fringe-toed Lizard	BMFCG034	3719173	705785	17-APR-10 12:13:07PM	Adult	
Mojave Fringe-toed Lizard	BMFCG035	3719180	706236	17-APR-10 12:23:19PM	Subadult	
Mojave Fringe-toed Lizard	BMFCG036	3719183	706292	17-APR-10 12:25:47PM	Subadult	
Mojave Fringe-toed Lizard	BMFCG101	3718967	703688	24-APR-10 1:41:26PM	subadult	
Mojave Fringe-toed Lizard	BMFCG102	3718974	703970	24-APR-10 1:48:19PM	subadult	
Mojave Fringe-toed Lizard	BMFCG103	3719047	707062	24-APR-10 2:58:21PM	subadult	
Mojave Fringe-toed Lizard	BMFMR011	3719023	707074	24-APR-10 3:02:17PM	adult	
Mojave Fringe-toed Lizard	BMFMR012	3719006	706468	24-APR-10 3:03:55PM	adult	
Mojave Fringe-toed Lizard	BMFCG104	3718908	704901	24-APR-10 4:08:26PM	subadult	
Mojave Fringe-toed Lizard	BMFCG105	3718863	702947	24-APR-10 4:53:30PM	subadult	

Map Label	IDENT	Y_PROJ	X_PROJ	Date	Notes	Class
Mojave Fringe-toed Lizard	BMFMR013	3718926	704755	24-APR-10 5:11:24PM	adult	
Mojave Fringe-toed Lizard	BMFMR014	3718898	703327	24-APR-10 5:14:20PM	adult	
Mojave Fringe-toed Lizard	BMFCG114	3718655	707199	25-APR-10 1:44:57PM	subadult	
Mojave Fringe-toed Lizard	BMFCG106	3718758	706306	25-APR-10 10:10:23AM	subadult	
Mojave Fringe-toed Lizard	BMFCG107	3718737	705390	25-APR-10 10:30:03AM	subadult	
Mojave Fringe-toed Lizard	BMFCG108	3718713	704612	25-APR-10 10:44:52AM	subadult	
Mojave Fringe-toed Lizard	BMFCG109	3718711	704582	25-APR-10 10:46:01AM	subadult	
Mojave Fringe-toed Lizard	BMFCG110	3718705	704530	25-APR-10 10:47:47AM	subadult	
Mojave Fringe-toed Lizard	BMFCG111	3718706	704064	25-APR-10 10:57:53AM	subadult	
Mojave Fringe-toed Lizard	BMFMR100	3718903	706171	25-APR-10 11:40:54AM	adult	
Mojave Fringe-toed Lizard	BMFMR101	3718833	703165	25-APR-10 11:42:16AM	subadult	
Mojave Fringe-toed Lizard	BMFMR102	3718843	703140	25-APR-10 11:43:25AM	adult	
Mojave Fringe-toed Lizard	BMFCG112	3718626	703164	25-APR-10 12:21:36PM	subadult	
Mojave Fringe-toed Lizard	BMFCG113	3718645	704051	25-APR-10 12:38:11PM	subadult	
Nest	BNEMJR001	3718555	700834	02-APR-10 11:51:08AM	Prob raptor, at top of powerline structure	
Nest	BNEDT001	3722937	705232	06-APR-10 12:11:34PM	Black-throated sparrow nest in small bush in wash. Flushed adult from nest, 4 eggs.	
Nest - Lesser nighthawk	BNECG101	3721865	708606	26-APR-10 9:18:31AM	Lesser nighthawk nest, under creosote, next to trash pile, 2 eggs, east side	
Northern Harrier	BNHMJR001	3719872	704166	02-APR-10 8:45:42AM	300 meters south of location	

Map Label	IDENT	Y_PROJ	X_PROJ	Date	Notes	Class
Northern Harrier	BNHMR001	3724468	714804	08-APR-10 7:48:14AM	Off site. Male flying low across road.	
Northern Harrier	BNHBH001	3718758	705141	12-APR-10 2:04:56PM	1 northern harrier soaring in migration with a mixed flock of turkey vultures, red-tailed hawk, and Swainson's hawks (2).	
Northern Harrier	BNHDT001	3724645	707092	21-MAR-10 10:06:15AM	1 female in flight, headed west	
Owl (not Burrowing) Pellets	BOORS001	3723722	708727	24-MAR-10 3:23:35PM	2 great-horned owl pellets plus scat under ironwood snag.	
Ponded Area	BOODT003	3717612	700711	02-APR-10 1:03:27PM	More dry ponds, many "ponds" in area	
Ponded Area	BOODT002	3717773	700646	02-APR-10 12:45:39PM	75m x 50 m obvious ponding. Potential for spadefoot	
Ponded Area	BOODT004	3722028	709462	06-APR-10 4:31:42PM	Large area of baked earth at base of artificial berm, potential for spadefoot.	
Ponded Area	BOOBH005	3721254	709351	07-APR-10 10:16:59AM	Areas parallel to I-10, along the gravel frontage road, within or adjacent to the proposed utility corridor, where there are signs of ponding or pools of water that could have lasted for seven or more days. Areas with this sign were intermittent along the gravel frontage road (just north of the frontage road), including more than just the points listed here. Of these points, BOOBH005 was the largest and had the most potential for holding water over a long period of time.	
Ponded Area	BOOMR001	3727727	712708	07-APR-10 4:50:27PM	Basin formed by road berm, evidence of ponding, potential for spadefoot.	
Ponded Area	BOOMR002	3727746	713036	07-APR-10 5:01:21PM	Basin formed by road berm, evidence of ponding, some tamarisk, potential for spadefoot.	

Map Label	IDENT	Y_PROJ	X_PROJ	Date	Notes	Class
Ponded Area	BOOBH002	3721221	710612	07-APR-10 8:12:24AM	Areas parallel to I-10, along the gravel frontage road, within or adjacent to the proposed utility corridor, where there are signs of ponding or pools of water that could have lasted for seven or more days. Areas with this sign were intermittent along the gravel frontage road (just north of the frontage road), including more than just the points listed here. Of these points, BOOBH005 was the largest and had the most potential for holding water over a long period of time.	
Ponded Area	BOOBH003	3721209	710122	07-APR-10 8:38:28AM	Areas parallel to I-10, along the gravel frontage road, within or adjacent to the proposed utility corridor, where there are signs of ponding or pools of water that could have lasted for seven or more days. Areas with this sign were intermittent along the gravel frontage road (just north of the frontage road), including more than just the points listed here. Of these points, BOOBH005 was the largest and had the most potential for holding water over a long period of time.	
Ponded Area	BOOBH004	3721200	709944	07-APR-10 8:47:06AM	Areas parallel to I-10, along the gravel frontage road, within or adjacent to the proposed utility corridor, where there are signs of ponding or pools of water that could have lasted for seven or more days. Areas with this sign were intermittent along the gravel frontage road (just north of the frontage road), including more than just the points listed here. Of these points, BOOBH005 was the largest and had the most potential for holding water over a long period of time.	
Ponded Area	BPOOLAD001	3725135	705827	10-MAR-10 4:52:07PM	Potential spadefoot breeding pool. 15' x 3' X 10"	
Ponded Area	BOOMR003	3719028	708265	12-APR-10 8:49:25AM	Hard pan bottomed depression, some evidence of ponding, ~10 x 5 m., potential for spadefoot.	
Ponded Area	BOOSD001	3725377	706217	19-MAR-10 12:07:40PM	Within drainage, evidence (picture) of pooling water in season. Potential pool site for couch's spadefoot.	
Ponded Area	BOOSD002	3725168	706270	20-MAR-10 9:41:38AM	Pool. Evidence of ponding, clay in soils. Might support couch's spadefoot.	

Map Label	IDENT	Y_PROJ	X_PROJ	Date	Notes	Class
Ponded Area	BOOAD001	3721442	708432	22-APR-10 9:16:44AM	Couch's spadefoot toad potential breeding pool, 6 x 4 m, ? Feeds into pond, currently dry, pond about 2' deep	
Ponded Area	BOOAD002	3721949	708429	22-APR-10 9:35:45AM	Potential breeding pool for Couch's spadefoot toad, 50 x 5 x 1 m	
Ponded Area	BOOMR100	3719031	708073	25-APR-10 9:36:00AM	Long trench, 20 to 30 feet wide, 2' deep, potential for Couch's spadefoot toad, probably extends to levee near solar plant in SE	
Ponded Area	BOOMR101	3721394	708283	26-APR-10 10:03:56AM	Evidence of pond, up to 2 feet of water for Couch's spadefoot. 12' x 12', milkweed present	
Ponded Area	BOODT001	3727064	712700	31-MAR-10 8:23:17AM	depression in old ag field, evidence of ponding, potential for spadefoot	
Potential Bat Guano at Burrow	BMABH007	3725017	706939	21-MAR-10 4:03:24PM	10 x 7". Unk. Depth. Burrow in incised wash bank. Looks like bat guano (?) in entrance.	
Swainson's Hawk	BSWBH001	3719472	702790	02-APR-10 10:51:35AM	1 Swainson's hawk, soaring, gliding, heading N/NW	
Swainson's Hawk	BSWBH002	3719391	702715	02-APR-10 11:59:56AM	1 adult dark morph, soaring and gliding, heading NW. 3 light morph birds, 5 minutes later, soaring ~100 feet off the ground. Apparently hunting during migration (1200- 1215)	
Swainson's Hawk	BSWDT001	3719005	704615	02-APR-10 3:59:36PM	3 soaring, moving generally west.	
Swainson's Hawk	BSHMJR001	3719667	702934	03-APR-10 9:20:04AM	3 Swainson's hawks soaring overhead, heading generally west	
Swainson's Hawk	BSWMR002	3725823	712447	07-APR-10 9:16:20AM	8 individuals soaring overhead, flying generally west.	
Swainson's Hawk	BSWBH003	3718792	705900	12-APR-10 10:28:44AM	~40 individuals perched in creosote, took flight when we approached, soared overhead. 50 more individuals observed later. Birds perched on ground and in creosote. Looks like they were feeding on sphinx moth larvae that were numerous in this area.	
Swainson's Hawk	PSHCG001	3718950	708246	12-APR-10 8:55:15AM	1 individual, soaring, moving west.	
Swainson's Hawk	BSWMR003	3718842	708059	13-APR-10 8:50:29AM	A pair circling overhead.	
Swainson's Hawk	BSWMR001	3726910	711858	30-MAR-10 10:11:05AM	Swainson's hawk, near agricultural areas, 100 m to south of this point. Pair.	

Map Label	IDENT	Y_PROJ	X_PROJ	Date	Notes	Class
Tortoise Bone Fragment - Mineralized	BDCAD18	3725563	709437	02-APR-10 10:03:49AM	1x1", mineralized, possible fossil. Adult.	5
Tortoise Bone Fragment - Mineralized	BDCAD017	3725568	709515	02-APR-10 9:56:56AM	1"x1/4", mineralized	5
Tortoise Bone Fragment - Mineralized	BDCCG003	3726083	707721	05-APR-10 10:03:38AM	Very old (beginning to mineralize) tortoise scapula bone fragment. 2cm. X 1 cm.	5
Tortoise Bone Fragment - Mineralized	BDCCG004	3719625	708569	12-APR-10 3:38:33PM	Mineralized bone fragment, 3/4 x 1/2 inch, growth line visible.	5
Tortoise Bone Fragment - Mineralized	BDCRB004	3719849	708197	17-APR-10 1:25:43PM	1 cm x 1 cm, with scute line, mineralized	5
Tortoise Bone Fragment - Mineralized	BDCCG005	3719910	708198	17-APR-10 1:30:41PM	2 cm x 4 cm, marginal, mostly mineralized	5
Tortoise Bone Fragment - Mineralized	BDCRB005	3720693	708763	17-APR-10 1:54:17PM	2.5 cm x 2.5 cm, triangular mineralized marginal	5
Tortoise Bone Fragment - Mineralized	BDCGL004	3724845	705996	17-MAR-10 11:58:20AM	3 small pieces of tortoise bone, completely mineralized. Definitely tortoise, suture lines. Very old. Photos 1-4.	5
Tortoise Bone Fragment - Mineralized	BDCGL005	3724656	706181	17-MAR-10 3:19:14PM	1 piece of tortoise bone, from adult. Slightly mineralized. Suture mark.	5
Tortoise Bone Fragment - Mineralized	BDCSD002	3725117	706228	19-MAR-10 12:27:51PM	One piece of DT bone fragment, beginning to mineralize. 3/4" x 1/2".	5
Tortoise Bone Fragment - Mineralized	BDCSD004	3724829	706276	20-MAR-10 10:10:18AM	Tortoise bone fragment, starting to mineralized. Marginal. Adult, from plastron.	5
Tortoise Bone Fragment - Mineralized	BDCSD003	3725168	706270	20-MAR-10 9:38:30AM	Marginal tortoise bone fragment. Mineralized.	5
Tortoise Bone Fragment - Mineralized	BDCGL013	3725046	708489	23-MAR-10 2:57:18PM	1 adult DT bone. Marginal, likely gular from adult female. 3/4" x 1/2". Slightly mineralized.	5
Tortoise Bone Fragment - Mineralized	BDCAD009	3724099	708602	24-MAR-10 10:47:14AM	1 x 1.5" cm shell fragment, mineralized	5
Tortoise Bone Fragment - Mineralized	BDCRS001	3724368	708514	24-MAR-10 8:50:40AM	1 very old piece of mineralized plastron dermal bone. 2.5 x 3"	5
Tortoise Bone Fragment - Mineralized	BDCAD007	3724461	708520	24-MAR-10 9:03:33AM	1.5 x 2.5 plastron fragment, mineralized	5
Tortoise Bone Fragment - Mineralized	BDCCG101	3718624	705973	25-APR-10 2:07:32PM	Tortoise bone fragment, 1" x 1", plastron, partially mineralized, with scute	5
Tortoise Bone Fragment - Mineralized	BDCCG102	3718622	705853	25-APR-10 2:16:07PM	Tortoise bone fragment, 3/4" x 1 1/2", plastron, fully mineralized, probably larger tortoise than BDCCD101	5

Map Label	IDENT	Y_PROJ	X_PROJ	Date	Notes	Class
Tortoise Bone Fragment - Mineralized	BDCGL016	3725127	708943	25-MAR-10 12:16:56PM	1" x 0.5" mineralized shell fragment, likely from plastron.	5
Tortoise Bone Fragment - Mineralized	BDCMR005	3727182	708753	27-MAR-10 10:29:49AM	mineralized tort bone fragment, 1" x 1/2"	5
Tortoise Bone Fragment - Mineralized	BDCGL017	3727527	708789	27-MAR-10 10:40:10AM	mineralized tort bone fragment, 1/2" x 1/4"	5
Tortoise Bone Fragment - Mineralized	BDCSD005	3727562	708772	27-MAR-10 10:43:07AM	Vertebrae, starting to mineralize	
Tortoise Bone Fragment - Mineralized	BDCGL018	3727320	708692	27-MAR-10 12:07:39PM	Mineralized DT bone, 1/4' x 1/4"	5
Tortoise Bone Fragment - Mineralized	BDCGL021	3727718	705498	29-MAR-10 12:27:43PM	mineralized DT bone, 1 1/2" x 1'	5
Tortoise Bone Fragment - Mineralized	BDCGL022	3727730	705362	29-MAR-10 3:11:14PM	6 pieces of old tortoise bone, mineralized.	5
Tortoise Bone Fragment - Mineralized	BDCAD012	3722085	706390	30-MAR-10 11:33:36AM	1 tortoise bone, not mineralized. 1 x 1.5 cm.	5
Tortoise Bone Fragment - Mineralized	BDCGL026	3723935	708476	14-MAY-10 10:08:53AM	One piece of tortoise bone, marginal, arm or leg socket bone piece, mineralized, next to trash dump with cans and broken grass on desert pavement, 2" x 1"	5
Tortoise Bone Fragment - Not Mineralized	BDCBH006	3727037	705889	01-APR-10 10:50:21AM	1.75" x 1" piece of fractured DT bone. Time since death > 4 years but still recent (not mineralized). Scute seam obvious. In small wash.	
Tortoise Bone Fragment - Not Mineralized	BDCAD014	3726946	705921	01-APR-10 10:57:54AM	Approx. 12 pieces, adult, appears to be female. Found in cobble wash near ironwood	5
Tortoise Bone Fragment - Not Mineralized	BDCAD015	3727253	705599	01-APR-10 12:22:05PM	2 DT limb bones, disarticulated in wash.	5
Tortoise Bone Fragment - Not Mineralized	BDCAD016	3726352	705911	01-APR-10 2:39:14PM	14 pieces from adult DT all less than 1". Between desert pavement and wash.	5
Tortoise Bone Fragment - Not Mineralized	BDCMR012	3727236	705620	01-APR-10 8:49:49AM	5 pieces, non-mineralized, parts of plastron, 3x4 cm	5

Map Label	IDENT	Y_PROJ	X_PROJ	Date	Notes	Class
Tortoise Bone Fragment - Not Mineralized	BDCMJR001	3720601	703592	02-APR-10 1:46:15PM	2x1 cm bone fragment in wash	5
Tortoise Bone Fragment - Not Mineralized	BDCAD019	3725570	709046	02-APR-10 10:19:22AM	1/4" x 1/4", not mineralized	5
Tortoise Bone Fragment - Not Mineralized	BDCSD009	3725576	708785	02-APR-10 10:27:27AM	1/2" x 1/2", not mineralized	
Tortoise Bone Fragment - Not Mineralized	BDCAD020	3725567	708515	02-APR-10 10:35:51AM	3/4" x 1/2", not mineralized	5
Tortoise Bone Fragment - Not Mineralized	BDCDT003	3717777	700644	02-APR-10 12:41:20PM	1x1 cm	5
Tortoise Bone Fragment - Not Mineralized	BDCCG002	3717765	700650	02-APR-10 12:48:44PM	1x2 cm fragment	5
Tortoise Bone Fragment - Not Mineralized	BDCDT004	3717744	700652	02-APR-10 12:57:11PM	Scattered throughout ponding area	5
Tortoise Bone Fragment - Not Mineralized	BDCCG001	3720990	702479	02-APR-10 9:42:11AM	3x2 cm. Some scute lines. Old.	5
Tortoise Bone Fragment - Not Mineralized	BDCSD008	3725574	709583	02-APR-10 9:51:39AM	1"x1", flaking, not mineralized, adult	5
Tortoise Bone Fragment - Not Mineralized	BDCMR013	3722435	708983	06-APR-10 1:52:38PM	Bone fragment, growth line present, 3/4 x 3/4 in.	5
Tortoise Bone Fragment - Not Mineralized	BDCRK004	3728373	702578	06-APR-10 2:03:34PM	Old dermal bone fragment with scute line. Time since death >4 years. 1.5 x 1.5 inches.	5
Tortoise Bone Fragment - Not Mineralized	BDCMR014	3731603	706961	08-APR-10 11:44:32AM	Thigh bone, intact, not flaking easily. ~5 cm. long.	5

Map Label	IDENT	Y_PROJ	X_PROJ	Date	Notes	Class
Tortoise Bone Fragment - Not Mineralized	BDCRB003	3731673	710903	08-APR-10 9:56:01AM	Group of bone fragments spread over ~ 1 meter area with a few as far as 10 m. away. Bone not mineralized but pitted and easily flaked.	5
Tortoise Bone Fragment - Not Mineralized	BDCAD010	3724247	705824	10-MAR-10 4:20:09PM	Disarticulated tort bones @ tort pallet BDPEG002	5
Tortoise Bone Fragment - Not Mineralized	BDCMR015	3720141	708600	13-APR-10 11:08:21AM	A piece of desert tortoise bone (shell fragment) 1" x 3/4".	5
Tortoise Bone Fragment - Not Mineralized	BDCAD002	3723923	708182	15-MAR-10 10:11:59AM	1 piece tort bone, likely vertebral. 1.5 cm x 1 cm. Not mineralized	5
Tortoise Bone Fragment - Not Mineralized	BDCAD003	3724730	705750	17-MAR-10 3:43:51PM	8" x 6". Carapace and marginals fragment from an adult.	5
Tortoise Bone Fragment - Not Mineralized	BDCGL003	3725591	705934	17-MAR-10 9:39:30AM	1.5 x 0.5 inches, definitely tortoise, probably adult, 4 pieces, scattered.	5
Tortoise Bone Fragment - Not Mineralized	BDCRK001	3723949	707824	18-MAR-10 11:42:25AM	1" by 0.75" bone fragment. Aged, scute sutter line visible. Found in wash. Time since death > 4 years. Bone not mineralized.	5
Tortoise Bone Fragment - Not Mineralized	BDCMR001	3724436	706459	21-MAR-10 1:01:16PM	Carapace. 1.25" x 0.75". Float in middle of wash. 2 pieces.	5
Tortoise Bone Fragment - Not Mineralized	BDCMR002	3724556	706471	21-MAR-10 1:27:12PM	bone, 1/2" x 1.25" with backbone. Floating in wash.	5
Tortoise Bone Fragment - Not Mineralized	BDCMR003	3724587	706470	21-MAR-10 1:32:42PM	Pelvic girdle, placed at Art's carcass	5
Tortoise Bone Fragment - Not Mineralized	BDCGL007	3724427	706443	21-MAR-10 11:08:00AM	Old scute, found in middle of wash. 2.75" wide by 1.25" deep.	5
Tortoise Bone Fragment - Not Mineralized	BDCGL008	3724573	706444	21-MAR-10 11:18:06AM	6 bones, 5 scutes in wash.	5

Map Label	IDENT	Y_PROJ	X_PROJ	Date	Notes	Class
Tortoise Bone Fragment - Not Mineralized	BDCBH002	3725208	706973	21-MAR-10 2:04:39PM	Small piece of bone that is probably tortoise (good prob.) 20mm x 13 mm. Time since death > 4 years. In a large wash that recently flashed. Bone could have washed a long distance. Photo by DT.	5
Tortoise Bone Fragment - Not Mineralized	BDCRB001	3724487	708311	22-MAR-10 10:41:26AM	1 x 1cm. Potentially tort - no def id markings. Not found in wash.	5
Tortoise Bone Fragment - Not Mineralized	BDCGL009	3724606	706682	22-MAR-10 10:51:25AM	Scute floating in wash, 2 " square.	5
Tortoise Bone Fragment - Not Mineralized	BDCAD006	3723571	706753	22-MAR-10 4:05:39PM	1" x 1/2", floating in wash.	
Tortoise Bone Fragment - Not Mineralized	BDCBH003	3725063	708233	22-MAR-10 8:54:53AM	1: 2x2 cm. Found in wash in two isolated pieces. Def tort, scute seams apparent. See Photo. Time since death > 4 years. 2: limb bone, tortoise.	5
Tortoise Bone Fragment - Not Mineralized	BDCRK002	3724959	708273	22-MAR-10 9:34:45AM	6.5 x 4 cm found adjacent to wash (not same as BDCBH003. Near enough to potentially be same carcass, but scavenged. Def tort. 6 pieces.	5
Tortoise Bone Fragment - Not Mineralized	BDCDT001	3725588	706616	22-MAR-10 9:45:58AM	Scute floating in wash, 2 " square.	5
Tortoise Bone Fragment - Not Mineralized	BDCAD011	3725640	706944	23-MAR-10 1:22:58PM	Single piece of bone: 11mm x 7mm. Hard on both sides with wafer middle. TSD > 4 years.	5
Tortoise Bone Fragment - Not Mineralized	BDCGL011	3723666	706808	23-MAR-10 10:13:08AM	3 bone pieces from tortoise limb. Time since death > 4 years. Not in wash. Biggest piece if 1" x 0.5"	5
Tortoise Bone Fragment - Not Mineralized	BDCBH004	3724294	706918	23-MAR-10 2:35:24PM	Very small piece of bone: 20mm x 10mm. Hard on both sides, wafer in middle. SD > 4 years. In large wash, may have moved with water. Not mineralized.	5
Tortoise Bone Fragment - Not Mineralized	BDCBH005	3724358	706866	23-MAR-10 3:27:54PM	10 pieces of tort bone. TSD > 4 years. Partially buried in a wash. Scute seams apparent. Adult	5
Tortoise Bone Fragment - Not Mineralized	BDCGL015	3725077	708794	24-MAR-10 4:44:10PM	2.5 x 0.5 cm. Carapace fragment. Not mineralized.	5

Map Label	IDENT	Y_PROJ	X_PROJ	Date	Notes	Class
Tortoise Bone Fragment - Not Mineralized	BDCGL014	3723832	708533	24-MAR-10 8:33:48AM	1.5 x 1 cm carapace fragment. Not mineralized	5
Tortoise Bone Fragment - Not Mineralized	BDCAD008	3724549	708523	24-MAR-10 9:09:51AM	2 x 2 cm plastron fragment, not mineralized	5
Tortoise Bone Fragment - Not Mineralized	BDCRB002	3727582	708735	27-MAR-10 10:57:48AM	10+ pieces of tortoise bone fragment, flaking, adult plastron, some carapace, some pieces 7"x7"	5
Tortoise Bone Fragment - Not Mineralized	BDCSD006	3724617	706472	28-MAR-10 9:52:34AM		
Tortoise Bone Fragment - Not Mineralized	BDCMR010	3727152	705463	29-MAR-10 1:51:41PM	Adult animal, marginal, probably over leg 1.5 x 1", not mineralized	5
Tortoise Bone Fragment - Not Mineralized	BDCMR009	3727210	705563	29-MAR-10 11:40:15AM	2 pieces of bone, 1/4" x 1/4", likely juvenile, 1 piece marginal	
Tortoise Bone Fragment - Not Mineralized	BDCMR006	3727695	705547	29-MAR-10 8:23:25AM	Small piece of DT bone fragment, 1/2" x 1/4", not mineralized	5
Tortoise Bone Fragment - Not Mineralized	BDCMR007	3727716	705544	29-MAR-10 8:26:41AM	2 pieces of DT bone fragments, beginning to flake. 1 1/4" x 1/2" each	5
Tortoise Bone Fragment - Not Mineralized	BDCGL019	3728183	704631	29-MAR-10 9:13:29AM	Adult vertebral fragment, flaking, within wash. 1.5" x 1.5"	5
Tortoise Bone Fragment - Not Mineralized	BDCSD007	3728166	704548	29-MAR-10 9:19:02AM	Adult vertebral fragment, not same animal as BDCGL019. Beginning to flake.	5
Tortoise Bone Fragment - Not Mineralized	BDCDT002	3728158	704336	29-MAR-10 9:28:00AM	2 vertebrals, 2 costals, all attached. Adult. Flaking. 3.5" x 3.5"	5
Tortoise Bone Fragment - Not Mineralized	BDCGL020	3728177	704298	29-MAR-10 9:30:03AM	1 piece marginal adult bone fragment, 1/2" x 1/2, flaking.	5

Map Label	IDENT	Y_PROJ	X_PROJ	Date	Notes	Class
Tortoise Bone Fragment - Not Mineralized	BDCMR008	3728146	704238	29-MAR-10 9:34:10AM	One small piece with scute line, 1/4" x 1/4", flaking.	5
Tortoise Bone Fragment - Not Mineralized	BDCAD013	3722019	708067	30-MAR-10 1:03:17PM	1 marginal piece of tort bone from adult. 2" x 1.5"	5
Tortoise Bone Fragment - Not Mineralized	BDCMR011	3726728	712519	30-MAR-10 12:54:43PM	Small piece of juvenile tortoise bone. Not mineralized, plastron marginal	5
Tortoise Bone Fragment - Not Mineralized	BDCGL023	3723031	705036	31-MAR-10 11:27:11AM	1 piece of old DT bone, not mineralized. 1" x 1".	5
Tortoise Bone Fragment - Not Mineralized	BDCGL024	3723120	704920	31-MAR-10 11:35:23AM	1 marginal piece of tort bone from adult, plastron. 2" x 1".	5
Tortoise Bone Fragment - Not Mineralized	BDCGL027	3723891	706480	14-MAY-10 1:48:32PM	One piece of tortoise bone in wash, from subadult or small adult, not mineralized, 3/4" x 1/2", suture lines on bone	5
Tortoise Bone Fragment - Not Mineralized	BDCGL028	3725815	704291	14-MAY-10 5:10:33PM	Piece of tortoise bone in an arroyo, plastron piece, 1" x 1", additional piece found 20 m down wash towards NE, 1/4 of plastron intact, more pieces found further up wash from same animal,	5
Tortoise Bone Fragment - Not Mineralized	BDCAD024	3727004	704375	14-MAY-10 2:51:02PM	Female, large adult, about 30 cm, photo 29, almost completely disarticulated	5
Tortoise Bone Fragments	BDCGL001	3724767	707202	17-FEB-10 9:34:54AM	Tortoise vertebral bone fragment, bone flaking	5
Tortoise Bone Fragments	BDCAD001	3724756	706904	17-FEB-10 9:52:22AM	Nine pieces of bones scattered in wash. Possibly same animal as BDCGL001. Adult DT, another piece of plastron about 20 m to north.	5
Tortoise Bone Fragments	BDCGL002	3724797	706842	17-FEB-10 9:56:48AM	Two pieces of tortoise bone fragments, 2" x 2", one plastron, one carapace	5
Tortoise Bone Fragments - Not Mineralized	BDCAD022	3721595	708527	22-APR-10 1:38:04PM	Shell fragment from adult tortoise, marginal, 3 x 2 cm, not mineralized	5
Tortoise Bone Fragments - Not Mineralized	BDCAD021	3722649	708444	22-APR-10 10:48:44AM	Four shell fragments from adult tortoise, marginal dermal bones	5

Map Label	IDENT	Y_PROJ	X_PROJ	Date	Notes	Class
Tortoise Bone Fragments - Not Mineralized	BDCMR016	3722629	708469	22-APR-10 12:27:59PM	Shell fragment from adult tortoise, marginal, 3 x 2 cm, 1 fragment, not mineralized	5
Tortoise Burrow - Class 1	BDBBH005	3725366	705847	05-APR-10 11:16:13AM	11" w x 8" h x 30" deep (inches). Rock shelter. Flat bottom. No evidence of recent use. Substrate (rock) does not lend to tortoise shape. Probably tortoise because no other animal would excavate rock such as this. No definitive evidence of tortoise, however. Moments after writing the above statement a recent (this spring) tortoise scat was found approximately 40 meters away. Could change to Class 2.	5
Tortoise Burrow - Class 1	BDBRB002	3727217	702471	06-APR-10 10:55:17AM	Rock shelter: 2 openings (either side of rock). Class 5 tortoise scat (3 mm. wide x 22 mm. long). Deepest cover site 15 in. w x 10 in. h x 60 in. deep.	2
Tortoise Burrow - Class 1	BDBMR008	3723128	705517	06-APR-10 11:41:53AM	21 x 6 in., 4 ft. deep. 3 old scats (Class 3) at entrance, scats 1 x 1/2 inch. Several pallets nearby.	2
Tortoise Burrow - Class 1	BDBMR006	3722416	706180	06-APR-10 9:05:06AM	14 x 7 in., end not seen. Several old (Class 3) tortoise scats seen inside. No evidence of recent use. Several potential pallets also in this wash. Scats ~ 1 x 1/2 in.	2
Tortoise Burrow - Class 1	BDBMR009	3730036	713996	08-APR-10 4:37:14PM	Series of burrows (3 + 1 small entrance) in cobble stream bank. All within 5 m. of road.	2
Tortoise Burrow - Class 1	BDBAD011	3723817	706669	10-MAR-10 15:10:37	Recently used DETO burrow with DT tracks, can't see end. 11" X 6".	1
Tortoise Burrow - Class 1	BDBAD010	3723525	706655	10-MAR-10 2:37:42PM	Tortoise burrow in caliche, with DT tracks. 11" x 15", several meters deep, can't see to end. ALSO 9" x 5" desert tortoise pallet 10 m to west, active w/scuff marks,	1
Tortoise Burrow - Class 1	BDBGL010	3724262	706257	10-MAR-10 3:48:02PM	10" X 6" tort burrow, dead ends. with scat that is 1/2 " by 1/2", no gloss, black.	1
Tortoise Burrow - Class 1	BDBAD002	3724748	706955	17-FEB-10 9:43:31AM	Active tortoise burrow, whitewash present, tortoise scat (3 pieces - 2" x 1") outside burrow plus scat inside burrow, 300 mm wide burrow, plus tortoise pallet 3 m to west and a collapsed burrow 20 m to west	1
Tortoise Burrow - Class 1	BDBGL003	3724265	705875	17-MAR-10 2:57:07PM	14" x 8", ~1.5' - 2' deep. Fresh tortoise tracks. Scale marks in dirt, recent use. Photos 8-9.	1
Tortoise Burrow - Class 1	BDBGL005	3724457	706261	19-MAR-10 1:22:36PM	Occupied tortoise burrow, BDLGL001 present at entrance.	1

Map Label	IDENT	Y_PROJ	X_PROJ	Date	Notes	Class
Tortoise Burrow - Class 1	BDBGL006	3725501	706389	21-MAR-10 9:53:26AM	Tracks inside, 11" x 6". Active tortoise burrow, SW orientation	1
Tortoise Burrow - Class 1	BDBGL007	3723630	706804	22-MAR-10 4:14:41PM	Width 11" x 7", Tortoise scat outside entrance is 3 1/4" x 5/8"	3
Tortoise Burrow - Class 1	BDBGL014	3722437	706363	30-MAR-10 10:24:37AM	2 tortoise burrows in arroyo. 1 piece of tortoise scat in burrow, 11' x 7", 2 ft deep. Scat is 1" x 0.5", from younger animal.	Burrow = 1, scat = 3
Tortoise Burrow - Class 1	BDBGL015	3722511	706201	30-MAR-10 11:02:47AM	Active tortoise burrow. Active scat. Turns to left, can't see the end. 24" x 6". Scat is 1.5 x 1", tightly packed.	Burrow = 1, scat = 4
Tortoise Burrow - Class 1	BDBGL016	3722478	706164	30-MAR-10 11:12:44AM	Active tort burrow, scat inside. Large burrow, 18" x 10", can't see end. Scat is 1"x 0.5", loose, blackish.	Burrow = 1, scat = 4
Tortoise Burrow - Class 1	BDBAD008	3722373	706869	30-MAR-10 9:13:17AM	Active tortoise burrow with fresh tracks. Rock burrow. 9" x 6", 3-4' deep.	1
Tortoise Burrow - Class 1	BDBAD004	3722394	706557	30-MAR-10 9:54:26AM	Rock tortoise burrow. 24" x 7", 3' deep. Fresh tort tracks, veg is pushed over. Several rock pallets within 30 feet.	1
Tortoise Burrow - Class 1	BDBAD012	3723077	705057	31-MAR-10 11:06:14AM	Active DT burrow, tortoise inside. 15" x 7". 3 pallets across wash.	1
Tortoise Burrow - Class 1	BDBGL021	3723082	705068	31-MAR-10 11:16:52AM	Active DT burrow with fresh scat and tracks inside. 12" x 7'.	1
Tortoise Burrow - Class 1	BDBGL022	3723457	704616	31-MAR-10 12:01:36PM	9" x 7" DT burrow with 4 old scats. Largest is 2" x 1", smallest is 0.5" x 0.5". Tightly packed. Pallet 5 m away.	burrow = 1, scat = 3
Tortoise Burrow - Class 1	DDBAD014	3723607	704554	31-MAR-10 12:26:11PM	Juvenile DT burrow, 4" x 2". Scat inside burrow. Well developed berm. 4 pallets in area. Scat is 0.25" x 0.25", from juv.	burrow = 1, scat = 2.
Tortoise Burrow - Class 1	BDBAD014	3722005	706351	31-MAR-10 4:16:52PM	DT burrow with recent activity. 13' x 6", can't see the end.	1
Tortoise Burrow - Class 1	BDBAD015	3723607	704554	31-MAR-10 4:40:25PM	Juvenile tort burrow 4" x 2", scat inside burrow, well developed berm, 4 pallets in area. Scat is 0.25x 0.25" fro juv tort	1

Map Label	IDENT	Y_PROJ	X_PROJ	Date	Notes	Class
Tortoise Burrow - Class 1	BDBAD009	3723585	705051	31-MAR-10 9:08:50AM	Active tort burrow with tracks and scat. 10" x 5" rock burrow, up mountain. Scat is 1" x 1", tightly packed.	burrow = 1, scat = 3.
Tortoise Burrow - Class 1	BDBGL017	3723561	705037	31-MAR-10 9:18:36AM	Active tort burrow, rock burrow. 8 tortoise scats inside. Burrow narrows but tort uses back of burrow. Pallet near with tracks. Scat is tightly packed, largest is 2x1", smallest 0.5" x 0.5"	burrow = 1, scat = 5
Tortoise Burrow - Class 1	BDBGL019	3723478	705041	31-MAR-10 9:47:53AM	Active tortoise burrow with tracks and lots of scat on top of mountain. Can't see end. Scat tightly packed, light brown, about 5 pieces. Largest 3" x 1".	burrow = 1, scat - 3
Tortoise Burrow - Class 2	BDBBH004	3725482	705884	01-APR-10 3:13:17PM	Excellent rock shelter 18"x10", 40" deep. No evidence of recent use. Located in a large rock pile. Flat bottom and contoured sides provide evidence of DT use in the past.	2
Tortoise Burrow - Class 2	BDBMR004	3725478	705892	01-APR-10 3:14:15PM	Rock shelter, 3 DT bones found within 2 meters. Disarticulated (5).	2
Tortoise Burrow - Class 2	BDBMR005	3725681	705831	01-APR-10 4:11:26PM	12" wide x 7" tall with a pallet nearby, north facing in a conglomerate of cobble	2
Tortoise Burrow - Class 2	BDBDT001	3722413	706168	06-APR-10 9:05:04AM	Wide burrow in caliche in bank of wash, 24 x 8 in., 5 ft deep. Mammal scat inside, no recent tortoise use.	2
Tortoise Burrow - Class 2	BDBBH015	3731133	704043	08-APR-10 3:12:43PM	Caliche burrow with flat bottom and tortoise carapace-shaped roof. 15 in. w x 11 in. h x unknown depth. In a wash bank. Disturbed soil shows signs of activity but gravel bottom does not show tracks so use is uncertain.	2
Tortoise Burrow - Class 2	BDBGL012	3724875	705912	10-MAR-10 4:47:32PM	4 tort burrows, 1 pallet, def. tortoise. Good condition but no tort sign.	2
Tortoise Burrow - Class 2	BDBGL027	3722227	707903	13-MAY-10 9:12:20AM	Tortoise burrow, 15" x 8", partial plug, 2' deep, no recent sign, NE facing, under ironwood	2
Tortoise Burrow - Class 2	BDBGL002	3724227	705857	17-MAR-10 2:52:13PM	2 large tortoise burrows. Can't see the end of one of them, no signs of recent use.	2
Tortoise Burrow - Class 2	BDBMR002	3724402	706465	21-MAR-10 1:08:52PM	2 burrows side by side. 9 x 6" tall 9" x 7.5" tall. In north facing bank, clay, cobble, calax formation.	2
Tortoise Burrow - Class 2	BDBBH003	3727559	705297	31-MAR-10 1:05:04PM	10" x 7.5", 30" deep. Annual veg in entrance, no disturbed soil. Burrow is long-lasting, in a consolidated wash with cobble.	2

Map Label	IDENT	Y_PROJ	X_PROJ	Date	Notes	Class
Tortoise Burrow - Class 2	BDBGL020	3723309	705356	31-MAR-10 10:39:01AM	DT burrow, bottom of mountain. Tracks (poss. Tort), pallet 10 m away. 15" x 12". Very deep, turns left, can't see the end.	2
Tortoise Burrow - Class 2	BDBAD013	3723484	704608	31-MAR-10 12:07:04PM	8" x 5" DT burrow halfway up mountain. Can't see the end	2
Tortoise Burrow - Class 2	BDBGL024	3722106	706110	31-MAR-10 4:38:58PM	DT burrow 11" x 6". Can't see the end. Def. DT burrow. No recent sign.	2
Tortoise Burrow - Class 2	BDBAD018	3726202	704320	14-MAY-10 3:46:49PM	Burrow/shelter in conglomerate rock bank of arroyo, 4+ more within 20 m, same arroyo, 16" x 8", depth unknown	2
Tortoise Burrow - Class 3	BDBAD001	3724754	707220	17-FEB-10 9:25:06AM	Potential tortoise burrow	3
Tortoise Burrow - Class 3	BDBGL001	3724313	705979	17-MAR-10 2:43:47PM	Definitely made by tortoise, currently used by woodrat, end not seen, no evidence of recent tortoise use. 12 x 6 inches, at 3-4 feet deep.	3
Tortoise Burrow - Class 3	BDBGL004	3725352	706137	18-MAR-10 10:26:19AM	8" x 4". Tortoise burrow, from small animal. Not badly deteriorated. Not active.	3
Tortoise Burrow - Class 3	BDBAD003	3724378	706481	21-MAR-10 1:17:15PM	North facing burrow. 10" w x 4". Small arroyo, 3' deep. Plugged toward back.	3
Tortoise Burrow - Class 3	BDBMR001	3724557	706457	21-MAR-10 12:41:40PM	9 x 5" wide, caved in, partially blocked but could be cleared out.	3
Tortoise Burrow - Class 3	BDBGL023	3721675	706636	31-MAR-10 3:47:38PM	Old DT burrow, partially collapsed. Piece of DT eggshell, KF scat in area. 6" x 4", used to be bigger. 2 burrows total. Definitely tortoise.	3
Tortoise Burrow - Class 4	BDBRK001	3727534	705087	05-APR-10 2:12:45PM	24 x 8 in., ~ 2 ft. deep burrow in side of wash, currently used by woodrat.	4
Tortoise Burrow - Class 4	BDBBH006	3727103	702555	06-APR-10 10:25:23AM	Dug out rock shelter. Inactive. Soil floor, undisturbed. 24 in. w x 10in. h in. x 30 in. deep.	4
Tortoise Burrow - Class 4	BDBRB001	3727174	702493	06-APR-10 10:40:55AM	Rock shelter is 30 ft. upslope from BDBRK002: 15 in. w x 6 in. h x 36 in. deep.	4
Tortoise Burrow - Class 4	BDBBH008	3728554	702168	06-APR-10 12:36:05PM	Rock shelter, flat soil bottom. Old kit fox scat out front but tortoise shape. 11 in. w x 9 in. h x 36 in. deep.	4
Tortoise Burrow - Class 4	BDBBH009	3728315	702582	06-APR-10 2:08:36PM	Large rock shelter with flat soil bottom. 20 in. w x 12 in. h x 60 in. deep. Inactive.	4
Tortoise Burrow - Class 4	BDBAD016	3722181	707952	13-MAY-10 10:31:31AM	Collapsed tortoise burrow, near scat (BDSGL003) under ironwood	4

Map Label	IDENT	Y_PROJ	X_PROJ	Date	Notes	Class
Tortoise Burrow - Class 4	BDBBH001	3724509	707375	20-MAR-10 8:43:31AM	Deteriorated, unused, partially collapse and eroded, but generally tortoise shaped. 14" w x 9", 36" deep.	4
Tortoise Burrow - Class 4	BDBWV001	3724762	707032	21-MAR-10 11:07:24AM	Two connected burrows, possible tortoise, inactive. Veg in entrance, eroded to the point where origin cannot be determined. Inside of wash, 8 x 5", end not seen. Marginal for BUOW	4
Tortoise Burrow - Class 4	BDBBH002	3723756	708751	24-MAR-10 3:49:42PM	Burrow under ironwood in microphyll woodland wash. 210 mm wide x 180 mm, 250 mm deep. Pack rat midden that had been dug out, typical of tortoise. Burrow inactive, with no def tortoise sign. Poss dug out by carnivore.	4
Tortoise Burrow - Class 4	BDBGL013	3723640	708851	25-MAR-10 10:03:39AM	potential tortoise burrow in caliche. No evidence of use, hole in roof. Deteriorated. 12" x 8", 2' deep.	4
Tortoise Burrow - Class 4	BDBMR101	3721370	708368	26-APR-10 12:21:24PM	Potential tortoise burrow, 24" wide x 6" tall, depth unknown, flat bottom, currently unused, southern orientation, embankment in wash plus mammal burrow 3 meters to west, 9" wide x 4" tall	4
Tortoise Burrow - Class 4	BDBMR010	3722876	707534	14-MAY-10 9:40:10AM	7" wide x 4" tall, good initial shape but collapsed, could still be used as pallet, no recent sign of use, very flat entrance	4
Tortoise Burrow - Class 5	BDBGL025	3726201	704107	01-APR-10 1:01:20PM	Possible tortoise burrow, 6 pallets in side of wash within ~20m. 11x6", 30" deep, no signs of recent activity.	5
Tortoise Burrow - Class 5	BDBGL026	3724145	704766	01-APR-10 3:09:55PM	8x5", ~2' deep. At ridgeline of steep, rocky slope.	5
Tortoise Burrow - Class 5	BDBBH007	3727112	702540	06-APR-10 10:30:48AM	Dug out rock shelter, same as BDBBH006, better condition. Same dimensions.	5
Tortoise Burrow - Class 5	BDBRK002	3727177	702512	06-APR-10 10:37:30AM	Rock shelter. Dug out, flat bottom. 13 in. w x 10 in. h x 36 in. deep. Inactive.	5
Tortoise Burrow - Class 5	BDBDT002	3722437	709207	06-APR-10 2:04:24PM	8 x 8 in., inside of berm along road. End not seen. Flat bottom, no sign of tortoise use.	5
Tortoise Burrow - Class 5	BDBMR007	3722600	706048	06-APR-10 9:38:54AM	Small rock cavern, 17 x 7 in., narrows as it goes back but at least 5.5 ft. deep. No signs of tortoise use.	5
Tortoise Burrow - Class 5	BDBBH010	3729134	702559	08-APR-10 1:01:16PM	14 in. w x 11 in. h x 40 in. deep. Same as BDBRK003.	5

Map Label	IDENT	Y_PROJ	X_PROJ	Date	Notes	Class
Tortoise Burrow - Class 5	BDBRK003	3730080	702156	08-APR-10 10:50:17AM	16 in. w x 10 in. h x 24 in. deep. Inactive. Flat gravel bottom. Impossible to say what made this burrow and has used it. Possibly tortoise, it is suitable.	5
Tortoise Burrow - Class 5	BDBRK004	3730048	702155	08-APR-10 10:57:07AM	20 in. w x 12 in. h x 30 in. deep. Rock shelter. Same characteristics as BDBRK003.	5
Tortoise Burrow - Class 5	BDBBH011	3729653	702550	08-APR-10 2:00:48PM	14 in. w x 10 in. h x 24 in. deep. Rock shelter. Inactive. Suitable for tortoise.	5
Tortoise Burrow - Class 5	BDBBH012	3729733	702544	08-APR-10 2:11:34PM	20 in. w x 10 in. h x 36 in. deep. Flat-bottomed rock shelter. Suitable for tortoise.	5
Tortoise Burrow - Class 5	BDBBH013	3729755	702546	08-APR-10 2:14:26PM	11 in. w x 10 in. h x 40 in. deep. Flat-bottomed rock shelter. Suitable for tortoise.	5
Tortoise Burrow - Class 5	BDBBH014	3731147	704005	08-APR-10 3:07:39PM	24 in. w x 8 in. h x 25 in. deep. Caliche burrow. Inactive. Wide with flat bottom. Suitable for tortoise.	5
Tortoise Burrow - Class 5	BDBGL009	3722449	706414	30-MAR-10 10:07:45AM	Large DT burrow, rock burrow, no sign of recent use. 25" x 12", 4' deep	5
Tortoise Burrow - Class 5	BDBAD005	3722531	706192	30-MAR-10 11:06:12AM	Rock burrow. 24" x 12"	5
Tortoise Burrow - Class 5	BDBMR003	3726880	711626	30-MAR-10 11:20:35AM	Burrow in berm, could be either KF or potential for tortoise, flat bottom	5
Tortoise Burrow - Class 5	BDBAD006	3721979	707036	30-MAR-10 12:33:35PM	Tortoise burrow, and a rock pallet 5 M away. Burrow = 12" x 6"	5
Tortoise Burrow - Class 5	BDBAD007	3722002	707404	30-MAR-10 12:46:35PM	Tortoise burrow, rock burrow. 10" x 5". Rock pallet about 15 M away.	5
Tortoise Burrow - Class 5	BDBGL018	3723545	705035	31-MAR-10 9:28:50AM	Potential tortoise burrow. Large, in rocky area, no sign. 30" x 10", 3 feet deep.	5
Tortoise Burrow - Class 5	BDBMR011	3721874	707858	14-MAY-10 11:21:22AM	Tortoise burrow and pallet, near BDBEG001, 16" x 8", can't see to end of burrow, no sign, in old kit fox complex, possibly tortoise	5
Tortoise Burrow - Class 5	BDBAD017	3727026	704391	14-MAY-10 2:38:14PM	12 x 6", depth unknown, burrow site in conglomerate clay bank of arroyo, wood rat also present, south facing	5
Tortoise Burrow - Class 5	BDBMR012	3724255	705626	14-MAY-10 2:21:20PM	Rock shelter, 10" wide x 12" high x 6' deep, tortoise may have used, no recent sign or scat, but high probability this was used at one time	5

Map Label	IDENT	Y_PROJ	X_PROJ	Date	Notes	Class
Tortoise Burrow - Class 5	BDBMR013	3724258	705456	14-MAY-10 2:36:37PM	Two burrows in wash wall, one is 2' x 2' but narrows into tortoise shape, and is 6' deep (?) the other is 2' x 1.5' tall, less deep, cannot see end, no recent tortoise sign, bird tracks inside, found in very rocky wash	5
Tortoise Burrow - Class 5	BDBMR014	3724602	705000	14-MAY-10 3:09:57PM	Rock shelter, 12" wide x 9" tall, several feet deep, nice runway going to it, not unreasonable for tortoise to use but unclear who made burrow	5
Tortoise Burrow (Active) - Class 1	BDBEG001	3721898	707793	14-MAY-10 11:05:40AM	Active tortoise burrow with tortoise inside (BLDEG001), 16" x 6" can't see to end	1
Tortoise Carcass - Class 2	BDCGL010	3724287	706228	10-MAR-10 3:54:28PM	Tort carcass, no sheen on scutes, some scutes still attached, MCL 12.5", PLN = 10", some vertebrae inside, some leg bones. Male.	2
Tortoise Carcass - Class 2	BDCAD004	3726062	706417	21-MAR-10 9:18:26AM	MCC = 9.5". Part of tail and legs in carcass, scutes just starting to drop.	2
Tortoise Carcass - Class 2	BDCGL012	3725209	706864	23-MAR-10 11:37:55AM	Juvenile, TSD = 1-2 years. Est. MCL = 55 mm. Cara[ace bones present, cracked and broken, evidence of depredation. Class 2: Scutes generally normal in color but beginning to fade. Class 5: scattered because depredations	2,5
Tortoise Carcass - Class 3	BDCBH001	3723819	704474	17-FEB-10 11:52:14AM	Female adult tortoise carcass. Time of death approximately 4 years ago. MCL = 205 mm	3
Tortoise Carcass - Class 3	BDCSD001	3724882	706191	19-MAR-10 9:56:25AM	Juvenile DT piece of carcass, ~5 year old DT marginals, on scute attached (sheen) 2" x 1".	3?
Tortoise Carcass - Class 4	BDCGL025	3725924	704183	01-APR-10 12:47:28PM	Adult female carcass. Tortoise was at least 20 years old. 4.5 MCL, some scutes still attached.	4
Tortoise Carcass - Class 4	BDCBH007	3727526	702744	06-APR-10 3:02:27PM	Plastron and some marginals from a 245 estimated MCL (tape measure) female tortoise. Bone beginning to disarticulate. Growth ring peeling. Bone without sheen. Carcass tumbled down rocky drainage.	4
Tortoise Carcass - Class 4	BDCRK003	3726493	703918	06-APR-10 9:30:55AM	Anterior 2/3 of carcass (plastron and carapace). Bone flakes easily, bone beginning to pit. Estimated time of death at 3-4 years. Female based on size of gular. MCL = 250mm. Carcass located on side of drainage.	4
Tortoise Carcass - Class 4	BDCAD005	3724566	706451	21-MAR-10 12:46:58PM	8.25" wide, large female. Front half of shell.	4
Tortoise Carcass - Class 4	BDCMR004	3724599	706624	22-MAR-10 9:04:55AM	8.5 MCL, adult female, mostly intact. Photos 1-2.	4

Map Label	IDENT	Y_PROJ	X_PROJ	Date	Notes	Class
Tortoise Carcass - Class 4	BDCAD023	3727012	704377	14-MAY-10 2:45:27PM	Female adult tortoise carcass, about 25 cm, photo 28	4
Tortoise Drinking Depression	BDOWV001	3724719	706958	21-MAR-10 2:48:44PM	Tortoise drinking depression on pavement, above known burrow (35 M away). Photos taken.	
Tortoise Egg Shell Fragment	BXDOCG001	3724919	706525	10-APR-10 9:48:34AM	3 pieces of tortoise egg shell fragments. Average size: 2mm. X 2 mm. Shell fragments on spoil pile of kit fox natal complex BXKBBH001. Photos on CG camera. Shell fragments typical for tortoise: thin and translucent lacking external pock marks found on avian eggs.	
Tortoise Egg Shell Fragment	BDOGL001	3724509	706236	19-MAR-10 12:51:42PM	Small piece of tortoise egg shell fragment, found in drainage, not near burrow.	
Tortoise Egg Shell Fragment	BDOBH001	3724360	706863	23-MAR-10 3:32:17PM	Tortoise eggshell. Approx 1/6 of shell present. In a wash. Translucent appearance, thin. Ping-pong ball curvature. Photos: Art D and RS.	
Tortoise Fossilized Bones	BDCDT005	3725516	708849	04-APR-10 1:39:36PM	Fossilized dermal bone with non-familiar scute junction. Possible Chelonidae. Photos taken by Dana Terry.	5
Tortoise Pallet	BDPAD013	3721131	708119	23-APR-10 2:55:14PM	Potential Tortoise Pallet, 8 x 4 x 12, good shape	5
Tortoise Pallet - Class 1	BDPGL014	3723084	705088	31-MAR-10 11:00:08AM	Large DT pallet in wash. Fresh tracks inside. Plastron marks in dirt. 20" x 10".	1
Tortoise Pallet - Class 1	BDPGL015	3723030	705037	31-MAR-10 11:25:29AM	4 DT pallets, 1 is active w/ fresh tracks and plastron marks.	1
Tortoise Pallet - Class 1	BDPAD016	3723557	705055	31-MAR-10 9:22:22AM	13" x 7" tort pallet with recent activity. Rock pallet, multiple pallets in area.	1
Tortoise Pallet - Class 2	BDSDT001	3725402	705874	05-APR-10 11:20:26AM	2.5 x 2 cm., slight glaze, some odor, but dry. Scat out in open. Photos taken.	2
Tortoise Pallet - Class 2	BDPMR007	3723102	705542	06-APR-10 11:57:33AM	Excavation under rock, flat bottom with soft soil, 13 x 6.5 in., 4 ft. deep.	2
Tortoise Pallet - Class 2	BDPDT007	3722102	706183	06-APR-10 8:26:46AM	Definitely tortoise, no evidence of recent use. 12" x 7", 18" deep, in side of wash in caliche.	2
Tortoise Pallet - Class 2	BDBGL011	3724673	705887	10-MAR-10 16:34:19	Tort burrow/ pallet, 14" x 7", 22" deep	2
Tortoise Pallet - Class 2	BDPAD011	3724196	706540	10-MAR-10 3:32:16PM	DT pallet, recently active. 10" x 7", rock.	2

Map Label	IDENT	Y_PROJ	X_PROJ	Date	Notes	Class
Tortoise Pallet - Class 2	BDPAD003	3724762	707474	17-FEB-10 10:14:54AM	Tortoise pallet, 8" wide x 10" deep	2
Tortoise Pallet - Class 2	BDPAD004	3724650	706183	18-MAR-10 9:55:23AM	Definite tortoise pallet. No signs of recent use. 11" x 6", ~1 foot deep.	2
Tortoise Pallet - Class 2	BDPMR001	3725280	706406	21-MAR-10 10:07:41AM	Tort pallet, north facing, not being used this year. 9 x 5".	2
Tortoise Pallet - Class 2	BDPMR002	3727555	705471	29-MAR-10 1:20:47PM	~7" wide x 3.5" tall, ~16" deep. Definitely DT, no signs of recent activity	
Tortoise Pallet - Class 2	BDPAD014	3722461	706315	30-MAR-10 10:46:53AM	Tortoise pallet, a rock pallet. Older tort tracks inside. Another pallet 10 M away.	2
Tortoise Pallet - Class 2	BDPGL005	3722353	707151	30-MAR-10 8:43:26AM	Potential tort pallet in caliche in wash. Large opening. 24" x 10", 1.5' deep.	2
Tortoise Pallet - Class 2	BDPAD020	3723483	705117	31-MAR-10 10:01:48AM	Potential tort pallet. Entrance flattened. 9" x 6", perfect tort shape.	2
Tortoise Pallet - Class 2	BDPGL016	3722066	706250	31-MAR-10 4:24:23PM	DT pallet in wash, 12" x 7". No recent use but def. DT.	2
Tortoise Pallet - Class 2	BDPAD018	3723523	705050	31-MAR-10 9:38:01AM	Definite tort pallet, rock pallet 8" x 9". Another pallet 10 m away.	2
Tortoise Pallet - Class 2	BDPAD019	3723500	705054	31-MAR-10 9:44:28AM	12" x 6" rock pallet, recent use.	2
Tortoise Pallet - Class 2	BDPAD021	3727027	705140	14-MAY-10 2:12:30PM	8" x 4" x 8" pallet, in edge of arroyo, north facing slope	2
Tortoise Pallet - Class 3	BDPDT005	3726203	704146	01-APR-10 1:08:06PM	Large rock shelter, 40 x 12" opening in side of wash, no evidence of recent activity	
Tortoise Pallet - Class 3	BDPDT006	3725567	704630	01-APR-10 1:48:53PM	Large rock shelter on steep slope, 24"x36", ~4' deep	
Tortoise Pallet - Class 3	BDPGL019	3724972	704305	01-APR-10 11:37:37AM	3 potential pallets in rock, good condition, poss. DT.	
Tortoise Pallet - Class 3	BDPDT004	3725130	704238	01-APR-10 11:59:25AM	2 rock shelters, possible DT pallets, 12x18".	
Tortoise Pallet - Class 3	BDPGL020	3724689	704750	01-APR-10 2:36:12PM	30x18" rock pallet, ~20" deep, no sign of recent use	
Tortoise Pallet - Class 3	BDPDT003	3723770	704434	01-APR-10 9:24:51AM	3 pallets within 5 meters in side of wash. 14" x 8", ~18" deep. No sign of recent activity.	
Tortoise Pallet - Class 3	BDPAD002	3724751	707213	17-FEB-10 9:31:07AM	Potential tortoise pallet, collapsed, may turn to left, recheck during surveys	3

Map Label	IDENT	Y_PROJ	X_PROJ	Date	Notes	Class
Tortoise Pallet - Class 4	BDPAD001	3724412	707527	17-FEB-10 9:04:58AM	Plugged potential tortoise pallet, rain event may have caused plug, recheck during surveys. Suitable for DT.	4
Tortoise Pallet - Class 4	BDPSD001	3725329	706264	20-MAR-10 9:19:23AM	Potential DT pallet in caliche. 9 x 6", veg at entrance	4
Tortoise Pallet - Class 4	BDPDT002	3725325	706278	20-MAR-10 9:21:03AM	Very open caliche, potential DT pallet. 12 x 6".	$
Tortoise Pallet - Class 4	BDPDG001	3724834	706597	22-MAR-10 9:16:26AM	DT pallet, north facing, small wash. 7" wide x 4". Galleta grass	4
Tortoise Pallet - Class 5	BDPGL021	3724182	704757	01-APR-10 3:06:16PM	4 possible pallets in rock face on steep slope. No sign of use.	
Tortoise Pallet - Class 5	BDPCG001	3725760	705807	05-APR-10 10:45:47AM	25 cm. x 10 cm. x 30cm. deep @ wash. Summer burrow/pallet, west orientation.	5
Tortoise Pallet - Class 5	BDPDT011	3723234	705489	06-APR-10 11:10:29AM	Small rock shelter, 12 x 7 in., 12 in. deep. No sign of tortoise use.	5
Tortoise Pallet - Class 5	BDPDT012	3723289	705384	06-APR-10 11:18:15AM	Shelter under rock ledge, 18 x 10 in., 18 in. deep, soft soil on bottom. No signs of tortoise use.	5
Tortoise Pallet - Class 5	BDPMR005	3723148	705503	06-APR-10 11:37:21AM	Pallet in side of wash, caliche, 12 x 8 in., 18 in. deep. Several other potential pallets in this wash.	5
Tortoise Pallet - Class 5	BDPMR006	3723176	705529	06-APR-10 11:50:59AM	Rock shelter with soft dirt bottom, south-facing slope.	5
Tortoise Pallet - Class 5	BDPMR003	3722113	706179	06-APR-10 8:31:54AM	Small rock cavern in side of wash, ~24 x 24 in, ~ 12 in deep. Not dug by tortoise but could be used.	5
Tortoise Pallet - Class 5	BDPDT008	3722130	706194	06-APR-10 8:38:45AM	~30 x 8 in., ~ 8 in. deep, in caliche in side of wash, no evidence of recent use.	5
Tortoise Pallet - Class 5	BDPMR004	3722627	706097	06-APR-10 9:29:10AM	Large opening in side of wash, 36 x 8 in., 3 ft. deep, stone cave with soft bottom, no sign of tortoise use.	5
Tortoise Pallet - Class 5	BDPDT009	3722618	706043	06-APR-10 9:34:30AM	Wide rock cavern on steep, rocky slope, 30 x 8 in., ~20 in. deep. No signs of tortoise use.	5
Tortoise Pallet - Class 5	BDPDT010	3722650	706019	06-APR-10 9:46:08AM	Small rock cavern on steep rocky slope, 11 x 12 in., 2.5 ft. deep, no signs of tortoise use.	5
Tortoise Pallet - Class 5	BDPAD010	3723545	708902	10-MAR-10 10:47:51AM	Potential DT pallet (Caliche). No sign.	5
Tortoise Pallet - Class 5	BDPEG001	3724272	705876	10-MAR-10 4:13:14PM	Tort pallet, no sign of recent use. 9" x 5".	5
Tortoise Pallet - Class 5	BDPEG002	3724247	705820	10-MAR-10 4:20:24PM	Tort pallet w/ bones, 12" x 6", no recent activity.	5

Map Label	IDENT	Y_PROJ	X_PROJ	Date	Notes	Class
Tortoise Pallet - Class 5	BDPDT001	3725043	705945	17-MAR-10 10:06:15AM	~12 inches deep, 12 inches wide, no recent activity, caliche.	
Tortoise Pallet - Class 5	BDPGL001	3724498	706245	19-MAR-10 12:53:55PM	Potential tortoise pallet, caliche, good condition, no evidence of use.	5
Tortoise Pallet - Class 5	BDPGL003	3724461	706294	20-MAR-10 10:31:58AM	Potential tort pallet. 10" wide x 7". In wash.	5
Tortoise Pallet - Class 5	BDPGL004	3724601	706350	20-MAR-10 12:43:30PM	Potential DT pallet, caliche. 7" x 6". 1.5' deep.	5
Tortoise Pallet - Class 5	BDPGL002	3725169	706291	20-MAR-10 9:46:03AM	Potential DT pallet, caliche, no evidence of use.	5
Tortoise Pallet - Class 5	BDPAD009	3722418	706460	30-MAR-10 10:08:10AM	Potential tortoise pallet, rock pallet. 24" x 9", 2' deep. Another pallet 5 feet away	5
Tortoise Pallet - Class 5	BDPAD012	3722460	706334	30-MAR-10 10:29:53AM	Tortoise pallet, rock pallet. 20" x 10".	5
Tortoise Pallet - Class 5	DPAD013	3722475	706312	30-MAR-10 10:35:19AM	3 potential tort pallets, 1 is perfect for a smaller tortoise.	5
Tortoise Pallet - Class 5	BDPGL011	3722482	706258	30-MAR-10 10:53:26AM	Potential tort pallet. Rock pallet. 16" x 15", 2 ft deep.	5
Tortoise Pallet - Class 5	BDPGL012	3721998	706510	30-MAR-10 11:41:48AM	Potential tort pallet. 25" x 15". Multiple pallets in wash	5
Tortoise Pallet - Class 5	BDPGL013	3721966	706798	30-MAR-10 12:09:55PM	Potential tortoise pallet, rock pallet. 40" x 30"	5
Tortoise Pallet - Class 5	BDPAD015	3722008	706912	30-MAR-10 12:25:40PM	Rock pallet, potential for tortoise. 12" x 6"	5
Tortoise Pallet - Class 5	BDPAD005	3722348	707146	30-MAR-10 8:47:34AM	Potential tort pallet. Smaller size, for small tortoise. No evidence of recent use. 9" x 5", 10" deep.	5
Tortoise Pallet - Class 5	DDPGL006	3722373	707127	30-MAR-10 8:53:15AM	Potential tort pallet, rock pallet. 8" x 6", 15" deep.	5
Tortoise Pallet - Class 5	BDPGL007	3722388	706946	30-MAR-10 9:01:50AM	4 potential tort pallets in wash. Small. Should check area.	5
Tortoise Pallet - Class 5	BDPAD006	3722364	706903	30-MAR-10 9:06:06AM	Potential tortoise pallet, rock pallet, 12" x 6".	5
Tortoise Pallet - Class 5	BDPGL008	3722379	706872	30-MAR-10 9:09:35AM	Potential tortoise pallet, rock pallet, 10" x 9", 2' deep.	5
Tortoise Pallet - Class 5	BDPAD007	3722373	706862	30-MAR-10 9:14:49AM	Potential tort pallet, rock pallet, 15" x 10". 4 other rock shelters in vicinity.	5

Map Label	IDENT	Y_PROJ	X_PROJ	Date	Notes	Class
Tortoise Pallet - Class 5	BDPAD008	3722371	706837	30-MAR-10 9:20:11AM	Potential tort pallet, rock pallet/ shelter. 12" x 6".	
Tortoise Pallet - Class 5	BDPGL009	3722372	706769	30-MAR-10 9:24:35AM	Tortoise pallet in wash. 10" x 6", 1' deep.	5
Tortoise Pallet - Class 5	BDPGL010	3722359	706734	30-MAR-10 9:29:15AM	Potential tortoise pallet in wash. 20" x 10", 1' deep.	5
Tortoise Pallet - Class 5	BDPGL017	3722070	706159	31-MAR-10 4:29:50PM	32" x 15" large pallet. Flat bottom, front of pallet flattened.	5
Tortoise Pallet - Class 5	BDPGL018	3722992	705094	31-MAR-10 5:19:40PM	Large rock pallet, 30" x 20". Potential for DT	5
Tortoise Pallet - Class 5	BDPAD017	3723539	705047	31-MAR-10 9:34:02AM	10" x 5" tort pallet, rock pallet, no sign.	5
Tortoise Pallet - Class 5	BDPMR008	3722721	707565	14-MAY-10 10:00:21AM	9" wide x 4" tall x 11" deep, looks good, potential pallet for tortoise, no sign, two rodent holes in back, but large dirt apron	5
Tortoise Scat - Class 1	BDSMR001	3721898	707793	14-MAY-10 11:17:33AM	Tortoise scat, fresh, 4 pieces outside of BDBEG001, 3 new, 1 old, largest piece 1 1/2" x 1/2"., all tightly packed and dark brown, classes 1 to 3	1
Tortoise Scat - Class 2	BDSAD001	3723729	706751	22-MAR-10 3:56:38PM	Green, some odor, grain lined up, 2X2", maybe 3 pieces together	2
Tortoise Scat - Class 2	BDSGL004	3726067	704490	14-MAY-10 5:22:04PM	Three tortoise scats in wash, big scats from large tortoise, some odor, tightly packed, medium brown, 1 1/2" x 1/2"	2
Tortoise Scat - Class 3	BDSGL003	3722187	707952	13-MAY-10 10:28:21AM	Desert tortoise scat, 0.5" x 0.5", 1 scat, north side of ironwood	3
Tortoise Scat - Class 3	BDSGL001	3724660	705976	17-MAR-10 10:53:46AM	0.5" x 0.5" tortoise scat. Poo from last season. Likely from subadult. In woodrat nest.	3
Tortoise Scat - Class 4	BDSSD001	3726211	704453	14-MAR-10 11:10:26AM	DT scat, bleached, loose. 2.5" x 3/4"	4
Tortoise Scat - Class 5	BDSRB001	3726609	703274	06-APR-10 9:54:50AM	Possible tortoise scat. White color. Questionable, but scat is composed entirely of soil, gravel, and plant material. Very old. Photos taken.	
Tortoise Scat - Class 5	BDSGL002	3724461	706201	19-MAR-10 10:23:40AM	Tortoise scat, 1 1/4" long x 1/2" wide. Bleached, loose.	5
Tortoise Tracks	BDTAD001	3724622	706007	17-MAR-10 12:14:25PM	Tracks in sand, bottom of wash. 9 inches across. Fresh tracks, photos 5-7.	

Map Label	IDENT	Y_PROJ	X_PROJ	Date	Notes	Class
Tortoise Tracks	BDTDT001	3724668	705883	17-MAR-10 3:24:13PM	Found fresh tracks leading away from BDBGL001. Approx. 8 inches wide. Photos 10-11.	
Tortoise Tracks	BDTGL001	3724465	706350	20-MAR-10 12:51:23PM	Adult tortoise tracks. Width from midfoot to midfoot = 8". Photo.	
Tortoise Tracks	BDTMR001	3725587	706501	21-MAR-10 5:21:49PM	Tracks in wash. 8" spread on tracks, headed east down wash.	
Tortoise Tracks	BDTAD002	3726008	706383	21-MAR-10 9:28:10AM	9" track width, tracks found across tank tracks.	
Tortoise Tracks	BDTAD003	3725533	706411	21-MAR-10 9:48:44AM	8.5" wide. Tracks in wash, headed NE.	
Tortoise Tracks	BDTGL002	3723607	706810	23-MAR-10 10:19:50AM	Recent tortoise tracks: 8.5" outside to outside.	
Utah Vine Milkweed	BOOBH001	3725135	708292	22-MAR-10 9:21:02AM	Utah climbing milkweed in wash climbing in galletta grass	
Utah Vine Milkweed	B00BH002	3724187	709047	25-MAR-10 3:10:53PM	Utah climbing milkweed, small yellow flowers. Growing in various shrubs.	
Woodpecker Nest	BNEMR001	3730458	712723	07-APR-10 3:24:18PM	1 3/8 inch circular woodpecker nest entrance in dead palo verde in wash, 7.5 feet from the ground. Photos taken.	

ATTACHMENT 6

WILDLIFE SPECIES DETECTED DURING FOCUSED DESERT TORTOISE SURVEYS SPRING 2010

WILDLIFE SPECIES DETECTED DURING FOCUSED DESERT TORTOISE SURVEYS SPRING 2010

Scientific Name		Common Name
INVERTEBRATES		
Order Coleoptera		Beetles
	Family *Meloidae*	Blister beetles
	Lytta magister	
Order Arachinida		Spiders
	Family Theraphosideae	Tarantulas
	Aphonopelma sp.	
AMPHIBIANS		
Order Anura		
	Family Bufonidae	
	Bufo woodhousii	Woodhouse's toad
REPTILES		
Order Squamata		Lizards and Snakes
	Family Crotaphytidae	
	Gambelia wislizenii	Long-nosed leopard lizard
	Crotaphytus collaris	Collared Lizard
	Crotaphytus bicinctores	Great basin collared lizard
	Family Eublepharidae	
	Coleonyx variegatus	Western banded gecko
	Family Iguanidae	
	Dipsosaurus dorsalis	desert iguana
	Sauromalus sp.	Chuckwalla
	Family Phrynosomatidae	
	Uta stansburiana	Side-blotched lizard
	Callisaurus draconoides	Zebra-tailed lizard
	*Uma scoparia**	Mojave fringe-toed lizard
	Sceloporus magister	Desert spiny lizard
	Urosaurus graciosus	Long-tailed brush lizard
	Phrynosoma platyrhinos	Desert horned lizard
	Sceloporus magister	Desert spiny lizard
	Family Teiidae	
	Cnemidophorus tigris	Western whiptail
	Family Colubridae	
	Chionactis occipitalis	Western shovel-nosed snake
	Salvadora hexalepis	patch-nosed snake
	Masticophis flagellum	Coachwhip snake
	Family Viperidae	
	Crotalus cerastes	Sidewinder
	Crotalus mitchellii	Speckled rattlesnake
	Crotalus atrox	Western diamondback rattlesnake
Order Testundines		Turtles
	Family Testudinidae	
	Gopherus agassizii[1,2]	Desert tortoise
BIRDS		
Order Ciconiiformes		Herons, Storks, Ibises, and Relatives
	Family Cathartidae	
	Cathartes aura	Turkey vulture
Order Falconiformes		Diurnal Birds of Prey
	Family Accipitridae	
	Buteo jamaicensis	Red-tailed hawk
	Buteo swainsoni[2]	Swainson's hawk

Scientific Name		Common Name
	*Circus cyaneus**	Northern harrier
	Buteo regalis	Ferruginous hawk
	Accipiter cooperii	Coopers hawk
	Family Falconidae	
	Falco mexicanus+	Prairie falcon
	Falco sparverius	American kestrel
Order Accipitriformes		
	Family Pandionidae	
	Pandion haliaetus	Osprey
Order Galliformes		Pheasants, Grouse, Quail and Relatives
	Family Odontophoridae	
	Callipepla gambelii	Gambel's quail
Order Charadriiformes		Shorebirds, Gulls and Relatives
	Family Charadriidae	
	Charadrius vociferus	Killdeer
	Family Scolopacidae	
Order Columbiformes		Pigeons and Doves
	Family Columbidae	
	Zenaida macroura	Mourning dove
	Zenaida asiatica	White-winged dove
	Streptopelia decaocto	Eurasian collard dove
Order Caprimulgiformes		Goatsuckers and Relatives
	Family Caprimulgidae	
	Chordeiles acutipennis	Lesser nighthawk
	Phalaenoptilus nuttallii	Common poorwill
Order Cuculiformes		Cuckoos and Relatives
	Family Cuculidae	
	Geococcyx californianus	Greater roadrunner
Order Strigiformes		Owls
	Family Strigidae	
	Athene cunicularia hypugaea	Western burrowing owl
	Bubo virginianus	Great horned owl
Order Apodiformes		Hummingbirds and Swifts
	Family Trochilidae	
	Calypte costae	Costa's hummingbird
	Calypte anna	Annas hummingbird
Order Passeriformes		Song birds
	Family Sylviidae	Gnatcatchers
	Polioptila melanura	Black-tailed gnatcatcher
	Family Tyrannidae	
	Myiarchus cinerascens	Ash-throated flycatcher
	Tyrannus verticalis	Western kingbird
	Sayornis nigricans	Black phoebe
	Sayornis saya	Say's phoebe
	Family Laniidae	
	*Lanus ludovicianus**	Loggerhead shrike
	Family Corvidae	
	Corvus corax	Common raven
	Family Alaudidae	
	Eremophila alpestris actia	California horned lark
	Family Hirundinidae	
	Tachycineta thalassina	Violet-green swallow
	Family Regulidae	
	Regulus calendula	Ruby-crowned kinglet
	Family Mimidae	
	Mimus polyglottos	Northern mockingbird
	Toxostoma lecontei	Le Conte's thrasher
	Oreoscoptes montanus	Sage thrasher

Scientific Name		Common Name
	Family Ptilogonatidae	
	Phainopepla nitens	Phainopepla
	Family Parulidae	
	Dendroica coronata	Yellow-rumped warbler
	Wilsonia pusilla	Wilson's warbler
	Oporomis tolmiei	MacGillivray's warbler
	Geothlypis trichas	Common yellowthroat
	Family Emberizidae	
	Pipilo maculatus	Spotted Towhee
	Pipilo aberti	Aberts Towhee
	Amphispiza bilineata	Black-throated sparrow
	Spizella breweri	Brewer's sparrow
	Zonotrichia leucophrys	White Crowned Sparrow
	Spizella passerina	Chipping sparrow
	Family Icteridae	
	Agelaius phoeniceus	Red-winged blackbird
	Quiscalus mexicanus	Great-tailed grackle
	Euphagus cyanocephalus	Brewer's blackbird
	Family Fringillidae	
	Carpodacus mexicanus	House finch
	Family Troglodytidae	Wrens
	Salpinctes obsoletus	Rock wren
	Campylorhynchus brunneicapillus	Cactus wren
	Family Sturnidae	
	Sturnus vulgaris	European Starling
	Family Vireonidae	
	Vireo gilvus	Warbling vireo
Order Piciformes		Woodpeckers
	Picoides scalaris	Ladder-backed woodpecker
MAMMALS		
Order Lagomorpha		Rabbits, Hares, and Pikas
	Family Leporidae	
	Sylvilagus audubonii	Audubon's cottontail
	Lepus californica	Black-tailed jackrabbit
Order Rodentia		Rodents
	Family Heteromyidae	
	Dipodomys merriami	Merriam's kangaroo rat
	Chaetodipus or Perognathus sp.	pocket mouse species
	Family Scuiridae	
	Spermophilus tereticaudus	Round-tailed ground squirrel
	Ammospermophilus leucurcus	Antelope ground squirrel
	Family Cricetidae	Wood rats
	Neotoma sp.	
Order Carnivora		Carnivores
	Family Canidae	
	Vulpes macrotis arsipus	Desert kit fox
	Canis latrans	Coyote
	Urocyon cinereoargenteus	Grey fox
	Family Mephitidae	Skunks
	Mephitis mephitis	Striped skunk
Order Perissodactyla		
	Family Equidae	Burros
	Equus asinus	Wild burro

[1] Federally threatened or endangered species
[2] State threatened or endangered species
* State species of special concern
+ State special animal/CDFG watch list

ATTACHMENT E

JURISDICTIONAL DELINEATION REPORT

BLYTHE SOLAR POWER PROJECT
JURISDICTIONAL DELINEATION REPORT
FOR REGULATED WATERS OF THE UNITED STATES AND STATE
RIVERSIDE COUNTY, CALIFORNIA

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June 2010

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NOTE TO READER

The following terms will be used throughout this report:

- Desert Aquatic Resources Survey Area (DARSA): This includes the entire Project Disturbance Area, including Reconfigured Alternative Disturbance Area, transmission and utility lines,[1] substation disturbance areas, access roads, and all associated 250-foot buffers.[2]
- Project Disturbance Area: This includes the area where all construction activities (including grading and temporary staging) would occur inside and outside the Project fence line and all proposed Project components that would be constructed. Project components include solar fields, power block, linear transmission facilities, office and maintenance buildings, water treatment system, evaporation ponds, laydown area, bioremediation area, and leach fields as described in further detail below. It does not include the Colorado River Substation (CRSS), which will be permitted, constructed and operated by Southern California Edison (SCE).
- Proposed Project Study Area: This includes the proposed Project Disturbance Area plus additional areas surveyed during 2009 and 2010 for contingency in the engineering design that ultimately will not be disturbed by the Project, such as the survey area for the CRSS and associated buffers that will be permitted, constructed and operated by SCE.
- Proposed Project DARSA: This includes the Project Disturbance Area, Proposed Project Study Area, and associated 250-foot buffer.
- Reconfigured Alternative Disturbance Area: This includes the area where construction activities (including grading and temporary staging) would occur within the Reconfigured Alternative solar power blocks only and all Reconfigured Alternative components that would be built and placed.

[1] Southern California Edison (SCE) will be constructing a new substation as part of the strengthening and upgrading of its transmission network to support integration of renewable projects. The BSPP substation is planned in the area immediately west of the southern end of the BSPP transmission line. Final placement and development of the substation would be the responsibility of SCE.

[2] The associated 250-foot buffers are based upon the California Energy Commission's *Rules of Practice and Procedure: Power Plant Site Certification and Designation of Transmission Corridor Zones* (Appendix B [Information Requirements for an Application] [13][B][iii]) (CEC 2008).

- Reconfigured Alternative DARSA: This includes the disturbance area resulting from the construction of the Reconfigured Alternative solar power blocks only (which includes the solar fields and ancillary components) and associated 250-foot buffer.

I. SUMMARY

AECOM performed biological desert aquatic resources studies on behalf of Palo Verde Solar I, LLC (PVSI or Applicant) for the Blythe Solar Power Project (Project or BSPP). The Project site is on public lands managed by the Bureau of Land Management (BLM) in Riverside County, California, and the Applicant has submitted an application to BLM for a right-of-way (ROW) grant. The proposed BSSP is a solar thermal electricity- generating facility using parabolic trough technology with a nominal capacity of 1,000 megawatts (MW). The Project would be located in the southern California inland desert, approximately 2.5 miles northwest of Blythe Airport, in Riverside County, California (Figures 1 and 2 [all figures referred to herein are included in Attachment 1]). The Project solar energy facilities and associated construction and operations footprint and the Reconfigured Alternative are located within an approximate 10,076 acre Desert Aquatic Resources Survey Area (DARSA) (Figure 2).

As a component of the needed biological resources work, a formal jurisdictional delineation was conducted to obtain baseline information for potential jurisdictional waters of the United States and State occurring within the DARSA in support of the California Energy Commission (CEC)/BLM combined environmental review and permitting process. The purpose of this jurisdictional delineation is to identify boundaries and acreages of potential regulated waters of the United States and State (including wetlands) within the approximate 10,076-acre DARSA and potential regulated waters directly outside of the DARSA that are hydrologically connected "upstream" and "downstream" to delineated aquatic features occurring within the DARSA. The Applicant is requesting a final jurisdictional determination (JD) of isolated waters (nonjurisdictional waters of the United States) from the U.S. Army Corps of Engineers (USACE) and U.S. Environmental Protection Agency (USEPA) (Attachment 2),[3] and verification of the location, type, size, and extent of jurisdictional waters of the State under regulatory administration by the California Department of Fish and Game (CDFG) and Regional Water Quality Control Board (RWQCB).

This jurisdictional delineation report (JDR) summarizes the methodologies employed in conducting a formal jurisdictional delineation for waters of the United States and State under the regulatory administration of the USACE and the CDFG, respectively, the results of the fieldwork, and the existing conditions of the surveyed portions of the DARSA and relevant adjacent lands where potential jurisdictional waters occur. Based on the results of the field delineation it was determined that there are no potential jurisdictional waters of the United States

[3] Utilizing an Approved JD Form (see below).

(0.0 acre)[4] and approximately 454.94 acres of potential jurisdictional waters of the State within the DARSA. Of the approximately 454.94 acres of waters of the State occurring within the DARSA (composed of approximately 444.13 acres of desert dry wash woodland and 10.81 acres of unvegetated ephemeral dry wash), approximately 350.88 acres (composed of approximately 341.76 acres of desert dry wash woodland, and 9.12 acres of unvegetated ephemeral dry wash[5]) occur within the Proposed Project DARSA. Desert aquatic features occurring outside the Proposed Project DARSA that exhibit hydrological connectivity to other desert aquatic features occurring within the larger DARSA have been delineated to identify potential offsite desert aquatic features that may be indirectly impacted by the Proposed Project.[6]

II. INTRODUCTION

A. Proposed Project Location

The BSPP is located in the Palo Verde Mesa east of the McCoy Mountains in eastern Riverside County, California, approximately 8 miles east of Blythe, California, and approximately 2 miles north of Interstate 10 (I-10). Elevation ranges from approximately 200 to 650 feet above sea level (USGS 1975, 1983) (Figure 2).

B. Description of Proposed Project

PVSI is proposing to construct the BSPP, a nominal 1,000-MW commercial solar thermal power-generating facility (Figure 3). The BSPP would be located on a 9,405-acre ROW owned by the Federal government and administered by BLM. Use of the Federal land would involve issuance of an ROW grant to the Applicant by BLM. The total Project Disturbance Area would be approximately 7,025 acres (Figure 4). The Project would use solar parabolic trough technology to generate electricity. With this technology, arrays of parabolic mirrors collect heat

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4 Final acreages of jurisdictional waters of the United States will be based upon the Jurisdictional Determination (JD) process per the March 30, 2007, United States Army Corps of Engineers Jurisdictional Determination Form Guidebook; the June 5, 2007, Approved JD Form; the June 5, 2007, Joint Guidance Memorandum; the December 2, 2008, Guidance Memorandum; or Regulatory Guidance Letter (RGL) 08-02 (if RGL 08-02 is deemed applicable and appropriate [i.e., the permit applicant, or other "affected party" can decline to request and obtain an Approved JD and elect to use a Preliminary JD instead]).

5 Of the approximately 454.94 acres of delineated desert aquatic features, only the approximately 444.13 acres of desert dry wash woodland and 10.81 acres of unvegetated ephemeral dry wash will be considered as meeting the definitions of potential jurisdictional waters of the United States for the purposes of conducting a jurisdictional determination (see below).

6 Most likely, upstream washes would not be directly or indirectly impacted by the BSPP. Downstream waters containing wash-dependent vegetation would likely be indirectly impacted by the rerouting of the onsite washes; the Blythe Biological Resources Technical Report (AECOM 2010) will evaluate these impacts.

energy from the sun and refocus the radiation on a receiver tube located at the focal point of the parabola. A heat transfer fluid (HTF) is heated to high temperature (approximately 750 degrees Fahrenheit [°F]) as it circulates through the receiver tubes. The heated HTF is then piped through a series of heat exchangers where it releases its stored heat to generate high-pressure steam. The steam is then fed to a traditional steam turbine generator where electricity is produced.

The Project would have a nominal output of 1,000 MW, consisting of four independent 250-MW power plants (Units 1, 2, 3, and 4). The units would be developed in phases, with construction scheduled to begin in late 2010 on the first unit, which would come on line in mid-2013. Each power block unit would have its own solar field, composed of piping loops arranged in parallel groups, and its own power block, centrally located within the solar field. Each power block would have its own HTF pumping and freeze-protection system, solar steam generator, steam turbine generator, an air-cooled condenser for cooling, transmission lines and related electrical system, and auxiliary equipment (e.g., water treatment system, emergency generators, and evaporation ponds). Major project components are identified below.

The Project would require a new transmission line. Transmission line features (e.g., crossing structures, pole pads, crane pads, pull sites, splice sites, spur roads, and an access road) would be located along an 8-mile transmission line corridor that extends to a point south of I-10 and then turns west and extends to the proposed Colorado River substation. The transmission line and utility lines share the same corridor except where the transmission line jogs west to avoid private property on the north side of I-10 as shown in Figure 3. The 2.3-mile utility corridor extends south to a point just north of I-10 then extends west. The transmission line will be connected to the Colorado River Substation that Southern California Edison (SCE) will be constructing as part of the strengthening and upgrading of its transmission network to support integration of renewable projects. Final placement and development of the substation would be the responsibility of the utility (e.g., SCE) (Figure 3).

Access to the BSPP would be on a new road heading north from the frontage road along I-10. Only a small portion of the overall Project Disturbance Area would be paved, primarily the site access road, the service roads to the power blocks, and 6 acres of each of the 18-acre power blocks. The solar fields would remain unpaved and without a gravel surface to prevent mirror damage. The Project solar fields and support facilities perimeter would be secured with chain-link metal-fabric security fencing and controlled access gates. In addition, a 30-foot tall wind fence will be located along the eastern and western edges of the facility.

Major Project Components

The major components and features of the Proposed Project (Figure 3) include:

- Solar Field and Power Block Unit #1 (northeast);
- Solar Field and Power Block Unit #2 (northwest);
- Solar Field and Power Block Unit #3 (southwest);
- Solar Field and Power Block Unit #4 (southeast);
- Access road including upgraded portion of Black Rock Road to onsite office;
- Office and parking;
- Land treatment unit (LTU) for bioremediation/land farming of HTF-contaminated soil;
- Warehouse/maintenance building, assembly hall, and laydown area;
- Onsite transmission facilities, including central internal switchyard;
- Natural gas pipeline;
- Telecommunications lines;
- Evaporation ponds;
- Dry wash rerouting; and
- Groundwater wells used for water supply.

Major components of each power block include:

- Steam generation heat exchangers;
- HTF overflow and expansion vessels;
- One auxiliary boiler;
- One steam turbine-generator (STG);
- One generator step up transformer (GSU);
- Air cooled condenser (ACC);
- One wet cooling tower for ancillary equipment;
- Water filter system and clarifier system
- Combination firewater/clarified water tank;
- Potable water system
- Demineralized water system
- Demineralized water tank
- High efficiency reverse osmosis (HERO) waste water recovery system
- Recovered water surge tank
- Evaporation waste stream pond(s)

- Water, natural gas, and HTF pipelines exiting the power block;
- Operations and maintenance buildings; and
- Transmission and telecommunications lines exiting the power block.

PVSI has made various minor modifications to the BSPP since the AFC was submitted in August 2009. Some of these minor changes are not reflected in the March 2010 Staff Assessment/Draft Environmental Impact Statement (SA/DEIS) and reflect further definition of linear facilities and other changes required as a result of the Applicant's discussions with staff, other regulatory agencies, and the engineering team. New transmission line locations and associated buffers (as part of the Reconfigured Alternative discussed below), as well as additional locations added due to minor Project changes, were surveyed in spring 2010 and are the included in the analysis of this report.

Changes to the Proposed Project were submitted to the CEC on April 19, 2010 and include:

- Removal of the four gas-fired HTF heaters (one per Unit) (within AFC Disturbance Area);
- Addition of an onsite concrete batch plant during construction (within AFC Disturbance Area);
- Addition of evaporation ponds to process industrial wastewater flows (within AFC Disturbance Area);
- Revision to construction water requirements, number of groundwater wells, and construction water storage approach (within AFC Disturbance Area);
- Finalization of the gen-tie line route to the SCE Colorado River Substation (portion of route outside of AFC Disturbance Area) (Figure 2);
- Clarification on the removal of the existing onsite (abandoned) natural gas pipeline;
- Changes to layout of Project facilities (within AFC Disturbance Area);
- Revisions to Project drainage system construction sequencing;
- Clarification on the paving of Black Rock Road (roadway section to be improved extends for a total length of approximately 3,500 feet; outside of AFC Disturbance Area);
- Addition of a temporary construction power line from offsite (outside of AFC Disturbance Area);

- Refinement of the daily construction schedule;
- Finalization of the telecommunications line (outside AFC Disturbance Area););
- Revised list of water treatment and hazardous materials chemicals; and
- Addition of an onsite fuel depot (within AFC Disturbance Area).

Reconfigured Alternative

At the request of CEC, this report presents findings and analysis for the Reconfigured Alternative that was analyzed in the SA/DEIS. The Reconfigured Alternative would be a nominal 1,000-MW solar facility, similar to the Proposed Project. Three of the Project solar power blocks (Units 1, 2, and 4) would remain at their locations. These include the two northern solar fields and the southeastern solar field (Figure 5). Unit 3 (the southwestern solar field) would be relocated approximately 0.8 mile south of its location. Approximately 480 acres of the Reconfigured Alternative (a portion of Unit 3) would be outside of the ROW application area, but the alternative would remain entirely within BLM managed lands.

It is important to note that the Reconfigured Alternative is not a complete engineering design. The Reconfigured Alternative Disturbance Area provides sufficient area for construction of four solar power blocks (and the components outlined above) only. It does not include areas for access roads, staging, office and management facilities, staging area, land treatment unit, dry wash rerouting, water supply, transmission lines, or a substation. The Reconfigured Alternative Disturbance Area[7] would be approximately 5,548 acres (Figure 5). The Reconfigured Alternative Disturbance Area encompasses the disturbance caused by construction of the solar power blocks and solar fields only; it does not include shared facilities and linears.

The major components and features of the proposed Reconfigured Alternative include:

- Solar Field and Power Block Unit #1 (northeast);
- Solar Field and Power Block Unit #2 (northwest);
- Solar Field and Power Block Unit #3 (southwest); and
- Solar Field and Power Block Unit #4 (southeast).

[7] The Reconfigured Alternative desert aquatic resources survey area encompasses the disturbance caused by construction of the solar power blocks only.

Most of the Reconfigured Alternative DARSA overlaps with the Proposed Project DARSA and was surveyed during 2009. Unsurveyed portions of the Reconfigured Alternative DARSA occurring outside of the Proposed Project DARSA were surveyed in spring 2010 and the results are included in the analysis of this report.

III. REGULATORY FRAMEWORK

Jurisdictional waters (including wetlands and other aquatic environments/habitats) occurring within the United States and California are regulated under the following Federal and State laws.

A. Federal Regulations

Pursuant to Section 404 of the Clean Water Act (CWA), USACE is authorized to regulate any activity that would result in the discharge of dredged or fill material into jurisdictional waters of the United States, which include those waters listed in 33 Code of Federal Regulations (CFR) 328 (Definitions of Waters of the United States). USACE, with oversight by USEPA, has the principal authority to issue CWA Section 404 Permits.

Pursuant to Section 401 of the CWA, RWQCB certifies that the discharge will comply with State water quality standards. RWQCB, as delegated by USEPA, has the principal authority to issue a CWA Section 401 water quality certification or waiver.

B. State Regulations

Pursuant to Section 1600 *et seq*. of the California Fish and Game Code (CFGC), CDFG is authorized to regulate any activity that would alter the flow, bed, channel, or bank of streams and lakes. Jurisdictional waters of the State include the channel bed and bank of a lake, river, or stream. In practice, CDFG usually extends its jurisdictional limit to the top of the bank of a stream or lake, or to the continuous outer edge of its riparian extent, whichever is wider.

Pursuant to Section 13000 *et seq*. of the California Water Code (CWC) (the 1969 Porter-Cologne Water Quality Control Act [Porter-Cologne]), the RWQCB is authorized to regulate activity that would result in discharges of waste and fill material to waters of the State (including saline waters) and "isolated" waters and/or wetlands (e.g., vernal pools and seeps) and groundwater within the boundaries of the State. The RWQCB also adopts and implements water quality control plans (basin plans) that recognize and are designed to maintain the unique characteristics

of each region with regard to natural water quality, actual and potential beneficial uses, maintaining water quality, and addressing the water quality problems of that region.[8]

Designated beneficial uses of State waters that may be protected against quality degradation include, but are not limited to, preservation and enhancement of fish, wildlife, designated biological habitats of special significance and other aquatic resources or preserves.[9]

C. Purpose of Assessment

The purpose of performing a formal jurisdictional delineation is to identify, verify, and determine potential boundaries, acreages, and types of regulated waters of the United States and State (including wetlands) occurring within the approximate 7,025-acre Project Disturbance Area, over which USACE,[10] CDFG, and RWQCB will assert jurisdiction.[11] The BSPP has the potential to result in the loss of jurisdictional waters of the State. This JDR is intended to support and provide agency documentation in the process of obtaining the following:

1. USACE determination of regulatory requirements and, if required, authorization under Section 404 of the CWA.
2. RWQCB certification of compliance under Section 401 of the CWA, if required.[12]
3. CDFG authorization under Section 1600 *et seq*. of the CFGC.
4. RWQCB issuance of Waste Discharge Requirements (WDR) or waiver under Porter-Cologne.

IV. PROPOSED PROJECT SETTING

In addition to the delineations of waters of the United States and State described in this report, AECOM conducted plant community mapping and other biological surveys within the Project Disturbance Area and ROW (EDAW 2009a, AECOM 2010). A summary of the plant

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8 CWC Section 13050(j).

9 CWC Section 13050(f). Specific to species, uses of water that support habitats necessary, at least in part, for the survival of Federal or State listed species; and the migration, reproduction, and early development of aquatic species are also evaluated under the Basin Plan (RWQCB 1994).

10 Verification of the presence or absence of Federal waters by USACE will be based on the findings in this JDR and the JD process (Attachment 2).

11 Federal and State jurisdictions may overlap but will remain distinct for authorization/permitting requirements.

12 If it is determined by the USACE that CWA Section 404 authorization is required).

community mapping parameters relevant to the presence and extent of potential jurisdictional wetlands (vegetation, hydrology, and soils) is provided below.

A. Xeric Riparian Plant Communities

The field delineation used the Holland Code Classification System for vegetation communities (Holland 1986), and applied the comparable Sawyer and Keeler-Wolf Series, as defined in *The Manual of California Vegetation* (1995) and CDFG *List of California Terrestrial Natural Communities Recognized by the California Natural Diversity Database* (CDFG 2003) when the Holland Code Classification System was determined inadequate to accurately describe selected vegetation communities occurring within and outside the DARSA. This approach was used to identify xeric riparian vegetation associated with all washes occurring within the DARSA (Table 1). Only wash-dependent plant species were mapped (Table 2). Where vegetation contains a mixture of upland and wash-dependent indicator species from two or more Holland vegetation communities and/or Sawyer and Keeler-Wolf vegetation associations, the indicator species that appears with the greatest vegetation coverage (absolute dominance based on percent cover) was used to identify the vegetation community. The minimum mapping unit (MMU) for xeric riparian vegetation communities used for the field delineation was 0.10 acre.

Table 1
Xeric Riparian Plant Communities Occurring within the Proposed Project DARSA [a]

Xeric Riparian Plant Communities	Acres			
	Inside Proposed Project DARSA	Directly Outside Proposed Project DARSA		Total Survey Area
		Hydrologically Connected Upstream	Hydrologically Connected Downstream[b]	
Desert Dry Wash Woodland (Holland Code 62200)	197.04	7.22	137.49	341.76
Creosote Bush-Big Galleta (Sawyer and Keeler-Wolf Code 33.010.13[c])	365.59	0.61	44.60	410.81
Grand Total	**562.63**	**7.83**	**182.09**	**752.57**

[a] Acreage of the plant communities occurring within the survey area was determined by using the Geographic Information System (GIS) program ArcGIS. All acreages are rounded to the nearest tenth.

[b] Several areas outside the disturbance area were delineated to facilitate impacts analysis. Specifically, downstream waters beyond the disturbance area may potentially be indirectly impacted by the rerouting of desert washes within the disturbance area.

[c] Creosote Bush-Big Galleta is considered a "Special Community Type" by CDFG. Special Community Types are either known or believed to be of high priority for inventory in California Natural Diversity Database (CNDDB).

Table 2
Wash-Dependent Plant Species Observed within the Survey Area[a]

Scientific Name	Common Name	Region 0 (California) Indicator Status[a]
Tree Species		
Cercidium floridum ssp. *floridum*	blue palo verde	Not Listed (NL)[b]
Olneya tesota	ironwood	NL
Psorothamnus spinosus	smoke tree	NL
Shrub Species		
Acacia greggii	catclaw	Facultative Upland (FACU)[c]
Hyptis emoryi	desert lavender	NL
Prosopis glandulosa	honey mesquite	NL
Senna armata	spiny senna	NL
Herbaceous Species		
Brandegea bigelovii	desert starvine	NL
Pleuraphis rigida	big galleta grass	NL

[a] Based on National List of Vascular Plant Species That Occur in Wetlands (Reed 1988).
[b] NL status is assigned to a plant species if does not occur in wetlands in any region and is not on the 1988 National List.
[c] FACU plant species usually occur in nonwetlands (estimated probability 67 to 99%) but occasionally are found in wetlands (estimated probability 1 to 33%) under natural conditions in the region specified.

The plant community mapping for the Project Disturbance Area is provided in Figure 6. Although the xeric riparian, upland, and other cover types are displayed in Figure 6, the xeric riparian plant communities are the focus of the following discussion. The one xeric riparian vegetation community occurring within the disturbance area has been identified as desert dry wash woodland (Holland Code 62200). Although desert dry wash woodland is a nonhydrophytic (nonwetland) plant community, it is still relevant to potential jurisdictional waters (primarily based on, but not limited to, ecological function and regulatory definitions), and thus is discussed in this JDR.

Desert Dry Wash Woodland (Holland Code 62200)

Desert dry wash woodland is similar to Mojave wash scrub (Holland Code 34250) and Mojave desert wash scrub (Holland Code 63700). Desert dry wash woodland is distributed along the larger drainages of the lower Mojave Desert and more generally through the Colorado Desert. This vegetation community occupies dry, sandy, or gravelly washes and arroyos of the lower Mojave and Colorado deserts, largely in frost-free areas. These washes and arroyos typically have braided channels that substantially rearrange with every surface flow event. Desert dry wash woodland is typically an open vegetation community; however, canopy development and density are variable and may depend on water supply. It is drought-deciduous, microphyllous

riparian thorn scrub woodland that can range between 15 and 60 feet tall, dominated by any of several fabaceous trees (Holland 1986; CDFG 1988).

This vegetation community occupies the major washes that traverse the disturbance area and is dominated by an open overstory of blue palo verde, honey mesquite, ironwood, and smoke tree, with a scattered understory of catclaw acacia, honey mesquite, big galleta grass, desert starvine, and desert lavender primarily intermixed with creosote bush (*Larrea tridentata*). Desert dry wash woodland is most developed in the major washes located within the southwest portion of the disturbance area where channel development is most pronounced and water supply likely more abundant from the surrounding mountains (see below). Within the southeastern portion of the disturbance area, as the washes become shallower and eventually abate into the landscape, desert dry wash woodland declines in species diversity and occurrence.

Creosote Bush-Big Galleta Grass (Sawyer and Keeler-Wolf Code 33.010.13)

Creosote bush-big galleta grass vegetation association is a component of Sawyer and Keeler-Wolf's Big Galleta Series 33. The creosote bush-big galleta association occurs as an understory component in the washes within the dry desert wash woodland and continues along swales within the larger Sonoran creosote bush scrub community throughout the survey area. Dominant and indicator plants of this community include creosote bush, big galleta grass, and cheesebush (*Hymenoclea salsola*). Occasional associates found within this community include brownplume wire lettuce (*Stephanomeria pauciflora* var. *pauciflora*), Utah cynanchum (*Cynanchum utahense*), Hartweg's twinevine (*Sarcostemma cynanchoides* ssp. *hartwegii*), and trailing townula (*Sarcostemma hirtellum*). The creosote bush-big galleta association is considered a Special Community Type by CDFG (Sawyer and Keeler-Wolf 1995; CDFG 2003, 2007; USGS 2004).

B. <u>Hydrology</u>

The DARSA occurs within the Imperial Reservoir Watershed (Hydrologic Unit Code [HUC] 15030104) and is located within the RWQCB Colorado River Basin Region 7, Colorado River Hydrologic Basin Planning Area, Colorado Hydrologic Unit (715.00), Palo Verde Hydrologic Area (715.40) (Figure 7). The rainfall pattern is bimodal with a rainy season in both summer and winter (December through March and July through September [the commonly wetter of the two]). Average annual rainfall for the DARSA (Palo Verde Hydrologic Area) is approximately 3.6 inches (Table 3) (NOAA 2009a).

Table 3
Survey Area Annual Precipitation Data from Base Weather Station[a]

Time Period	Historical Average[b] (inches)	Past Year[b] (inches)
June	0.02	0.00
July	0.24	0.27
August	0.63	0.15
September	0.36	0.06
October	0.26	0.00
November	0.20	0.24
December	0.40	0.65
January	0.47	0.02
February	0.43	0.43
March	0.36	0.00
April	0.16	0.00
May	0.02	0.03
Annual Total	**3.56**	**1.85**

[a] Western Regional Climate Center 2008.
[b] National Oceanic & Atmospheric Administration, National Climatic Data Center 2008, 2009b, 2009c.

Surface hydrology of the DARSA is influenced by the surrounding mountain ranges during storm events. The DARSA is located in the Palo Verde Mesa and is encompassed by the McCoy Mountains located directly west, the Little Maria Mountains located approximately 6.5 miles to the north, and the Big Maria Mountains located approximately 7.5 miles to the northeast. The stormwater flow pattern for the DARSA is from the higher elevations west in the McCoy Mountains to the lower elevations east into the Palo Verde Mesa (Figure 8). Virtually all surface hydrology occurring within the DARSA is from stormwater runoff originating in unnamed ephemeral washes, west of the disturbance area, flowing eastward from the McCoy Mountains, which collectively develop into a component of a large alluvial fan that generally comprises the Palo Verde Mesa (Figure 6).

The closest major watercourse to the DARSA is the McCoy Wash, which is a large ephemeral wash that drains 210 square miles of the Palo Verde Mesa (including the McCoy Mountains, Little Maria Mountains, and Big Maria Mountains). The McCoy Wash is located outside of the DARSA and the ephemeral washes that traverse the DARSA from the McCoy Mountains in a west-to-east orientation abate into the landscape prior to any surface hydrological connection with the McCoy Wash.

Ephemeral stream channels are commonly linear features that are straight to slightly meandering (Whitford 2002; High and Picard 1973). As they flow eastward from the base of the McCoy Mountains, the ephemeral channels generally convert from sparsely vegetated slightly meandering to an anastomosed morphology, presented as semi-braided beds with regular incised

compound channels and multiple relic channels. Compound channels are considered the most common channel types in arid regions and are characterized by a single, low-flow meandering channel inset into a wider braided channel network (Tooth 2000; Graf 1988). These channels are highly susceptible to widening and avulsions (i.e., rapid changes in channel position and/or channel relocation) during moderate to high discharges, reestablishing a low-flow channel during subsequent low flows (Lichvar and McColley 2008).

The ephemeral washes occurring within the DARSA present themselves as micro-floodplains with compound channels, which is a common arid stream system (Lichvar and McColley 2008). With any compound/anastomosing ephemeral stream system in arid regions, the riparian corridor can be populated and lined with adapted riparian vegetation, unvegetated areas such as recently created swales and terraces (interfluves), or a mosaic of these types (Bendix and Hupp 2000). Within the DARSA extended portions, the ephemeral drainage features are composed of very shallow compound channels with noncohesive sandy banks. The sandy substrate is composed of entisols and presents a high infiltration rate (see Section C [Soils] below). Surface hydrology can vary from perennial to intermittent and, after a flooding event, water tables can drop quickly to low levels due to the permeability of the sandy substrate (Environmental Laboratory 2008).

As rainfall in arid regions is the primary source of water for the majority of the rivers and streams existing within these climactic regions, river and stream complexes are intermittent or ephemeral in character, flowing only during storm events and remaining dry for most of the year. As a result, the analysis of streamflow and changes in compound channel morphology in arid fluvial systems emphasizes flood events (Graf 1988). Flood events and the resulting channel avulsion that occur within arid river systems generally consist of four types:

1. Flash floods,
2. Single peak events,
3. Multiple peak events, and
4. Seasonal floods.

These flood events are partly scale dependent, with flash floods occurring on smaller stream systems (tributaries) and seasonal floods characteristic of large through-flowing rivers (Graf 1988). In arid fluvial systems, flood events are the physical factors that convert usually single meandering channels to a compound/anastomosing morphology (semi-braided [with regular incised channels and multiple relic channels]) (Dunne and Leopold 1978). In several arid regions, large storm events have been responsible for changing the dominant channel

configuration from meandering to braided in watersheds of varying sizes (Bendix and Hupp 2000).

Because compound channel fluvial systems, such as the ephemeral washes occurring within the DARSA, are subject to very wide fluctuations in discharges over a short period of time, their channels can frequently change configuration to accommodate large variations in surface flow as a result of storm events. As a result, arid fluvial systems usually exhibit long periods of little morphologic change interspersed with short-term dramatic changes in channel configuration. Therefore, arid stream geometry is more likely to be influenced strongly by a large event of low recurrence frequency (Allen 1999). The ephemeral washes do not support wetland hydrology because, outside of (remote) flooding events, the hydrology for the ephemeral washes occurring within the DARSA is generally predictable (AECOM 2009a) (Figure 9). The DARSA is located within an area that presents possible, but undetermined, flood hazards (FEMA Flood Zone Designation D) (FEMA 2009).

C. Soils

The Arid West region is dominated by watersheds that have a high frequency of intermittent and ephemeral dry washes, such that many aquatic resources within the watersheds actually lack the three characteristic features of a wetland (see below). Due to arid climatic conditions and the uneven distribution of precipitation events over time, hydric soils rarely develop (Boettinger 1997; Lichvar and Field 2007). No detailed soil survey exists for the DARSA (NRCS 2009a, 2009b). The California Soil Resources Lab mapped three soil complexes occurring within the disturbance area (UC Davis 2009a):

1. Gunsight-Rillito-Chuckawalla,
2. Cherioni-Hyder-Cipriano, and
3. Aco-Rositas-Carrizo

The above three soil complexes are generally mapped having a shared boundary near the southern portion of the DARSA. The Gunsight-Rillito-Chuckawalla complex is located in the western portion of the DARSA, the Cherioni-Hyder-Cipriano complex is located within the central portion of the DARSA, and the Aco-Rositas-Carrizo complex is located in the eastern portion of the DARSA (Figure 10). Of these three complexes, Gunsight-Rillito-Chuckawalla and Aco-Rositas-Carrizo contain several soils that are listed on the National Hydric Soils List (NRCS 2009c).

Only soils that are listed as hydric have diagnostic hydric properties and/or features, have hydric inclusions, meet the criteria and/or definition for a hydric soil, or have the potential for being hydric by definition are addressed herein. The National Technical Committee for Hydric Soils (NTCHS) defines a hydric soil as "a soil that formed under conditions of saturation, flooding or ponding long enough during the growing season to develop anaerobic conditions in the upper part" (NRCS 2009b).[13] The NTCHS definition identifies general soil properties that are associated with wetness. Additionally, specific criteria that identify those estimated soil properties unique to hydric soils have been established by NTCHS (1995).[14] Therefore, hydric soils are either saturated or inundated long enough during the growing season to support the growth and reproduction of hydrophytic vegetation.

Hydric soil definitions and NTCHS approved hydric soil criteria are used to generate hydric soil lists (Environmental Laboratory 2008). The National Hydric Soils List (NRCS 2009c), primarily used as an offsite assessment tool, contains a listing of soils that have a probability of being hydric. Hydric soil indicators are primarily morphological indicators used for field identification of hydric soils and/or soils meeting the hydric soil definition. These hydric soil indicators are a subset of the NTCHS *Field Indicators of Hydric Soils in the United States: A Guide for Identifying and Delineating Hydric Soils, Version 6.0* (USDA 2006). Hydric soil indicators are not intended to replace or relieve the requirements contained in the definition of a hydric soil. Therefore, a soil that meets the definition and/or criteria of hydric can be considered hydric whether or not it exhibits diagnostic field indicators (e.g., the presence of mottles or gleying [redoximorphic features]) at the point of subsurface investigation.

All soils listed as hydric by the National Hydric Soils List (NRCS 2009c) occurring within the DARSA are within the entisol soil order. Entisols are young soils primarily originating from sediments and alluvium that show little alteration of the parent material from which they were derived, and that exhibit little pedogenesis (soil formation process) (Brady 1990). Since entisols are associated with fluvial processes, they are by nature dynamic and do not have the ability to develop buried soil horizons, which in turn contribute to *in situ* development of redoximorphic features when conditions are hydric over the appropriate temporal frame.

Although not mapped in detail, three soil series, listed as hydric by the National Hydric Soils List (NRCS 2009c), are known to occur within the western, central, and southern portions of the DARSA. An additional five soils occurring within the disturbance area not listed as hydric but classified within the entisol soil order are also discussed in this JDR, as they have the strong

[13] FR 59(133): 35680-35681 (July 13, 1994).
[14] FR 60(37): 10349 (February 24, 1995).

potential to be considered as hydric. The eight entisols occurring within the DARSA are typically associated with drainage features and are described below.

Aco Soil Series

The Aco series are coarse-loamy, mixed, superactive, hyperthermic Typic Haplocalcids. They consist of very deep, well to somewhat excessively drained soils that formed in mixed alluvium on terraces slightly above the floodplain. A typical Aco pedon is composed of sandy loam populated by native shrubs. Slopes for this soil are 0 to 8 percent. The mean annual precipitation for this soil is approximately 4 inches (NRCS 2009a, 2009d).

Beeline Soil Series

The Beeline series are loamy, mixed, superactive, calcareous, hyperthermic, shallow Typic Torriorthents. They consist of shallow and very shallow, well-drained soils that formed in mixed alluvium. Beeline soils are on fan terraces and hillslopes. A typical Beeline pedon is composed of very gravelly sandy loam rangeland. Slopes for this soil range from 3 to 45 percent. The mean annual precipitation for this soil approximately 9 inches (NRCS 2009a, 2009d).

Carrizo Soil Series

The Carrizo series are sandy-skeletal, mixed, hyperthermic Typic Torriorthents. They consist of very deep, excessively drained soils formed in mixed alluvium. Carrizo soils are on floodplains, alluvial fans, fan piedmonts, and bolson floors. A typical Carrizo pedon is composed of extremely gravelly sand rangeland. The slopes for this soil range from 0 to 15 percent. The mean annual precipitation for this soil is approximately 5 inches. Carrizo very gravelly sand, 0 to 9 percent slopes, is on the National List of Hydric Soils (NRCS 2009a, 2009c, 2009d).

Carsitas Soil Series

The Carsitas series are mixed, hyperthermic Typic Torripsamments. They consist of excessively drained, rapidly permeable, nearly level to strongly sloping soils and are on alluvial fans, moderately steep valley fills, and dissected remnants of alluvial fans. A typical Carsitas pedon is composed of gravelly sand populated by desert shrubs. The mean annual precipitation for this soil is less than 5 inches. Carsitas gravelly sand, 0 to 9 percent slopes; Carsitas gravelly sand, 9 to 30 percent slopes; and Carsitas cobbly sand, 2 to 9 percent slopes, are on the National List of Hydric Soils (NRCS 2009a, 2009c, 2009d).

Gilman Soil Series

The Gilman series are coarse-loamy, mixed, superactive, calcareous, hyperthermic Typic Torrifluvents. They consist of very deep, well-drained soils that formed in stratified stream alluvium. Gilman soils are on floodplains and alluvial fans. A typical Gilman pedon is composed of cultivated loam. Slopes for this soil range from 0 to 3 percent. The mean annual precipitation for this soil is approximately 7 inches (NRCS 2009a, 2009d).

Hyder Soil Series

The Hyder series are loamy-skeletal, mixed, superactive, calcareous, hyperthermic Lithic Torriorthents. They consist of very shallow and shallow, somewhat excessively drained soils that formed in alluvium from rhyolite and related volcanic rocks. Hyder soils are on mountains and hills. A typical Hyder pedon is composed of extremely gravelly sandy loam rangeland. Slopes for this soil range between 1 to 70 percent. The mean annual precipitation for this soil is approximately 7 inches (NRCS 2009a, 2009d).

Quilotosa Soil Series

The Quilotosa series are Loamy-skeletal, mixed, superactive, calcareous, hyperthermic Lithic Torriorthents. They consist of very shallow and shallow, somewhat excessively drained soils that formed from granitic and metamorphic rocks. Quilotosa soils are on hills and mountains. A typical Quilotosa pedon is composed of extremely gravelly coarse sandy loam rangeland. Slopes for this soil range between 3 to 65 percent. The mean annual precipitation for this soil is approximately 7 inches (NRCS 2009a, 2009d).

Rositas Soil Series

The Rositas series are mixed, hyperthermic Typic Torripsamments. They consist of very deep, somewhat excessively drained soils formed in sandy eolian material. Rositas soils are on dunes and sand sheets. A typical Rositas pedon is composed of fine sand rangeland. Slope for this soil ranges from 0 to 30 percent with hummocky or dune micro relief. The mean annual precipitation for this soil is approximately 4 inches (NRCS 2009c). Rositas silty clay loam, wet, 0 to 2 percent slopes is on the National List of Hydric Soils (NRCS 2009a, 2009c, 2009d).

V. METHODOLOGY

This jurisdictional delineation applied presurvey investigations and field surveys to determine the presence (type, area, and extent) or absence of jurisdictional waters of the United States and State.

A. Presurvey Investigations

Prior to conducting the field delineation, AECOM ecologist Joshua Zinn reviewed and identified areas with topographical configurations and vegetative signatures occurring within the DARSA that may suggest the potential or presence of jurisdictional waters. This information was evaluated by consulting the following available sources:

- 7.5' U.S. Geologic Survey (USGS) McCoy Wash (1975), McCoy Peak (1983), Ripley (1975), and Roosevelt Mine topographic quadrangles,
- 2005 Aerial Maps of the Biological Resources Study Area (BRSA) (USDA NAIP 2009),
- The National Wetlands Inventory (NWI) Interactive Wetlands Mapper (USFWS 2009),
- The California Environmental Resources Evaluation System California Wetlands Information System Wetland Databases and Inventories (CERES 2009),
- California Online Soil Survey Manuscripts (NRCS 2009a),
- The Natural Resource Conservation Service Web Soil Survey (NRCS 2009b),
- The National List of Hydric Soils (NRCS 2009c),
- The California Soil Resource Lab (U.C. Davis 2009a),
- The Information Center for the Environment (ICE) (U.C. Davis 2009b),
- The California Watershed Network (CWN 2009),
- The California Watershed Portal (CalEPA 2009),
- The Office of Water Programs Water Quality Planning Tool (CSU Sacramento 2009),
- The Digital Watershed (USEPA 2009a), and
- The National Weather Service Climate Office (NOAA 2009a).

B. Field Survey

AECOM ecologists Jason Phillips, Lindsay Teunis, and Joshua Zinn, and AECOM Environment ecologist Jessica Wilson conducted field assessments and surveys for 18 days (55 person-days) from March 18 through March 27, 2009; October 7, 2009; November 5–6, 2009; and April 5–8 and 10, 2010 (Table 4), to formally delineate all potential jurisdictional waters of the United States[15] and State occurring within the DARSA.

Table 4
Survey Dates and Personnel Conducting Jurisdictional Delineations

Date	Survey Personnel	Survey Activity
03-18-2009	Jason Phillips, Lindsay Teunis, Jessica Wilson, and Joshua Zinn	Site reconnaissance and field delineation
03-19-2009	Jason Phillips, Lindsay Teunis, Jessica Wilson, and Joshua Zinn	Site reconnaissance and field delineation
03-20-2009	Jason Phillips, Lindsay Teunis, Jessica Wilson, and Joshua Zinn	Field delineation and vegetation subsampling
03-21-2009	Jason Phillips, Lindsay Teunis, Jessica Wilson, and Joshua Zinn	Field delineation and vegetation subsampling
03-22-2009	Jason Phillips, Lindsay Teunis, Jessica Wilson, and Joshua Zinn	Field delineation and vegetation subsampling
03-23-2009	Jason Phillips, Lindsay Teunis, Jessica Wilson, and Joshua Zinn	Field delineation and vegetation subsampling
03-24-2009	Jason Phillips, Lindsay Teunis, Jessica Wilson, and Joshua Zinn	Field delineation and vegetation subsampling
03-25-2009	Jason Phillips, Lindsay Teunis, Jessica Wilson, and Joshua Zinn	Field delineation and vegetation subsampling
03-26-2009	Jason Phillips, Lindsay Teunis, Jessica Wilson, and Joshua Zinn	Field delineation and groundtruthing features
03-27-2009	Jason Phillips, Lindsay Teunis, Jessica Wilson, and Joshua Zinn	Field delineation and groundtruthing features
10-07-2009	Joshua Zinn	Field delineation and groundtruthing features for the transmission line corridor and substation disturbance areas
11-05-2009	Jason Phillips and Joshua Zinn	Supplemental field delineation and groundtruthing features post CDFG and CEC field confirmation
11-06-2009	Jason Phillips and Joshua Zinn	Supplemental field delineation and groundtruthing features post CDFG and CEC field confirmation
04-05-2010	Jason Phillips and Joshua Zinn	Site reconnaissance and field delineation for reconfigured alternative
04-06-2010	Jason Phillips and Joshua Zinn	Field delineation and groundtruthing features for reconfigured alternative
04-07-2010	Jason Phillips and Joshua Zinn	Field delineation and groundtruthing features for reconfigured alternative
04-08-2010	Jason Phillips and Joshua Zinn	Field delineation and groundtruthing features for reconfigured alternative
04-12-2010	Jason Phillips and Joshua Zinn	Field delineation groundtruthing features for reconfigured alternative, redesigned transmission line and substation

[15] Through field surveys, topographical and hydrological investigation, and analysis, AECOM determined that the DARSA does not support jurisdictional waters of the United States. A formal verification of the determination of the absence of waters of the United States occurring within the disturbance area is currently being pursued through documentation (final JD) with USACE.

Field delineation within the Proposed Project DARSA during the March 2009 surveys involved two field teams, each with two ecologists. Field delineation within the Proposed Project DARSA during the October 2009 survey involved one ecologist. Field delineation within the Proposed Project DARSA during the November 2009 field surveys involved two ecologists. Field delineation within the Reconfigured Alternative DARSA and transmission line and substation areas during the April 2010 field surveys involved two ecologists. Supplemental field delineations were conducted in response to a field verification meeting with CDFG, CEC, and BLM on November 3, 2009, at the Proposed Project DARSA and a request by CEC to provide analysis for the Reconfigured Alternative design. Teams and individuals recorded the presence (including extents, types, and boundaries) of potential jurisdictional features with two Trimble XH subfoot accuracy Global Positioning System (GPS) handheld units (or one GPS unit per two person team). At the close of each field day, all acquired field data were submitted via the internet to AECOM San Diego's Geographic Information Systems (GIS) specialists for post-field processing using Trimble GPS Analyst (Version 2.1) GIS software. Post-field analysis to code, define, designate, and edit all acquired GPS field data representing jurisdictional waters occurring within the DARSA was conducted in tandem with an AECOM GIS specialist and the ecologists who performed the fieldwork.

Jurisdictional Waters of the United States

Jurisdictional waters of the United States are defined in 33 CFR 328 (Definition of Waters of the United States). The DARSA has the potential for the presence of, at a minimum, two types of federally regulated waters, warranting the following:

1. Formal delineation of waters of the United States in the form of wetlands based on the three-parameter method.[16] The three-parameter method for identifying and delineating wetlands is outlined in and in accordance with Federal guidance and procedure following the *Corps of Engineers Wetlands Delineation Manual* (Manual) (Environmental Laboratory 1987) and the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region* (Version 2.0) (2008 Supplement) (Environmental Laboratory 2008).[17]

2. Formal delineations of other nonwetland waters of the United States to define and identify the jurisdictional lateral extent of nonwetland waters using field indicators of ordinary high water mark (OHWM) as defined by 33 CFR 238.3(e), Federal guidance and procedures

[16] The three-parameter method is the simultaneous presence (co-occurrence) of wetland hydrology, hydric soil, and hydrophytic vegetation.

[17] The Manual and 2008 Supplement are guidance documents for delineating jurisdictional waters in the form of wetlands only.

outlined in *A Field Guide to the Identification of the Ordinary High Water Mark (OHWM) in the Arid West Region of the Western United States: A Delineation Manual* (Lichvar and McColley 2008),[18] *Distribution of Ordinary High Water Mark (OHWM) indicators and their reliability in identifying the limits of "Waters of the United States" in arid southwestern channels* (Lichvar et al. 2006), and other relevant Federal guidance and procedural documents (see below).

This jurisdictional delineation applied two field methodologies in delineating potential jurisdictional waters of the United States as described below. All potential waters of the United States were delineated to their jurisdictional limits as defined by 33 CFR 328.4 (Limits of jurisdiction).

Methodology One: To make a determination that an area is a wetland, the Manual requires that under "normal circumstances"[19] a minimum of one primary wetland indicator be confirmed for each of the three wetland parameters (Environmental Laboratory 1987). Pre-field surveys and a detailed field reconnaissance were conducted to ascertain and confirm "normal circumstances" and the presence or absence of any one of the three wetland parameters occurring within the DARSA (Table 5). Once pre-field surveys and field reconnaissance were completed, it was determined that no hydrophytic vegetation or wetland hydrology occurred within the DARSA. Therefore, it was determined that a formal delineation for wetlands would not be required, as no potential for jurisdictional waters of the United States in the form of wetlands was present within the DARSA. However, the Arid West region is dominated by watersheds with intermittent and ephemeral dry washes, such as the one occurring within the DARSA. Many such aquatic resources, which may or may not constitute nonwetland waters of the United States, lack the three characteristic features of a wetland but still perform wetland functions (Lichvar and Field 2007).[20]

[18] Datasheets from this field delineation manual were used as guidance documents for this delineation and are not included in this JDR.

[19] Pursuant to the Manual and 33 CFR 328.3(b). While "normal circumstances" has not been defined by regulation, the USACE previously provided guidance on this subject in two expired "normal circumstances" Regulatory Guidance Letters (RGLs) (RGLs 82-2 and 86-9).

[20] Based on field reconnaissance. Wetland Determination Data Forms were used as guidance documents for this delineation and are not included in this JDR, as the survey area did not support any one of the three wetland parameters.

Table 5
Survey Results for Potential Jurisdictional Waters of the United States in the Form of Wetlands[a] Occurring within the DARSA

Vegetation Community	Hydrophytic Vegetation	Hydric Soils	Wetland Hydrology	Potential Federal Waters	Potential State Waters	Comments
Desert Dry Wash Woodland	No	Likely occurring (as entisols) only within the established desert washes. The soil polygons and mapping within survey area are unconfirmed by NRCS)	No	No	Yes	Confirm Federal jurisdictional status with JD

[a] As defined by 33 CFR 328.3(b); 40 CFR 230.3(t); the Manual; and the 2008 Supplement.

Methodology Two: OHWM indicators were used to delineate the lateral jurisdictional extent of potential nonwetland waters of the United States. Lateral jurisdictional limits were established for all drainage features/channels occurring within the DARSA in conjunction with field verification for a determination of the OHWM, which provides an acceptable estimate for the lateral jurisdictional limits. The OHWM of the drainage features/channels was identified on the basis of the following:

- Water marks within their respective channel banks established by the fluctuations of water and indicated by physical characteristics such as clear, natural lines impressed on the banks;
- Scour and shelving, local deposition, distinct and indistinct terraces, and changes in the character of soil;
- The presence of developed longitudinal bars within channel margins;
- Type, abundance, and relative age of vegetation and/or destruction of terrestrial vegetation, and the presence and absence of litter and debris within the channels;
- Channel configuration, estimated streamflow behavior, and other subtle geomorphic evidence indicative of regular flow levels;
- Consideration of precipitation patterns and lack of consistent flow;
- Geomorphic OHWM indicators (e.g., surface relief, cobblebars, benches, crested ripples, particle size distribution, mudcracks, gravel sheets, desert pavement, and dunes); and
- Pattern and location of relictual channels and discontinuous drainage features.

The criteria for frequency and duration of the OHWM have not been defined under the CWA or under any guidance from USACE for field delineators; therefore, identifiable field indicators and characteristics of OHWM, best professional judgment, interpretation of 33 CFR 328.3(e), and appropriate regulatory guidance letters (RGLs) were applied to determine the potential jurisdictional extent of OHWM within the DARSA. Arid West channels have recently been described as "ordinary" when they typically correspond to a 5- to 8-year event and typically have an active floodplain with sparse vegetation cover, shifts in soil texture, and occasional alignment with distinctive bed and bank features (Lichvar and Field 2007). However, modeling has shown that slightly larger events (5- to 10-year recurrence) may be necessary to engage the active floodplain in arid systems (Lichvar et al. 2006).

OHWM and the limits of jurisdiction are discussed in the preamble to the USACE November 13, 1986, Final Rule, Regulatory Programs of the Corps of Engineers, Federal Register Volume 51, No. 219, page 41217, which discusses the proper interpretation of 33 CFR Part 328.4 (c)(1) as follows:

> Section 328.4: *Limits of Jurisdiction.* Section 328.4 (c)(1) defines the lateral limit of jurisdiction in nontidal waters as the OHWM provided the jurisdiction is not extended by the presence of wetlands. Therefore, it should be concluded that in the absence of wetlands the upstream limit of Corps jurisdiction also stops when the OHWM is no longer perceptible.

In addition, RGL 88-06, issued June 27, 1988, discussed the OHWM as follows:

> OHWM: The OHWM is the physical evidence (shelving, debris lines, etc.) established by normal fluctuations of water level. For rivers and streams, the OHWM is meant to mark the within-channel high flows, not the average annual flood elevation that generally extends beyond the channel.[21]

RGL 05-05, issued December 7, 2005, discusses the field practice and practicability of identifying, determining, and applying the OHWM for nontidal waters under Section 404 of the CWA (and under Sections 9 and 10 of the Rivers and Harbors Act of 1899), and states the following:

[21] Following RGL 05-06 (Expired RGLs). Unless superseded by specific provisions of subsequently issued regulations or RGLs, the guidance provided in RGLs generally remains valid after the expiration date as discussed in the Federal Register notice on RGLs of March 22, 1999, FR Vol. 64, No. 54, page 13783.

> Where the physical characteristics are inconclusive, misleading, unreliable, or otherwise not evident, districts may determine OHWM by using other appropriate means that consider the characteristics of the surrounding areas, provided those other means are reliable.[22] Such other reliable methods that may be indicative of the OHWM include, but are not limited to, lake and stream gage data, elevation data, spillway height, flood predictions, historic records of water flow, and statistical evidence.

Many stream channels in arid regions are dry for much of the year and, at times, may lack hydrology indicators entirely or exhibit relic OHWM features from exceptional hydrological events. RGL 05-05 further states the following:

> When making OHWM determinations, districts should be careful to look at characteristics associated with ordinary high water events, which occur on a regular or frequent basis. Evidence resulting from extraordinary events, including major flooding and storm surges, is not indicative of OHWM. For instance, a litter or wrack line resulting from a 200-year flood event would in most cases not be considered evidence of an OHWM.

Jurisdictional Determination for Waters of the United States

Determining whether the delineated waters within the DARSA are in fact jurisdictional waters of the United States and under the regulatory authority of USACE (including the final acreages and types of jurisdictional waters of the United States) is primarily based on the following:[23]

a. The May 30, 2007, USACE *Jurisdictional Determination Form Instructional Guidebook* (USACE/USEPA 2007) and the Approved JD Form.

b. The June 5, 2007, USACE/USEPA Memorandum Re: Jurisdiction Following The U.S. Supreme Court Decision In *Rapanos v. United States* on the interpretation of the *Rapanos* Supreme Court case for making a JD for waters of the United States

[22] In some cases, the physical characteristics may be misleading and would not be reliable for determining the OHWM. For example, water levels or flows may be manipulated by human intervention for power generation or water supply. For such cases, districts should consider using other appropriate means to determine the OHWM (RGL 05-05).

[23] This delineation followed these procedural guidance documents to ascertain the jurisdictional status of all delineated waters occurring within the disturbance area.

(including wetlands) (USEPA/USACE).[24, 25] This memorandum provides guidance to USEPA and USACE on implementing the *Rapanos* Supreme Court decision.

c. The June 5, 2007, USEPA/USACE Memorandum for the Field: Coordination on JDs under CWA in light of *SWANCC* [26] and *Rapanos* Supreme Court decisions.[27] This memorandum outlined procedures that replace the coordination procedures contained in the January 2003 USEPA/USACE guidance implementing the *SWANCC* decision (but leaves the remainder of that guidance unaffected) and articulates new coordination procedures for JDs affected by *Rapanos* (USEPA/USACE).[28]

d. The January 28, 2008, Coordination Memorandum. This memorandum outlined the process for coordinating JDs with USEPA and USACE.

e. The June 26, 2008, USACE RGL 08-02. This RGL explains the differences between Approved JDs and Preliminary JDs, and provides guidance on when an Approved JD is required and when a landowner, permit applicant, or other "affected party" can decline to request and obtain an Approved JD and elect to use a Preliminary JD instead.[29]

f. The December 2, 2008, USACE Guidance Memorandum Clean Water Act Jurisdiction Following the U.S. Supreme Court's Decision In *Rapanos v. United States* & *Carabell v. United States*. This guidance incorporates revisions to the USEPA/USACE Memorandum originally issued on June 6, 2007, after careful consideration of public comments received and based on the agencies' experience in implementing the *Rapanos* decision.

g. The December 2, 2008, USACE Response To Comments "Clean Water Act Jurisdiction Following The Supreme Court's Decision In *Rapanos v. United States & Carabell v. United States Guidance*" Issued June 5, 2007.

h. The December 2, 2008, USACE Questions and Answers Regarding the Revised *Rapanos & Carabell* Guidance.

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24 "Clean Water Act Jurisdiction Following the U.S. Supreme Court's Decision in *Rapanos v. United States & Carabell v. United States*" (June 5, 2007).

25 126 S. Ct 2208 (2006). This case was consolidated with *Carabell v. United States*.

26 *Solid Waste Agency of Northern Cook County [SWANCC] v. United States Army Corps of Engineers* (531 U.S. 159, 121 S Ct 675 [2001]).

27 "Memorandum for Director of Civil Works and USEPA Regional Administrators" (June 5, 2007).

28 "Clean Water Act Jurisdiction Following the U.S. Supreme Court's Decision in *Rapanos v. United States & Carabell v. United States*" (June 5, 2007).

29 RGL 08-02 outlines that Preliminary JDs cannot be appealed.

For this JDR, the formal procedure for a JD requires the submittal of an Approved JD Form (Attachment 2) to USACE (Los Angeles District, South Coast Branch) following Federal guidance, as applicable. Based on the results of the delineation and Federal guidance outlined above, this JDR was prepared to provide support to USACE in making a formal determination of all waters delineated within the DARSA, including those features that are determined to be isolated waters and thus not regulated by USACE for the following reasons:

1. All ephemeral washes delineated within the disturbance area abate into the landscape and become a discontinuous ephemeral wash.
2. No ephemeral wash delineated within the disturbance area is directly connected with the McCoy Wash, which is itself a large ephemeral wash that presents an indirect hydrological connection with the Colorado River.
3. The lack of hydrological connectivity of the ephemeral washes into storm drains, culverts, or ditches (no storm drains are present within the disturbance area).
4. The lack of hydrological connectivity (presenting a significant nexus [SNX] to any traditional navigable waterbody [TNW]) for washes occurring within the disturbance area.
5. The evaluation of the ephemeral washes not presenting an SNX to a TNW include the volume, duration, and frequency of the flow of water to a TNW (the Salton Sea, 60 miles southwest and the Colorado River, 15 miles east of the disturbance area).
6. Examination of the flow characteristics and functions of ephemeral washes (which do not support adjacent wetlands) has been determined not to present a significant effect on the chemical, physical, and biological integrity of downstream TNWs.
7. Lack of an ecological connection to TNWs. The ephemeral washes present a low to no potential or capacity to transfer nutrients and organic carbon (vital to support downstream foodwebs [e.g., macroinvertebrates] present in headwater streams or to convert carbon in leaf litter making it available to species downstream), nor present habitat services such as providing spawning areas for recreationally or commercially important species in downstream waters.

Jurisdictional Waters of the State

Under Section 1600 *et seq*. of the CFGC, the CDFG regulates activities that would alter the flow, bed, channel, or bank of streams and lakes. The limits of CDFG jurisdiction are defined in CFGC

Section 1600 *et seq*. as the "bed, channel or bank of any river, stream or lake designated by the department in which there is at any time an existing fish or wildlife resource or from which these resources derive benefit."[30] However, in practice, CDFG usually extends its jurisdictional limit and assertion to the top of a bank of a stream, the bank of a lake, or outer edge of the riparian vegetation, whichever is wider.

Under Section 13000 *et seq*. of the CWC, the RWQCB is authorized to regulate activity that would result in discharges of waste and fill material to waters of the state. In practice, RWQCB usually extends its jurisdictional limit to waters of the states (as defined by CWC Section 13050[e]) which support or present beneficial uses, once beneficial uses are designated within a regional Basin Plan.[31]

Boundaries for xeric riparian waters of the State were determined (and recorded) by the presence of shelving and/or scour resulting in an established bank, bed, and channel of an ephemeral wash feature and its associated riparian areas (where applicable). In specific areas within the ephemeral wash channels, where evidence of shelving or scour was absent, subsurface investigations were undertaken to identify established channel banks. Although some portions of the ephemeral washes present shelving with smooth-toe transitions, these features are composed of friable sand and are evidence of recent sand deposition (likely from wind erosion and aeolian saltation) covering the bank features. Swale features did not meet the definition of established bed and bank or as a stream feature as defined in the CFGC Section 1600 *et seq*. and Title 14 CCR 1.72 and are therefore not considered as jurisdictional waters of the state in this JDR.

For wetlands and other aquatic habitats occurring in California, CDFG relies on USFWS wetland definition and classification system, which is based on *Classification of Wetland and Deepwater Habitats of the United States* (Cowardin et al. 1979). Therefore, jurisdictional wetland delineations within the DARSA area have been conducted based on the one-parameter[32] method outlined in CDFG/USFWS guidance documents and classification manual(s) to define presence

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30 The California Code of Regulations (Title 14 CCR 1.72) defines a stream as: "…a body of water that flows at least periodically or intermittently through a bed or channel having banks and supports fish or other aquatic life. This includes watercourses having a surface or subsurface flow that supports or has supported riparian vegetation."

31 ' Beneficial Uses' are dependent on and occur only when sufficient flow exists. Vegetated swale features do not support adequate surface flow or groundwater recharge potential and thus, are not designated as an aquatic feature in the Colorado River Basin Plan (Chapter 2-Beneficial Uses and Table 2-2: Beneficial Uses of Surface Waters in the East Colorado River Basin) (RWQCB 1994).

32 For Federal jurisdictional waters, a determination for the presence of wetland is based on the presence of three parameters occurring simultaneously at the area of investigation and study. These three wetland parameters are 1) hydrophytic vegetation, 2) hydric soils, and 3) wetland hydrology. For State-defined wetlands, only one of these three wetland criteria is required to be present for the State to consider an aquatic feature a wetland.

and State jurisdictional extent. The Cowardin method requires diligence to avoid false positive conclusions (e.g., concluding that an area with no transitional relation to the aquatic system is a wetland based on presence of vegetation equally likely to be found in wetland or nonwetland circumstances).[33]

Based on the CFGC Section 1600 *et seq*. definition, CDFG regulatory practice, and corresponding field guidance, specific to the DARSA, provided on site by CDFG and CEC on November 3, 2009 (AECOM 2009a), field diagnostic features were used to determine and delineate the presence of two types of jurisdictional waters of the State, which collectively and individually represent the jurisdictional extent, occurring within the DARSA:

1. Desert Dry Wash Woodland, and
2. Unvegetated Ephemeral Dry Wash,

<u>Desert Dry Wash Woodland</u>

The jurisdictional limits of desert dry wash woodland were considered, recorded, and mapped for areas within all washes and wash features where the association of wash-dependent vegetation *was* present and/or where Sonoran creosote bush scrub (Holland Code 33100) was not established at more than 5 percent absolute cover. The jurisdictional linear and lateral extent of desert dry wash woodland occurring within the disturbance area is collectively composed of three xeric riparian features:

i. wash-dependent vegetation,
ii. vegetated ephemeral dry wash, and
iii. riparian interfluves.

Wash-Dependent Vegetation

Wash-dependent vegetation was considered, recorded, and mapped for ephemeral washes and desert dry wash woodland occurring within the DARSA. Subsampling of wash-dependent vegetation occurred for 19 selected portions (reaches) of the (relatively) major washes occurring within the western, central, and southern portions of the DARSA (Table 6) (Figure 11). The MMU used for the wash-dependent vegetation subsampling was 0.01 acre. The wash-dependent vegetation occurring within desert dry wash woodland is composed of nine plant species:

[33] Although aquatic features can be delineated and defined as wetlands under the Cowardin Classification System, they are not necessarily *jurisdictional* waters of the United States or State.

a. catclaw (*Acacia greggii*),
b. desert starvine (*Brandegea bigelovii*),
c. desert lavender (*Hyptis emoryi*),
d. ironwood (*Olneya tesota*),
e. blue palo verde (*Parkinsonia florida*),
f. big galleta grass (*Pleuraphis rigida*),
g. smoke tree (*Psorothamnus spinosus*),
h. honey mesquite (*Prosopis glandulosa*), and
i. spiny senna (*Senna armata*).

Table 6
Primary Ephemeral Wash-Dependent Vegetation Cover Subsampling[a]

Subsampling Area	Vegetated[b] Ephemeral Dry Wash (DDWW)	Sampled[b] Wash-Dependent Vegetation (DDWW)	Riparian[b] Interfluve (DDWW)	Total[b] Subsample Area (ωi)	% Cover Wash-Dependent Vegetation (χi)	(ωi*χi)
1	1.22	0.02		1.24	1.61	0.02
2	0.5	0.13		0.63	20.63	0.13
3	1.52	0.33		1.86	17.74	0.33
4	0.1	0.14		0.24	58.33	0.14
5	2.1	0.46		2.56	17.97	0.46
6	2.13	0.23		2.39	9.62	0.23
7	0.83	0.38	0.01	1.22	31.15	0.38
8	0.83	0.35		1.18	29.66	0.35
9	3.85	1.32		5.17	25.53	1.32
10	2.68	1.09	2.36	6.15	17.72	1.09
11	0.18	0.13		0.31	41.94	0.13
12	0.21	0.18		0.39	46.15	0.18
13	0.57	0.29		0.86	33.72	0.29
14	4.92	1.85	8.03	14.8	12.50	1.85
15	0.55	0.07		0.62	11.29	0.07
16	0.59	0.19		0.78	24.36	0.19
17		0.31		0.31	100.00	0.31
18	0.96	0.26		1.26	20.63	0.26
19	0.71	0.22		0.99	22.22	0.22
*SUM(ωi*χi)*						*7.95*
SUM ωi						*42.96*
Weighted Mean SUM (ωi*χi)/SUM ωi						**0.19**

[a] A weighted arithmetic mean was calculated where the estimate of absolute cover (χ) equals the sum of each sample of absolute cover (χi) multiplied by the area of each sample, or the weight (ωi), divided by the sum of all weights. The formula used was: $\chi = \sum\omega i(\chi i)/\sum\omega i$ OR $X = \omega 1(\chi 1) + \omega 2(\chi 2) + \omega 3(\chi 3)\ldots / \omega 1 + \omega 2 + \omega 3\ldots$
[b] In acres.

Using GPS handheld units, field data points were taken for all nine wash-dependent plant species occurring within the 19 designated subsampling areas of the desert dry wash woodland occurring within the DARSA (Figure 11). Canopy diameters (individuals and mixed/monotypic stands) were recorded for absolute cover. For the three subsample areas within the major wash, a weighted arithmetic mean of percent cover for wash-dependent vegetation was calculated by dividing the total acres of the subsample area by the acres of mapped wash-dependent vegetation. An overall mean of the three subsample areas was then calculated. This percent cover was extrapolated to estimate total cover of wash-dependent vegetation occurring within desert dry wash woodland of the major wash. For the smaller washes located in the west and northwest portions of the disturbance area, all wash-dependent vegetation was mapped discretely to determine absolute cover of desert dry wash woodland occurring in these features.

Vegetated Ephemeral Dry Wash

Vegetated ephemeral dry washes are desert washes that present an established bed, bank, and channel that support wash-dependent vegetation (see methodology for delineating unvegetated ephemeral dry wash, below).

Riparian Interfluves

Riparian interfluves are islands or terraces populated by wash-dependent vegetation or an intermix of wash-dependent vegetation and Sonoran creosote bush scrub that are encompassed by vegetated and/or unvegetated ephemeral dry wash (see below) and desert dry wash woodland (the xeric riparian extent). Riparian interfluves are considered a jurisdictional water (as a component of desert dry wash woodland).

Unvegetated Ephemeral Dry Wash

Unvegetated ephemeral dry washes make up the other component of jurisdictional waters in the form of ephemeral stream features occurring within the DARSA. They are defined by shelving and/or scour resulting in an established bed, bank, and channel. In areas where evidence of distinct shelving and/or scour were absent, but some indication of past surface waterflow could be observed, it was ascertained that these features were either swales that support low-volume and low-duration surface flow and/or were low-lying undefined relatively linear features in the landscape that are unvegetated or primarily populated exclusively by Sonoran creosote bush scrub, or eroded relictual washes that support sheetflow during rain events. Unvegetated ephemeral dry wash primarily does not support wash-dependent vegetation. There are sporadic occurrences of individual trees; however, based on the minimum mapping unit of 0.01 acre, these areas are unvegetated.

Jurisdictional lateral extents of the washes were determined by the farthest extents of the respective established channel bed and banks (including shelving and scouring) of each subchannel. The delineation of unvegetated ephemeral washes collectively includes all respective subchannels of each larger wash into linear ephemeral wash features for jurisdictional waters (see below). Jurisdictional linear extents of the washes were determined by the farthest extents of the established channel bed and banks (including shelving and scouring). When the established channel bed and banks began to transition into less distinct features, such as features that only support sheet flow, and/or features that began to blend into the landscape and/or reflect the features of a swale or relictual channel, the jurisdictional linear extent(s) of the feature(s) was determined to have ceased.

All washes occurring within the disturbance area are generally linear. However, the washes are collectively made up of multiple subchannels of varying sizes, which exhibit sinuosity and interface, resulting in anastomosed morphology. By virtue of the anastomosed morphology occurring within the washes, there are interfluves that have been formed by these multiple subchannels. Within the unvegetated ephemeral dry wash, there are interfluves of Sonoran creosote bush scrub habitat between the channels of the dry washes. These interfluves are upland features, encompassed by unvegetated ephemeral dry wash, and are not considered jurisdictional. Channels appear to remain visible on a recent aerial map of the disturbance area (USDA NAIP 2005) beyond what was delineated. However, these areas were ground-truthed during spring 2009 to confirm that all evidence of bed, banks, scour, and shelving have abated and/or the vegetation associated with swales is Sonoran creosote bush scrub.

Non-Jurisdictional Features

Vegetated Swales Supporting the Creosote Bush - Big Galleta Grass Association

The multiple large and small vegetated swale features on site are populated by the Creosote Bush - Big Galleta Grass Association (and to a much lesser extent desert lavender and desert star vine). Creosote Bush – Big Galleta Grass Association is considered as a special community type over which CDFG is asserting jurisdiction (AECOM 2009b). However, these swale features do not meet the definition of jurisdictional waters, outlined above, and regulated by the CDFG. The vegetated swales occurring within the DARSA range from small individual features approximately 10-feet in width to large collective swale networks up to approximately 800 feet wide[34] and collectively comprise a bajada-type topography within the survey area.

[34] The swale networks encompass large upland interfluve areas.

Lateral extents of the vegetated swales were mapped in the field by determining the farthest extents of the topographically related swale features (e.g., linear depressions supporting subtle surface flow indicators) that encompassed wash-dependent vegetation and/or discontinuous, undeveloped and underdeveloped linear depressional features. The linear and lateral extent of the special community type continued until the swale features abated completely into the landscape and were imperceptible to the surrounding upland and/or where big galleta grass ceased to exist as grouped individuals. There is no definition of population densities in guidance documents (e.g., Sawyer and Keeler-Wolf [1995] and CDFG [2003] and CDFG [2007]) to determine the threshold of when the Creosote Bush - Big Galleta Grass Association occurs and/or ceases. Therefore, the special community type, as determined by the presence of big galleta grass stopped when individuals were 50 or more feet apart from one another. At this threshold of vegetation association density, the big galleta grass would commonly cease to exist within the swale feature and concomitantly, at this point, the physical swale(s) would become either exclusively populated by creosote or abate into the landscape, and the special community type would therefore end.

The vegetated swales in the DARSA occur on gentle to nearly flat slopes and typically are populated by creosote, big galleta grass, or other low-lying upland vegetation. The swales are generally poorly defined washes characterized by low volume, infrequent or short -duration flow and are usually shallow topographical features in the landscape that may convey water across upland areas during and following uncommon storm events. Swales are generally not considered jurisdictional waters of the United States because they lack an identifiable OHWM, are not tributaries themselves, or they do not have a significant nexus to traditionally navigable waterways (TNWs [e.g., the Pacific Ocean]).[35] The vegetated swales within the DARSA appear to convey surface or subsurface water from a roughly northwest-to-southeast direction across the site. It is unlikely that these swales convey runoff every year, but there is evidence, through subtle and poorly defined hydrological indicators, that they move surface water across the landscape if there is a large enough storm event. However, the swales abate into the landscape prior to reaching and connecting into a more prominent watercourse (e.g., the McCoy Wash). Although CDFG considers the swale network as ecologically relational to the larger washes within the survey area and thus jurisdictional waters of the state the CDFG does not consider them a significant aquatic feature which would require mitigation, if impacted (AECOM 2009b). For this JDR, the vegetated swales do not meet the definition for waters of the state as discussed and defined above and are therefore not considered as jurisdictional waters of the state as

[35] Even when not considered a jurisdictional water of the United States or State, swales may still contribute to a surface hydrologic connection between an uplands and aquatic features. However, such hydrological connections are dependent of large, uncommon storm events.

regulated by the CDFG in this JDR. However, the vegetated swales do support a special community type (e.g., Creosote Bush-Big Galleta Grass).

VI. RESULTS

A. Jurisdictional Waters of the United States

The DARSA does not support or contain jurisdictional waters of the United States (see above). Jurisdictional waters of the United States delineated within the Proposed Project DARSA are listed in Table 7.

B. Jurisdictional Waters of the State

All desert dry wash woodland and unvegetated ephemeral desert dry washes occurring within the DARSA were delineated as waters of the State. Jurisdictional waters were mapped on a current aerial photograph at a scale of 1 inch = 5000 feet.

Delineated jurisdictional waters of the State for the Proposed Project DARSA are displayed in Figure 12 and listed in Table 7 and summarized in Table 8. Components of jurisdictional waters occurring within the Proposed Project DARSA are provided in Table 9.

Delineated jurisdictional waters of the State for the Reconfigured Alternative DARSA are displayed in Figure 13 and listed in Table 10 and summarized in Table 11. Components of jurisdictional waters occurring within the Reconfigured Alternative DARSA are provided in Table 12.

An enlarged map at a scale of 1 inch = 1250 feet displaying all delineated waters occurring within the DARSA is also provided (Figure 14). Photo locations occurring within the DARSA are included in Figure 15a. Survey area photos are included in Figures 15b through 15n. Waters of the State were delineated within the Project Disturbance Area and adjacent upstream and downstream waters. While it is typical for many projects to delineate only to the limits of disturbance, additional offsite waters are hydrologically connected to the Project Disturbance Area and have been delineated to identify offsite washes that may be indirectly impacted by the proposed Project and Reconfigured Alternative.[36]

[36] Most likely, upstream washes would not be impacted. Downstream waters containing wash-dependent vegetation would likely be indirectly impacted by the rerouting of the onsite washes; the Revised Supplemental Biological Survey Report (AECOM 20010) will evaluate these impacts.

Table 7
Potential Jurisdictional Waters of the United States and State Occurring within the Proposed Project DARSA [a]

Type of Jurisdictional Waters	Type of Habitat (Holland 1986)	Type of Habitat (Cowardin et al. 1979)	Area of Aquatic Resource (ac)[b]			
			Inside Proposed Project DARSA	Directly Outside Proposed Project DARSA		Total Survey Area
				Hydrologically Connected Upstream	Hydrologically Connected Downstream[c]	
Jurisdictional Waters of the United States						
None	N/A	N/A	0.0	0.0	0.0	0.0
		Total USACE Waters =	*0.0*	*0.0*	*0.0*	*0.0*
Subtotal Jurisdictional Waters of the United States			***0.0***	***0.0***	***0.0***	***0.0***
Jurisdictional Waters of the State						
Xeric Riparian Extent	Desert Dry Wash Woodland (Holland Code 62200)	Palustrine; Forested, Broad-Leaved, Evergreen, Intermittently Flooded/ Temporary, Well Drained/Fresh, Alkaline	197.04	7.22	137.49	341.76
Ephemeral Channel	Nonvegetated Channel (Holland Code 64200)	Riverine; Unconsolidated Bottom, Sand, Intermittently Flooded, Temporary, Well Drained/ Fresh, Alkaline	8.56	0.23	0.33	9.12
		Total CDFG Waters =	205.60	7.45	137.82	350.88
Subtotal Jurisdictional Waters of the State			*205.60*	*7.45*	*137.82*	*350.88*
Grand Total Jurisdictional Waters			**205.60**	**7.45**	**137.82**	**350.88**

[a] Based on the total area of jurisdictional waters delineated within the Proposed Project DARSA. Final acreages of jurisdictional waters of the United States will be based on the JD process undertaken by the USACE/USEPA to confirm the findings of this JDR (see above). The total area of federally regulated waters may change after the formal JD process. Swales are generally not considered jurisdictional waters of the United States because they lack an identifiable OHWM, are not tributaries themselves, or they do not have a significant nexus to traditionally navigable waterways (TNWs [e.g., the Pacific Ocean]) (see above). Even when not considered a jurisdictional water of the United States or State, swales may still contribute to a surface hydrologic connection between an uplands and aquatic features. However, such hydrological connections are dependent of large, uncommon storm events. The 410.81 acres of vegetated swales containing creosote bush – big galleta grass association are considered a special community type by the CDFG and are not considered as jurisdictional waters of the state as defined by Title 14 CCR 1.72 and CFGC Section 1600 *et seq.* and as regulated by the CDFG in this JDR.

[b] Acreage of all jurisdictional waters was determined by using the GIS program ArcGIS. All acreages are rounded to the nearest hundredth after summation.

[c] Several areas outside the Proposed Project DARSA were delineated to facilitate impacts analysis as requested by CDFG.

Table 8
Summary of Potential Jurisdictional Waters of the State Occurring within the Proposed Project DARSA[a]

Form of Jurisdictional Waters of the State	Regulatory Authority	Type of Habitat	Acres within the Survey Area			
			Inside Proposed Project DARSA	Directly Outside Proposed Project DARSA		Total Survey Area
				Hydrologically Connected Upstream	Hydrologically Connected Downstream[b]	
Xeric Riparian Extent	CDFG, RWQCB	Dry Desert Wash Woodland	197.04	7.22	137.49	341.76
Unvegetated Washes	CDFG, RWQCB	Ephemeral Drainage Features	8.56	0.23	0.33	9.12
Total			**205.60**	**7.45**	**137.82**	**350.88**

[a] Acreage of all jurisdictional waters was determined by utilizing the GIS program ArcGIS. All acreages are rounded to the nearest hundredth. The 410.81 acres of vegetated swales containing creosote bush - big galleta grass association are considered a special community type by the CDFG and are not considered as jurisdictional waters of the state as defined by Title 14 CCR 1.72 and CFGC Section 1600 *et seq.* and as regulated by the CDFG in this JDR.

[b] Several areas outside the disturbance area were delineated to facilitate impacts analysis**.** Specifically, downstream waters beyond the disturbance area may potentially be indirectly impacted by the rerouting of desert washes within the disturbance area.

Table 9
Components of Jurisdictional Waters of the State Occurring within the Proposed Project DARSA[a]

Type of Jurisdictional Waters	Acres
Unvegetated Ephemeral Dry Wash	9.12
Desert Dry Wash Woodland[b]	341.76
Wash-Dependent Vegetation	*64.93*
Riparian Interfluve	*21.14*
Vegetated Ephemeral Dry Wash	*255.69*
Total	**350.88**

[a] Acreage of all components of jurisdictional waters occurring within the Proposed Project DARSA was determined by utilizing the GIS program ArcGIS. All acreages are rounded to the nearest hundreth.

[b] Acreage for subsampled wash-dependent vegetation occurring within the DARSA was extrapolated based on weighted mean cover obtained through subsampling of 341.76 acres of desert dry wash woodland occurring within the Proposed Project DARSA and multiplying this figure by the 19 percent weighted average of wash-dependent vegetation which resulted in 64.93 acres of wash-dependent vegetation occurring within the Proposed Project DARSA (Table 9). The portion of wash-dependent vegetation that was mapped as riparian interfluves or vegetated ephemeral dry wash in the field was deleted from the acreages for riparian interfluves and vegetated ephemeral dry wash to accurately reflect the acreage of the components of desert dry wash woodland. Of the 64.93 acres of wash-dependent vegetation, approximately 8.28 acres was physically mapped as a part of field subsampling (refer to Table 6, above), 4.33 acres of extrapolated area was subtracted from riparian interfluves, and the remaining 52.32 acres of extrapolated area was subtracted from vegetated ephemeral dry wash (an expanded methodology is located in Attachment 3).

Table 10
Potential Jurisdictional Waters of the United States and State Occurring within the Reconfigured Alternative DARSA[a]

Type of Jurisdictional Waters	Type of Habitat (Holland 1986)	Type of Habitat (Cowardin et al. 1979)	Area of Aquatic Resource (ac)[b]			
			Inside Reconfigured Alternative DARSA	Directly Outside Reconfigured Alternative DARSA		Total Survey Area
				Hydrologically Connected Upstream	Hydrologically Connected Downstream[c]	
Jurisdictional Waters of the United States						
None	N/A	N/A	0.0	0.0	0.0	0.0
		Total USACE Waters =	*0.0*	*0.0*	*0.0*	*0.0*
Subtotal Jurisdictional Waters of the United States			***0.0***	***0.0***	***0.0***	***0.0***
Jurisdictional Waters of the State						
Xeric Riparian Extent	Desert Dry Wash Woodland (Holland Code 62200)	Palustrine; Forested, Broad-Leaved, Evergreen, Intermittently Flooded/ Temporary, Well Drained/Fresh, Alkaline	171.32	7.44	71.15	249.90
Ephemeral Channel	Nonvegetated Channel (Holland Code 64200)	Riverine; Unconsolidated Bottom, Sand, Intermittently Flooded, Temporary, Well Drained/ Fresh, Alkaline	4.96	1.28	0.59	6.83
		Total CDFG Waters =	*176.28*	*8.72*	*71.74*	*256.73*
Subtotal Jurisdictional Waters of the State			***176.28***	***8.72***	***71.74***	***256.73***
Grand Total Jurisdictional Waters			**176.28**	**8.72**	**71.74**	**256.73**

[a] Based on the total area of jurisdictional waters delineated within the Proposed Project DARSA. Final acreages of jurisdictional waters of the United States will be based on the JD process undertaken by the USACE/USEPA to confirm the findings of this JDR (see above). The total area of federally regulated waters may change after the formal JD process. Swales are generally not considered jurisdictional waters of the United States because they lack an identifiable OHWM, are not tributaries themselves, or they do not have a significant nexus to traditionally navigable waterways (TNWs [e.g., the Pacific Ocean]) (see above). Even when not considered a jurisdictional water of the United States or State, swales may still contribute to a surface hydrologic connection between an uplands and aquatic features. However, such hydrological connections are dependent of large, uncommon storm events. The 283.31 acres of vegetated swales containing creosote bush – big galleta grass association are considered a special community type by the CDFG and are not considered as jurisdictional waters of the state as defined by Title 14 CCR 1.72 and CFGC Section 1600 *et seq.* and as regulated by the CDFG in this JDR.

[b] Acreage of all jurisdictional waters was determined by using the GIS program ArcGIS. All acreages are rounded to the nearest hundredth after summation.

[c] Several areas outside the Reconfigured Alternative DARSA were delineated to facilitate impacts analysis as requested by CDFG.

Table 11
Summary of Potential Jurisdictional Waters of the State Occurring within the Reconfigured Alternative DARSA[a]

Form of Jurisdictional Waters of the State	Regulatory Authority	Type of Habitat	Acres within the Survey Area			
			Inside Reconfigured Alternative DARSA	Directly Outside Reconfigured Alternative DARSA		Total Survey Area
				Hydrologically Connected Upstream	Hydrologically Connected Downstream[b]	
Xeric Riparian Extent	CDFG, RWQCB	Dry Desert Wash Woodland	171.32	7.44	71.15	249.90
Unvegetated Washes	CDFG, RWQCB	Ephemeral Drainage Features	4.96	1.28	0.59	6.83
Total			**176.28**	**8.72**	**71.74**	**256.73**

[a] Acreage of all jurisdictional waters was determined by utilizing the GIS program ArcGIS. All acreages are rounded to the nearest hundredth. The 283.31 acres of vegetated swales containing creosote bush – big galleta grass association are considered a special community type by the CDFG and are not considered as jurisdictional waters of the state as defined by Title 14 CCR 1.72 and CFGC Section 1600 *et seq.* and as regulated by the CDFG in this JDR.

[b] Several areas outside the disturbance area were delineated to facilitate impacts analysis**.** Specifically, downstream waters beyond the disturbance area may potentially be indirectly impacted by the rerouting of desert washes within the disturbance area.

Table 12
Components of Jurisdictional Waters of the State Occurring within the Reconfigured Alternative DARSA[a]

Type of Jurisdictional Waters	Acres
Unvegetated Ephemeral Dry Wash	6.83
Desert Dry Wash Woodland[b]	249.90
Wash-Dependent Vegetation	*47.48*
Riparian Interfluve	*11.25*
Vegetated Ephemeral Dry Wash	*191.17*
Total	**256.73**

[a] Acreage of all components of jurisdictional waters occurring within the Reconfigured Alternative Disturbance Area was determined by utilizing the GIS program ArcGIS. All acreages are rounded to the nearest tenth.

[b] Acreage for subsampled wash-dependent vegetation occurring within the DARSA was extrapolated based on weighted mean cover obtained through subsampling of 249.90 acres of desert dry wash woodland occurring within the Reconfigured Alternative DARSA and multiplying this figure by the 19 percent weighted average of wash-dependent vegetation which resulted in 47.48 acres of wash-dependent vegetation occurring within Reconfigured Alternative DARSA (Table 12). The portion of wash-dependent vegetation that was mapped as riparian interfluves or vegetated ephemeral dry wash in the field was deleted from the acreages for riparian interfluves and vegetated ephemeral dry wash to accurately reflect the acreage of the components of desert dry wash woodland. Of the 47.48 acres of wash-dependent vegetation, approximately 1.29 acres was physically mapped as a part of field subsampling (refer to Table 6, above), 2.56 acres of extrapolated area was subtracted from riparian interfluves, and the remaining 43.63 acres of extrapolated area was subtracted from vegetated ephemeral dry wash (an expanded methodology is located in Attachment 3).

There are multiple ephemeral washes occurring within the DARSA. These ephemeral washes are primarily located within the western, central, and southern portions of the disturbance area. Virtually all the ephemeral washes occurring within the DARSA exhibit a northwest-to-southeast flow orientation, with the largest ephemeral wash extending up to approximately 15,000 feet.

All desert aquatic features occurring within the DARSA eventually abate (terminate) into the desert landscape within the desert prior to hydrologically connecting to the McCoy Wash. The more developed ephemeral washes support extensive and developed desert dry wash woodland within the western, central, and southern portions of the DARSA. Unvegetated ephemeral desert dry wash, which is primarily devoid of wash-dependent plant species due to less availability of surface and subsurface hydrology, primarily occurs within the east and southeast portions of the disturbance area.

The total area of all waters of the State delineated within the Proposed Project DARSA is approximately 350.88 acres. Of these 350.88 acres of jurisdictional waters, 341.76 acres are composed of desert dry wash woodland and 9.12 acres are composed of unvegetated ephemeral dry wash (Table 7). A summary of jurisdictional waters of the State delineated within the Proposed Project DARSA is provided in Table 8. Based upon wash-dependent vegetation subsampling in the DARSA, components of jurisdictional waters of the state occurring within the Proposed Project DARSA are provided in Table 9.

Of the 350.88 acres of jurisdictional waters of the State delineated within the Proposed Project DARSA, 341.76 acres are composed of desert dry wash woodland and 9.12 acres are composed of unvegetated ephemeral dry wash. Based on wash-dependent vegetation subsampling in the DARSA (19 percent absolute cover), the 341.76 acres of desert dry wash woodland occurring within the Proposed Project DARSA is composed of 64.93 acres of wash-dependent vegetation (Attachment 3). The 64.93 acres absolute cover of wash-dependent vegetation is a separate component of the desert dry wash woodland, which is distributed throughout the 255.69 acres of vegetated ephemeral dry wash and 21.14 acres of riparian interfluves occurring within the disturbance area (Table 9).

The total area of all waters of the State delineated within the Reconfigured Alternative DARSA is approximately 256.73 acres. Of these 256.73 acres of jurisdictional waters, 249.90 acres are composed of desert dry wash woodland and 6.83 acres are composed of unvegetated ephemeral dry wash (Table 10). A summary of jurisdictional waters of the State delineated within the Reconfigured Alternative DARSA is provided in Table 11. Based upon wash-dependent

vegetation subsampling in the DARSA, components of jurisdictional waters of the state occurring within the Reconfigured Alternative DARSA are provided in Table 12.

Of the 256.73 acres of jurisdictional waters of the State delineated within the Reconfigured Alternative DARSA, 249.90 acres are composed of desert dry wash woodland and 6.83 acres are composed of unvegetated ephemeral dry wash. Based on wash-dependent vegetation subsampling in the DARSA (19 percent absolute cover) the 249.90 acres of desert dry wash woodland occurring within the Reconfigured Alternative DARSA is composed of 47.48 acres of wash-dependent vegetation (Attachment 3). The 47.48 acres absolute cover of wash-dependent vegetation is a separate component of the desert dry wash woodland, which is distributed throughout the 191.17 acres of vegetated ephemeral dry wash and 11.25 acres of riparian interfluves occurring within the disturbance area (Table 12).

C. Qualitative Functions and Values Assessment

A qualitative assessment of the functions and services of the ephemeral stream features (composed of two types of aquatic features [e.g., desert dry wash woodland and unvegetated ephemeral dry wash]) and vegetated swales supporting desert dry wash-dependent (or desert dry wash obligate) species potentially directly and indirectly impacted by the proposed BSPP were evaluated as riverine.[37] Although the vegetated desert aquatic features and swales are not populated by hydrophytic plant species they are populated by ephemeral wash obligate plant species that can be considered to provide functions and values as wetland within an arid or semi-arid landscape (Lichvar and Field 2007).[38]

Wetland (or in this case xeric riparian) functions can be defined as the physical, chemical, and biological processes occurring in and making up an ecosystem (Mitsch and Gosselink 2007) and a process or series of processes that take place within a wetland (USGS 1996). Wetland values can be defined as the goods and services perceived as beneficial or valuable to society that emanate directly or indirectly from wetland functions (Batzer and Sharitz [eds.] 2006) and "an estimate, usually subjective, of worth, merit, quality, or importance" to people (Richardson 1994).

[37] "Riverine" refers to a class of wetland that has a floodplain or riparian geomorphic setting [Brinson et al. 1995]). Riverine class does not apply to the vegetated swale features.

[38] Ephemeral streams are the predominant fluvial environment in arid and semi-arid regions and current understanding of dryland riparian ecology is derived primarily from perennial stream environments (Shaw and Cooper 2008).

This qualitative assessment of xeric riparian functions and values utilized the Hydrogeomorphic Approach (HGM) to assess the physical, chemical, and biological functions and values of desert dry wash woodland, unvegetated ephemeral dry wash, and vegetated swales supporting wash-dependent vegetation utilizing a synthesis of the methodologies and definitions outlined in:

- *A Hydrogeomorphic Classification for Wetlands* as a guide (Brinson 1993)
- *An Approach for Assessing Wetland Functions Using Hydrogeomorphic Classification, Reference Wetlands, and Functional Indices* (Smith et al. 1995).
- *Wetland Values: Concepts and Methods for Wetlands Evaluation* (USACE 1979).
- *The Ecological and Hydrological Significance of Ephemeral and Intermittent Streams in the Arid and Semi-arid American Southwest* (USEPA 2008).
- USEPA Watershed Academy: *Wetland Functions and Values* (USEPA 2009b).
- USGS Water Supply Paper 2425: *Wetland Functions, Values, and Assessment* (USGS 1996)

This qualitative functions and values assessment is based on observations made during the jurisdictional delineation field surveys and other resource surveys (e.g. cultural, botanical, and wildlife). This assessment is intended to quantitatively evaluate desert aquatic features without a reference site. Since this assessment is not based on a comparison to an actual reference site in the field, the qualitative rankings of variables used for the assessment of the quality of functions and values was confined to the quality of the habitats within the study area. Ephemeral stream functions are summarized in Table 13 and ephemeral stream values are summarized in Table 14. The following text explains these conclusions.

Using Brinson (1993), Smith et al. (1995), and USEPA (2008) as the primary guidance documents for assessing xeric riparian function, the qualitative HGM assessment for the riverine system occurring within the DARSA will be identified by four major functional categories:

1. Hydrologic Function,
2. Biogeochemical Function,
3. Plant Habitat Function, and
4. Animal Habitat Function.

Table 13
Ephemeral Stream Functions and Functional Status of Established washes and Ancillary Ephemeral Drainage Features [a]

Function	Functional Status for Vegetated Ephemeral Dry Wash	Functional Status for Unvegetated Ephemeral Dry Wash	Functional Status for Wash-dependent Vegetated Swales
Hydrologic Function	High	High	Medium to High
Biogeochemical Function	High	Medium to Low	Medium to High
Plant Habitat Function	High	Medium to Low	Medium to High
Animal Habitat Function	High	Medium to High	Medium to Low

[a] Qualitative criteria used to determine High, Medium, or Low functional status.
HIGH – Ephemeral stream and/or swale is functioning at a high level and represents the top 25 percent of its class.
MEDIUM – Ephemeral stream and/or swale is functioning but due to site-specific factors and/or disturbance is not functioning at potential functional capacity.
LOW – Ephemeral stream and/or swale is providing some functions, but due to landscape context and/or past disturbances is functioning well below potential functional capacity.

Table 14
Ephemeral Stream Values and Value Status of the Established washes and Ancillary Ephemeral Drainage Features [a]

Value	Value Status for Vegetated Ephemeral Dry Wash	Value Status for Unvegetated Ephemeral Dry Wash	Value Status for Wash-dependent Vegetated Swales
Aquifer Recharge/ Water Supply	High	High	Low
Flood Protection	Low	Low	Low
Water Quality	High	High	Medium to High
Economic	Medium to Low	Low	Low
Aesthetic	High	Medium to High	Medium to Low
Recreational	Medium	Medium	Low
Cultural	Medium to Low	Medium to Low	Medium to Low
Habitat	High	Medium	Medium

[a] Qualitative criteria used to determine High, Medium, or Low functional status.
HIGH – Ephemeral stream and/or swale provides recognizable values accepted as important or priority driven for people.
MEDIUM – Ephemeral stream and/or swale provides recognizable values due to site-specific factors; however, values are not considered as important or a priority for people.
LOW – Ephemeral stream and/or swale is providing some values, but due to inherent low functions and/or past disturbances values is considered low by people.

The xeric riparian values 1 through 4 will be incorporated within the xeric riparian functions because wetland values also arise from the many ecological functions associated with wetlands (USEPA 2009). Using USEPA (2009b), USGS (1996), and USACE (1979) as the primary guidance documents for assessing, xeric riparian values for the riverine system occurring within the DARSA will be identified by seven major value categories:

1. Aquifer Recharge (including Base Flow and Water Supply),
2. Flood Protection,
3. Water Quality,
4. Economic,
5. Aesthetic,
6. Recreational, and
7. Cultural.

Xeric riparian values 5 through 7 were ascertained through subjective review during the jurisdictional delineation field assessment; a review of related documents such as cultural resources reports (EDAW 2009b), the Riverside County General Plan (Riverside County 2003), and the City of Blythe Municipal Code (City of Blythe 2008); and speaking with resource agency personnel (AECOM 2009b).

Hydrologic Function

Dynamic Surface Water Storage

This function refers to the capacity of a wetland to detain moving water from overbank flow for a short duration when flow is out of the channel and is associated with moving water from overbank flow and/or upland surface water inputs by overland flow or tributaries. The longer water is detained as it moves through the riparian system, the greater the potential for the riparian system to develop and to support other wetland functions. The movement of water through a wetland during an overbank flow event is controlled by width slope and roughness of the area inundated (Brinson et al. 1995).

Within the DARSA, the short-duration rainfall events of the region and relatively low amount of hydrology indicators observed and documented outside the drainage features would suggest that the riparian habitat within the established washes and smaller drainage features has a low function for dynamic surface water storage. However, channels of the established washes located in the northwest portion of the survey area are well defined and are up to 30 feet deep and support a visible thalweg or depressional features, which can contribute to limited short term water storage.

Outside of the bankfull point of the majority of the smaller and shallower developed channels within the DARSA, indicators associated with frequent overbank flooding (such as ancillary

channels, unvegetated surfaces, and a break in slope) are relatively well developed. Ephemeral streams do experience extreme and rapid variations in flood regime (USEPA 2008). However, most arid and semi-arid region rivers are characterized by long periods without flow and only support overbank flow during the infrequent flash flooding events, which does not contribute to surface water storage because of the relatively short duration of a flooding event (Lichvar and McColley 2008; Baker et al. 2004). Wash-dependent vegetation populates a majority of the interfluves (or vegetated island terraces) occurring in, and within the outer banks of, the established ephemeral channels (all of which are composed of sandy soils that present high infiltration rates). The established wash obligate species located throughout the major wash presenting a developed overstory and developed and persistent herbaceous understory indicate some function of short-term water storage occurring within the portion of channels supporting desert dry wash woodland. Based upon the pattern of vegetation occurring within the established washes, these developed channels and extensive riparian interfluves are likely to have the potential to store water or discharge damaging flows more so than ephemeral streams without developed channels and vegetated interfluves. This function is a result of slowing down the velocity of surface water, during storm events (University of New Mexico 1997), resulting in a medium to high function for dynamic surface water storage for the desert dry wash woodland and a low function for dynamic surface water storage for the unvegetated ephemeral dry wash occurring within the survey area. The swales within the survey area are underlain by a sandy substrate and convey low-volume and short-duration flow, which does not create overbank flow within the swale feature and, thus, do not have the capacity for short-term water storage in arid climates.

Long-term Surface Water Storage

This function refers to the capability of a wetland to temporarily store (retain) surface water for long durations, associated with standing water not moving over the surface. Water sources may be overbank flow, overland flow, and/or channelized from uplands, or direct precipitation. Long-term storage of surface water can have adverse ecological consequences, such as diminishing gas exchange between soil and atmosphere, prohibiting the germination of seeds, or leading to prolonged soil saturation, but it can also have some benefits, such as providing support for aquatic vertebrates and invertebrates (Brinson et al. 1995).

Within the DARSA, there was very little evidence of long-term storage of surface water. Due to the arid climate and generally sandy texture of the soils occurring within the DARSA, it is assumed that long-term surface water storage is minimal and has minimal potential for occurring,

resulting in a low function for long-term surface water storage in the desert dry wash woodland, unvegetated ephemeral dry washes, and vegetated swales occurring within the survey area.

Subsurface Water Storage

This function is the availability of water storage beneath the wetland (or vegetated) surface; storage capacity becomes available due to periodic drawdown of the water table. The absorption and storage of water below-ground can reduce the depth of wetland inundation and slow the release of water to the riverine feature (Smith et al. 1995). The ability of soils to absorb and hold water for long periods favors the survival of plant species that can most adapt to short periods of saturation. Because of the smaller size of the pores, clay soils possess a lower capacity to store water than sandy soils. Soils saturated to the surface or ponded for long periods of time have little or no potential for subsurface storage (Brinson et al. 1995).

Within the DARSA it is assumed that groundwater is recharged largely by infiltration of floodwaters that directly enter the stream channels along the mountain front and from infiltration through the McCoy Wash. Sediment below ephemeral channels does convey water (USEPA 2008) as rainfall and floodwaters also influence the hyporheic zone[39] of the active channel(s) of ephemeral streams (Baker et al. 2004). The soils encountered within the riparian communities are sparsely vegetated sands or sandy loams, which have a high potential for infiltration and subsurface storage of floodwaters. During heavy and prolonged inundation events, the soils in both the desert dry wash woodland and unvegetated ephemeral dry wash within the DARSA would support the hyporheic zone and present a high function for subsurface water storage. The vegetated swales support and present low-volume, short-duration flow, which would present low functions and values for subsurface water storage.

Moderation of Groundwater Flow, Recharge, or Discharge

This function is the capacity of a wetland to moderate the rate of groundwater flow or discharge from upgradient sources or from groundwater discharge within a wetland. Riverine wetlands usually form along low-gradient reaches of streams, resulting in relatively low rates of subsurface flow through the wetlands (Brinson et al. 1995). However, groundwater recharge in ephemeral stream channels can be significant in some years and negligible in others (USEPA 2008).

[39] The hyporheic zone is the area between the (usually dry) surface of an ephemeral stream and alluvial ground water. The hyporheic zone is important to the physical, chemical, and biological integrity of the above-ground portion of the stream because, in this zone, there is substantial biogeochemical cycling of nutrients and trace elements that are essential to aquatic adapted life (USEPA 2008).

Within the DARSA, though this function could not be assessed by any direct observation made in the field, it is assumed that there would be moderate to high subsurface flow due to the presence of the established washes and other drainage features. These ephemeral stream features within the DARSA, consisting of desert dry wash woodland and unvegetated ephemeral dry wash, indirectly contribute to the Palo Verde Mesa Groundwater Basin, which would be considered a moderate function for the moderation of groundwater flow, recharge, or discharge. The vegetated swales support and present low-volume, short-duration flow, which would present low functions and values for the moderation of groundwater flow, recharge, or discharge. Direct precipitation and minor flow events within swale features do not likely contribute to groundwater recharge.

Landscape and Hydrologic Connection and Buffer Conditions

Watersheds and their surrounding ecosystems are linked by the flow of water. In a watershed context, landscape hydrologic connectivity refers to the maintenance of natural hydraulic connections of surface and subsurface flow between source, headwater, or contributing areas and downstream/down gradient receiving waters (Smith et al. 1995). In arid land streams, this hydrologic connection occurs episodically during flood pulses, yet still provides a substantial amount of the mass, momentum, energy, and organisms delivered to downstream perennial waters, as well as to groundwater recharge (Lichvar and McColley 2008).

Within the DARSA, landscape connectivity between the washes and their natural flow patterns toward the McCoy Wash and I-10 to the southeast and off site are generally affected by the primary obstructions to surface flow—agricultural and commercial 20-foot-high berms constructed downstream of the ephemeral washes to divert stormwater away from farming operations and the Blythe Airport. The Blythe Airport, an approximately 300-acre solar field, dirt roads, limited agriculture, and I-10 are within a 2-mile buffer of the DARSA. However, the majority of surface flow and swale development occur unobstructed until abatement into the landscape. Therefore, landscape and hydrologic connection and buffer condition can be considered as a high function for the desert dry wash woodland and unvegetated ephemeral dry wash within the survey area. The vegetated swales have a direct relation to the larger established washes and present a high function and value for landscape, hydrologic connection, and buffer condition.

Energy Dissipation

Energy dissipation refers to the transformation and/or reduction in the amount of kinetic energy of flowing water, which is a function of channel roughness, channel morphology, and buffer and landscape vegetation. Stream energy dissipation is important for the prevention of channel erosion and scour, and increased sediment loads that can degrade water quality (Lichvar and McColley 2008).

Within the DARSA, drainage patterns and sediment depositions (containing a wide range of sediment sizes) occurring within the established washes indicate that associated surface flows (including flood pulses) contain heavy sediment loads and have the ability to transport large amounts of sediment through the stream system generally unobstructed or altered. The established washes present decreased flow rates in the downstream direction, reducing both flow volume and velocity, where they develop into swale features or abate into the landscape. Sediment deposited during flow events can encourage plant germination by providing seed beds and scarifying seeds, but it also can inhibit the growth of seedlings or some types of vegetation, such as nonnative saltcedar (*Tamarix* spp.) (Lichvar and McColley 2008). Energy dissipation for the desert dry wash woodland and unvegetated ephemeral dry wash within the DARSA can be considered as a high function. By virtue of their developed network, energy dissipation for the vegetated swales within the DARSA can be considered as a high function.

Summary for Hydrologic Functions and Values

The established washes and ancillary drainage features are the major fluvial systems occurring within the survey area. Based upon periodic ephemeral flow they present the potential for aquifer recharge during storm events. The vegetated swales are part of the minor fluvial system, which does not present a significant potential for aquifer recharge. However, the vegetated swales present high functions and values for surface water quality (USEPA 1999). The ephemeral washes are not developed enough to abate flooding in severe storms. However, these xeric riparian habitat (including unvegetated portions of the ephemeral washes and swale features and swale networks) can intercept runoff and slow down the velocity of surface water and potentially remove or transform pollutants through physical, chemical, and biological processes, thereby improving water quality.

Biogeochemical Function

Nutrient Cycling

This function involves abiotic and biotic processes that convert elements from one form to another, primarily recycling processes. Cycling of nutrients is a fundamental ecosystem process and nutrient cycling is mediated by two variables: net primary product ion, in which nutrients are taken up by plants; and detritus turnover, in which nutrients are released for renewed uptake by plants. Nutrient cycling can be assessed by estimating the living and dead biomass through assessments of vegetation cover and detritus cover (Brinson et al. 1995). A high density of standing living trees, shrubs, and, in certain areas, herbaceous plant cover, would indicate high primary production. Ephemeral stream vegetation also influences biogeochemical cycles by providing leaf litter, and food and cover for wildlife. In some cases, vegetation can intercept rainfall, preventing it from infiltrating into the soil, and influencing the local water balance and ecosystem processes (USEPA 2008). A high amount of living biomass is an indicator that nutrient uptake processes are occurring (Brinson et al. 1995). Because large amounts of material are only moved into larger streams during extreme rainfall events, much of the nutrient cycling may occur in the smaller streams (USEPA 2008).

Within the DARSA, the established washes are ephemeral fluvial systems that are driven by pulse inputs of water. The desert dry wash woodland observed within and encompassing the braided channels of established washes presents a relatively high amount and input of leaf litter and woody debris on the forest floor and would be indicative of high nutrient uptake rates and nutrient cycling. Periodic flows in ephemeral or intermittent channels have a strong influence on biogeochemistry by providing a connection between the channel and other landscape elements by eventually transmitting a substantial amount of organic and inorganic material into downstream perennial waters (where it is an important component of perennial food web) (USEPA 2008). Because of no excess nutrient input and major surface and/or groundwater disruption between the ephemeral streams and their flow path occurring in the Imperial Reservoir Watershed and both organic and inorganic material inputs from the McCoy Mountains, it is assumed that the desert dry wash woodland has a high function for nutrient cycling and the unvegetated ephemeral dry wash has a moderate function for nutrient cycling. The vegetated swale features and networks supporting low-volume and short-duration flow present a moderate to low function and value for nutrient cycling. However, swales can support nutrient retention (Kennedy 2001).

Removal of Imported Elements and Compounds

This function is the removal of imported nutrients, contaminants, and other elements or compounds. This is especially germane to impervious surfaces contributing to pollution inputs and erosion increases. Brinson et al. (1995) defined the term "removal" to imply the relatively long-term accumulation or permanent loss of elements and compounds from incoming water sources. Three groups of variables—water sources, soil properties, and uptake by vegetation—are equally important in maintaining this function. Woody plants are important because they may detain elements for longer than 1 year because they are perennial, and woody parts tend to decompose slowly. Soils that have fine texture have greater absorption capacities than those with coarse textures. Limited overbank flow allows for waterborne materials in streams to be removed by biogeochemical processes operating on the floodplain (USEPA 2008). Surface and subsurface flow from uplands into the riparian area also influences the amount of imported nutrients reaching the wetlands that would be available for uptake and removal. Microtopographic complexity will expose water simultaneously to a variety of conditions at any one time. Microbial activity is associated with complex surfaces, such as leaf litter, humus and soil particles, and plant surfaces.

Within the DARSA the desert dry wash woodland is composed of long-lived perennial woody species (dominant as overstory) and persistent herbaceous understory. This established desert dry wash woodland "removes" elements from the system (i.e., incorporates them into biomass) for long periods of time. This would be offset somewhat by the sandy soils of the survey area and their high infiltration rates and low nutrient adsorption ability. Additionally, the presumably relatively high microbial activity would also contribute to the removal of elements and compounds from water sources, and their conversion and incorporation into biomass for the relatively long term. The drainage features present moderate biogeochemical functions as they are ephemeral in nature. However, although moderate in absolute terms, the removal of imported elements and compounds can be considered a high function for desert dry wash woodland and the unvegetated ephemeral dry wash would have a relatively low function and value for the removal of imported elements and compounds. The vegetated swale features and networks supporting low-volume and short-duration flow present a moderate to low function and value for the removal of imported elements and compounds and a high function and value for the removal of imported elements and compounds during storm events (USACE 1999).

Retention of Particulates

This function is the deposition and retention of inorganic and organic particulates (>0.45 µm) from the water column, primarily through physical processes. Once waterborne sediment has been transported to a floodplain, velocity reduction normally occurs due to surface roughness and an increasing cross-sectional area of discharge. This leads to a reduction in the capacity of water to transport suspended sediments, so particulates settle. Sediment accumulation contributes to the nutrient capital of an ecosystem. Deposition increases surface elevation and changes topographic complexity. Organic matter may also be retained for decomposition, nutrient recycling, and detrital food web support. Overbank and surface inflow (i.e., overland flow) are important for transporting sediments to xeric riparian communities. The "roughness" of the vegetation, microtopographic complexity, and amount of woody debris will all reduce the capacity of flows to transport suspended sediments and allow for these sediments to settle out in the xeric riparian area rather than being transported off site (Brinson et al. 1995; Smith et al. 1995; USEPA 2008).

Within the DARSA, the established ephemeral channel(s) presented indications of deposited coarse-grained materials and cobble and past surface flow from drift lines and sediment deposits throughout the riparian habitats in the survey area, as well as the high amount of vegetation cover or "roughness" and microtopographic complexity (series of riparian and upland interfluves). These field indicators of desert aquatic resources would suggest that the desert dry wash woodland within the survey area has a relatively high function and value for the retention of particulates and the unvegetated ephemeral dry wash would have a relatively low function and value for the retention of particulates. The vegetated swale features and networks supporting low-volume and short-duration flow present a moderate to low function and value for the retention of particulates and a high function and value for the retention of particulates during storm events (USACE 1999).

Organic Carbon Export

This function is the export of dissolved and particulate organic carbon from a wetland. Mechanisms include leaching, flushing, displacement, and erosion (USEPA 2008). The removal of organic matter from living biomass, detritus, and soil organic matter contributes to decomposition. Organic carbon export provides support for aquatic food webs and biogeochemical processing downstream of the wetland (Brinson et al. 1995). Many of the variables important for retention of particulates, such as frequency of overbank flow, surface inflow, and subsurface inflows, are important for exporting carbon. Other variables include

surface hydraulic connections with the channels (through drainage features and surface runoff [sheetflow]) and organic matter within the riparian wetlands. These hydraulic connections are important for short-distance transport. Leaf litter, woody debris, soil organic matter, and leaching of plant material during precipitation from throughfall and stemflow result in high concentrations of dissolved organic carbon (Brinson et al. 1995).

Within the DARSA, organic carbon export would likely be low concerning the drainage features by virtue of their ephemeral nature. However, being connected only during flood events, organic carbon exchange/export occurring between the desert dry wash woodland and unvegetated ephemeral dry washes should be considered relatively high. The vegetated swale features and networks supporting low-volume and short-duration flow present a moderate function and value for organic carbon export because of uptake by wash obligate vegetation.

Summary for Biogeochemical Function

The xeric riparian areas potentially provide a sink for nutrients, organic compounds, metals, and components of organic matter. The desert dry wash woodland may also act as filters of sediments and organic matter. The xeric riparian areas may be a permanent sink for these substances. The inputs of detritus within the wash presents basic energy inputs at an ecosystem level for biochemical processes, nutrient cycling, and elemental import/export processes, which for desert dry wash woodland, are also functioning at a relatively high value level in comparison with the surrounding upland areas. The unvegetated ephemeral dry washes lack established wash obligate vegetation for additional organic and inorganic inputs and uptake. Therefore, the unvegetated ephemeral dry washes are likely functioning at a relatively moderate to low level. The vegetated swale features and networks supporting low volume and short-duration flow present a moderate to low function and value for biogeochemical function and a high function and value for the retention of particulates during storm events (USACE 1999).

<u>Plant Habitat Function</u>

Plant Community Composition

Desert washes are easily recognizable by their dense corridor of vegetation that is in strong contrast to the more sparsely vegetated uplands (USEPA 2008). Xeric riparian wetlands can be evaluated to determine how plant community characteristics are maintained, including both species composition and the physical characteristics of living plant biomass. The emphasis is on the dynamics and structure of the plant community as revealed by the species of trees, shrubs,

seedlings, saplings, and herbs, and by the physical characteristics of the vegetation. This function converts solar radiation and carbon dioxide into complex organic compounds that provide energy to drive food webs, provide seeds for regeneration, provide habitat for wildlife, create microclimatic conditions essential for a number of plant and animal species, create roughness that reduces the velocity of floodwaters, and provide organic matter for soil development and nutrient cycling. The goal of assessing this function is to evaluate species composition and structure of xeric riparian plant communities to determine their successional status. If the site is dominated by species other than those characteristic of mature stands within the area or region, it is likely that the site has been disturbed by natural or anthropogenic events. Variables used to assess this function include species composition for all strata, regeneration of species, canopy cover, shrub (and tree) density, and basal area (Brinson et al. 1995).

Within the DARSA, the extensive portions of the established washes are occupied by a relatively large desert dry wash woodland vegetation community. Blue palo verde, smoke tree, and ironwood are the dominant overstory and indicator plants of the desert dry wash woodland community. Desert dry wash woodland obligate plants composing the understory are desert starvine, desert lavender, big galleta grass, and honey mesquite. The understory of the desert dry wash woodland is also intermixed with Sonoran creosote bush scrub within the vegetated portions of the established washes and smaller ephemeral tributaries. Understory plants, occurring in patches, within the ephemeral washes are smaller shrubs and annuals commonly composed of include creosote bush, burro-weed (*Ambrosia dumosa*), brittlebush (*Encelia farinosa*), cheesebush (*Hymenoclea salsola*), desert sunflower (*Geraea canescens*), desert lily (*Hesperocalus undulata*), and ocotillo (*Fouquieria splendens*) (EDAW 2009a). The vegetated swales are primarily occupied by the Creosote - Big Galleta Grass Association, which is considered a special community type by CDFG (CDFG 2003). These vegetated swales present established plant diversity primarily based upon access to water. The woody wash obligate overstory vegetation (in addition to the other components of desert dry wash woodland) can provide structural elements of food, cover, nesting and breeding habitat, and movement/migration corridors for wildlife that are not as available in the adjacent upland. Functional services of these communities include moderating soil and air temperatures, stabilizing channel banks and interfluves, seed banking and trapping of silt and fine sediment favorable to the establishment of diverse floral and faunal species, and dissipating stream energy, which aids in flood control (USEPA 2008). It is assumed that natural processes are contributing to a relatively self-sustaining xeric riparian vegetation community, and plant community composition in the desert dry wash woodland can be considered a high function. Plant community composition within the unvegetated ephemeral dry wash would have a relatively low

function and value. Vegetated swales and networks would present moderate to high functions and value for plant community composition.

Plant Habitat Spatial Structure

Maintaining spatial structure of habitat is the capacity of a wetland to support animal populations and guilds by providing heterogenous habitats. During seasonal dry periods, plant species diversity levels along ephemeral stream channels typically are low. However, during seasonal wet periods, diversity levels along some ephemeral stream channels can equal that along perennial stream channels (Lichvar and McColley 2008). Plant habitat spatial structure function is designed to assess the suitability of vegetation structure for sustaining animal populations. The important variables to assess this function include density of and diversity of vertical vegetation strata, vegetation patchiness, and canopy gaps (Brinson et al. 1995). The time required for desert wash habitats to progress through successional stages is not known, but probably depends on water availability (e.g., precipitation, groundwater). Stand development ultimately depends on water supply and other site characteristics. In very dry areas, stands may persist as underdeveloped stages (e.g., medium tree/shrub stage) rather than progressing to the large tree stage (CDFG 1988).

Within the DARSA, plant production is higher in the ephemeral steam areas and swale networks (EDAW 2009a; AECOM 2009b). The portions of established washes and smaller ephemeral tributaries considered as desert dry wash woodland support an approximately 19 percent absolute cover. The patchiness in the desert dry wash woodland appears to be affected by flow regime, which rapidly changes once the established washes are below the foothills of the McCoy Mountains. Sonoran Desert plants comprising desert wash habitats generally are taller and denser than those of surrounding desert habitats (CDFG 1988). Desert dry wash woodland appears much denser and restricted to the established deeper channels. Within the DARSA, the low frequency of surface flow is the primary facilitator in the spatial dispersal of plant propagules. However, in places where desert dry wash woodland is established there is a higher diversity of plant species than in the surrounding upland vegetation communities, which can be considered as having a relatively high function for maintaining plant spatial structure. Maintaining plant spatial structure within the unvegetated ephemeral dry wash would have a relatively low function and value. Vegetated swales and networks would present moderate to high functions and values for plant habitat spatial structure.

Summary for Plant Habitat Function

The ephemeral washes and vegetated swale networks provide habitat for establishment of more developed plant diversity and developed spatial structure because of access to water relative to upland areas. The diversity of plants also provides habitat to special status species (see below). Desert dry wash woodland and vegetated swales would present high functions and values for plant habitat function and unvegetated ephemeral dry wash would present moderate to low functions and values for plant habitat function.

Animal Habitat Function

Habitat Interspersion and Local Wildlife Movement

Because ephemeral and intermittent stream channels have a higher moisture content and more abundant vegetation than the surrounding areas, they are important to wildlife. Frequently, these streams may retain the only available water in the area, with perennial segments or permanent pools interposed wherever hydrogeological conditions allow (USEPA 2008). The habitat provided by desert streams contracts and expands dramatically in size due to the extreme variations in flow, which can range from high-discharge floods to periods when surface flow is absent. This spatial variation in habitat or ecosystem size is a fundamental, defining feature of these streams (Smith et al. 1995; USEPA 2008). The animal habitat function of xeric riparian wetlands focuses on evaluating the capacity to which habitat interspersion and local wildlife movement are maintained, thereby permitting aquatic organisms to enter and leave the wetland via permanent or ephemeral surface channels, overbank flow, or unconfined gravel aquifers. This function also measures the capacity of the wetland to permit access to terrestrial or aerial organisms to contiguous areas of food and cover. This function provides habitat diversity and contributes to secondary production and complex trophic (relating to food source/nutrition) interactions, as well as provides corridors for migratory species, and refugia (suitable habitat for relict/native species) for plants and animals. Variables important for evaluating this function include frequency and duration of overbank flow; microtopographic complexity; surface and subsurface hydraulic connections; and contiguous vegetation cover and/or corridors between upland and wetlands, and upstream and downstream areas (Brinson et al. 1995).

Within the DARSA, the short duration and episodic flood pulses of surface and overbank flow is important in permitting organisms sufficient time to access riparian habitat and allow some species to complete important life-history developmental stages. The desert wash habitats occurring within the DARSA are adjacent to several different desert habitats. Microtopographic

complexity within the established washes is important for contributing to the interspersion of habitat types and connections between the ephemeral stream and floodplain. Surface and subsurface hydraulic connections allow for an interspersion among habitat types and conduits for movements of terrestrial animals and aquatic organisms. Vegetation cover between uplands and riparian areas allows for wildlife movement between these communities. The xeric riparian areas (e.g., desert dry wash woodland) of the established washes present a local habitat corridor, which can be used for cover and food between the surrounding uplands and can be considered as presenting a high function for local habitat interspersion and local wildlife movement. However, these washes do not support regional connectivity. Local habitat interspersion and local movement for the unvegetated ephemeral dry wash would have a relatively moderate to low function and value. Local habitat interspersion and local movement for the swales would have a relatively moderate to high function and value as the swales directly connect the established washes with upland areas.

Distribution and Abundance of Invertebrates

The abundant invertebrates associated with ephemeral, intermittent, and headwater tributaries are important contributions to the biological integrity of river networks. Ephemeral streams contain rich assemblages of both invertebrates and macroinvertebrates (USEPA 2008). Maintaining distribution and abundance of invertebrates is the capacity of the xeric riparian area to maintain the density and spatial distribution of invertebrates (aquatic, semi-aquatic, and terrestrial). This function is assessed through an evaluation of invertebrates in the soil leaf litter and woody debris, and aquatic habitats (Brinson et al. 1995).

Within the DARSA, no invertebrate and macroinvertebrate surveys were conducted. However, it is assumed that desert dry wash woodland, in its current state, provides adequate food sources for a high number and diversity of invertebrates and macroinvertebrates and can be considered as presenting a high function for the distribution and abundance of invertebrates within both the vegetated and unvegetated portions of the ephemeral washes. It is likely that the vegetated swales and swale networks present a moderate function and value for the distribution and abundance of invertebrates (primarily in the form of insect migration.

Distribution and Abundance of Vertebrates

Maintaining distribution and abundance of vertebrates is the capacity of the xeric riparian area to maintain the density and spatial distribution of vertebrates (aquatic, semi-aquatic, and terrestrial). This function is assessed through an evaluation of the distribution and abundance of resident and

migratory fish, reptiles, resident and migratory birds, and permanent and seasonally resident mammals (Smith et al. 1995).

There are numerous washes meandering eastward into the project site from the McCoy Mountains west of the Combined Survey Area. Wildlife using the washes include coyote (*Canis latrans*), fox (desert kit fox [*Vulpes macrotis arsipus*] or gray fox [*Urocyon cinereoargenteus*]), bobcat (*Lynx rufus*), domestic dog (*Canis familiaris*), DT, woodrat (*Neotoma* sp.), and wild burros (*Equus asinus*). These washes likely function as local corridors for wildlife species to move between the valley floor and McCoy Mountains to the west, since they provide additional cover as compared to adjacent upland areas. The upland areas between the washes have very little vegetation and most of the vegetation present in the Combined Survey Area is in the washes. The washes have also created ravines that provide added cover for wildlife. Although these washes are used locally for movement, they are likely less important to regional movement due to the wide agricultural corridor along the Colorado River to the east and the presence of the I-10 highway corridor to the south.

Within the DARSA, there was ample evidence of the presence of vertebrates occurring within the ephemeral washes (e.g., tracks and scat) and using them as a habitat corridor. Sonoran creosote bush scrub, desert dry wash woodland, and unvegetated ephemeral dry wash communities within the survey area are considered suitable burrowing owl (*Athene cunicularia*) foraging and nesting habitat (EDAW 2009c). Desert tortoise (*Gopherus agassizii*) will be present in higher densities associated with drainages, swales, mountainous areas, and alluvial fans. Annual and perennial plant production is higher in these areas and is longer lasting. Additionally, when water is available, it is in closer proximity to the desert tortoise if their home ranges are associated with a drainage as the desert tortoise will have more available water and for a longer period if closer to a drainage. Water in the desert should also be generally more abundant in the mountainous areas than within the valley floor (due to evapotranspiration and orographic effects), which is why desert tortoise are often found in the mountains (CDFG 2009). The survey area is located in the Sonoran Desert. Temperatures here are generally higher than the Mojave Desert and water is less available at lower elevations. In the Mojave, desert tortoise is often observed in valley floors. However, desert tortoise in Sonoran populations will be higher associated with drainages (EDAW 2009d). Desert dry wash woodland would present high functions and values for the distribution and abundance of vertebrates and unvegetated ephemeral dry wash would present a moderate to high function and value for the distribution and abundance of vertebrates. The vegetated swales and swale complex would provide moderate functions and values for the distribution of vertebrates by providing habitat opportunity as cover in relation to the surrounding expanses of desert pavement.

Summary for Animal Habitat Function

The xeric riparian areas and unvegetated ephemeral dry wash occurring within the survey area support an integral role in the ecology of the watershed. The ephemeral washes (both vegetated and unvegetated) and vegetated swale networks provide habitat, local movement corridors, and refuge to animals. Overall, desert dry wash woodland can be considered to provide high functions and values for animal habitat, unvegetated ephemeral dry wash provides moderate to high functions and values, and vegetated swale networks provide moderate to low functions and values.

VII. DISCUSSION

A. Potential Impacts

Both upstream[40] and downstream[41] potential jurisdictional waters of the State have been delineated to identify any desert aquatic features occurring outside of the Project Disturbance Area or Reconfigured Alternative Disturbance Area that may be indirectly impacted by the Proposed Project or Reconfigured Alternative.

Project Disturbance Area

The Proposed Project would result in permanent direct impacts (inside the Project Disturbance Area) resulting from construction activities (including grading, staging, and where all proposed Project components would be built and placed) of approximately 205.60 acres of waters of the State. The Proposed Project would also result in permanent indirect impacts (outside or downstream of the Project Disturbance Area) of approximately 137.83 acres of waters of the State. Project-specific potential impacts (both permanent direct and permanent indirect) toward each type of potential jurisdictional waters as a result of the Proposed Project are approximately 343.42 acres and are listed in Table 15.

[40] Most likely, upstream washes would not be impacted. Downstream waters containing wash-dependent vegetation would likely be indirectly impacted by the rerouting of the onsite washes; the Revised Supplemental Biological Survey Report (AECOM 2009c) will evaluate these impacts. The determination for some washes will rely on hydrologic studies, which are still in progress.

[41] The downstream desert aquatic features have been delineated outside the DARSA but are considered as part of the delineation based upon potential indirect impacts. Downstream desert aquatic features have been delineated until they either abate into the landscape or connect with desert aquatic features.

Table 15
Potential Impacts to Potential Jurisdictional Waters of the United States and State Occurring within the Project Disturbance Area[a]

Form of Jurisdictional Waters of the State	Regulatory Authority	Direct Impacts *Inside Project Disturbance Area*	Indirect Impacts *Hydrologically Connected Downstream*	Total Impact Area
Xeric Riparian Extent	CDFG, RWQCB	197.04	137.49	334.53
Unvegetated Washes	CDFG, RWQCB	8.56	0.33	8.89
Total		**205.60**	**137.83**	**343.42**

[a] Acreage of all jurisdictional waters was determined by utilizing the GIS program ArcGIS. All acreages are rounded to the nearest hundredth.

Reconfigured Alternative Disturbance Area

The Reconfigured Alternative would result in permanent direct impacts (inside the Reconfigured Alternative Disturbance Area) resulting from construction activities (including grading and where all proposed solar blocks and related components[42] will be built and placed) of approximately 176.28 acres. The Reconfigured Alternative would also result in permanent indirect impacts (outside or downstream of the Reconfigured Alternative Disturbance Area) to approximately 71.74 acres. Specific potential impacts related to the Reconfigured Alternative (both permanent direct and permanent indirect) toward each type of potential jurisdictional waters are approximately 248.02 acres and are listed in Table 16.

Table 16
Potential Impacts to Potential Jurisdictional Waters of the United States and State Occurring within the Reconfigured Alternative Disturbance Area[a]

Form of Jurisdictional Waters of the State	Regulatory Authority	Direct Impacts *Inside Disturbance Area*	Indirect Impacts *Hydrologically Connected Downstream*	Total Impact Area
Xeric Riparian Extent	CDFG, RWQCB	171.32	71.15	**242.47**
Unvegetated Washes	CDFG, RWQCB	4.96	0.59	**5.55**
Total		**176.28**	**71.74**	**248.02**

[a]Acreage of all jurisdictional waters was determined by utilizing the GIS program ArcGIS. All acreages are rounded to the nearest hundredth.

[42] The Reconfigured Alternative Disturbance Area encompasses the disturbance caused by construction of the solar power blocks only.

B. Requisite Permitting for Impacts

For any proposed activity that could affect (impact temporarily and permanent) waters of the State, but do not affect Federal waters, issuance of the following permits by the requisite State resource agencies are required.

CFGC Section 1602 Lake and Streambed Alteration Agreement

CDFG regulates activities that would alter the flow, bed, channel, or bank of streams and lakes. As conditional to this permit, mitigation will be required. Mitigation for unavoidable permanent impacts to jurisdictional waters within the Project Disturbance Area or the Reconfigured Alternative Disturbance Area could be mitigated via a combination of methods. The mitigation could occur in the form of approved mitigation bank credits, an approved in-lieu fee program, conservation easement(s), and/or jurisdictional habitat creation-restoration (that results in a net increase in jurisdictional habitat acreage), enhancement, or creation-restoration combined with enhancement; however, the mitigation could not result in a net loss of jurisdictional habitat or wetland functions and values. Project compliance with State policy, i.e., California Wetlands Conservation Policy (EO W-59-93), provides for "no overall net loss" of wetlands and achieving a "long-term net gain in the quantity, quality, and permanence of wetlands acreage and values in California." Therefore, a minimum 1:1 creation-restoration ratio would be applied toward any impacts to jurisdictional waters. Project-specific mitigation ratios would be developed in consultation with the CDFG.

As a requirement of the 1602 permit application, the development of a conceptual mitigation, maintenance, and monitoring plan would be required for the mitigation, which is a requirement of both the State 1602 permit applications. This plan should include details regarding site preparation (e.g., grading), planting specifications, and irrigation design, as well as maintenance and monitoring procedures. The plan should outline yearly success criteria and remedial measures should the mitigation effort fall short of the success criteria. Any riparian mitigation that cannot be achieved through onsite creation-restoration and enhancement should be performed off site, typically per agency guidance within the same hydrologic unit (watershed) where impacts occur. Alternatively, the mitigation obligations may also be satisfied by participating in a fee-based mitigation program through a wetland mitigation bank. The proposed mitigation is subject to the resource agencies' review and discretion; thus, the mitigation obligations for the impacts to jurisdictional wetland habitats may change from those recommended here.

CWC Section 13000 *et seq*. (Porter-Cologne) Waste Discharge Requirement (or Waiver)

RWQCB regulates the "discharge of waste" to waters of the State.[43] The definition of the waters of the State is broader than that for waters of the United States in that all waters are considered to be a water of the State regardless of circumstances or condition. The term "discharge of waste" is also broadly defined in Porter-Cologne, such that discharges of waste include fill, any material resulting from human activity, or any other "discharge" that may directly or indirectly impact waters of the State. As conditional to this permit, best management practices (BMPs) will be required to ensure compliance with State water quality standards. BMPs can also be specified by RWQCB, based on the report of waste discharge (ROWD) (filed with the appropriate RWQCB by the applicant), which is authorized to regulate discharges of waste and fill material to waters of the State (including "isolated" waters and wetlands), through the issuance of a WDR.[44] WDRs are commonly issued based on the threshold of allowable pollutants into waters of the State.

Under Porter-Cologne, all applicants proposing to discharge waste that could affect the quality of waters of the State, other than into a community sewer system, shall file with the appropriate RWQCB an ROWD containing such information and data as may be required by the RWQCB.[45] RWQCB will then respond to ROWD by issuing a WDR in a public hearing, or by waiving WDRs (with or without conditions) for that proposed discharge. RWQCB has a statutory obligation to prescribe WDRs, except where RWQCB finds that a waiver (with or without conditions) of WDRs for a specific type of discharge is in the public interest.[46] Therefore, all parties proposing to discharge waste that could affect waters of the State, but do not affect Federal waters (which requires authorization under CWA Section 404 and certification under CWA Section 401) must file an ROWD with the appropriate RWQCB prior to issuance of the WDR.[47]

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43 "Waters of the State" is defined in CWC Section 13050(e).
44 CWC Section 13263.
45 CWC Section 13260(a).
46 CWC Section 13269.
47 CWC Section 13260.

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ATTACHMENT 1

FIGURES

Map Location

1 inch = 40 miles

0 40 80 Miles

Blythe Solar Power Project
Revised Jurisdictional Waters Report

Figure 1
Regional Map

Source: ESRI; AECOM 2009

AECOM

Date: May 2010

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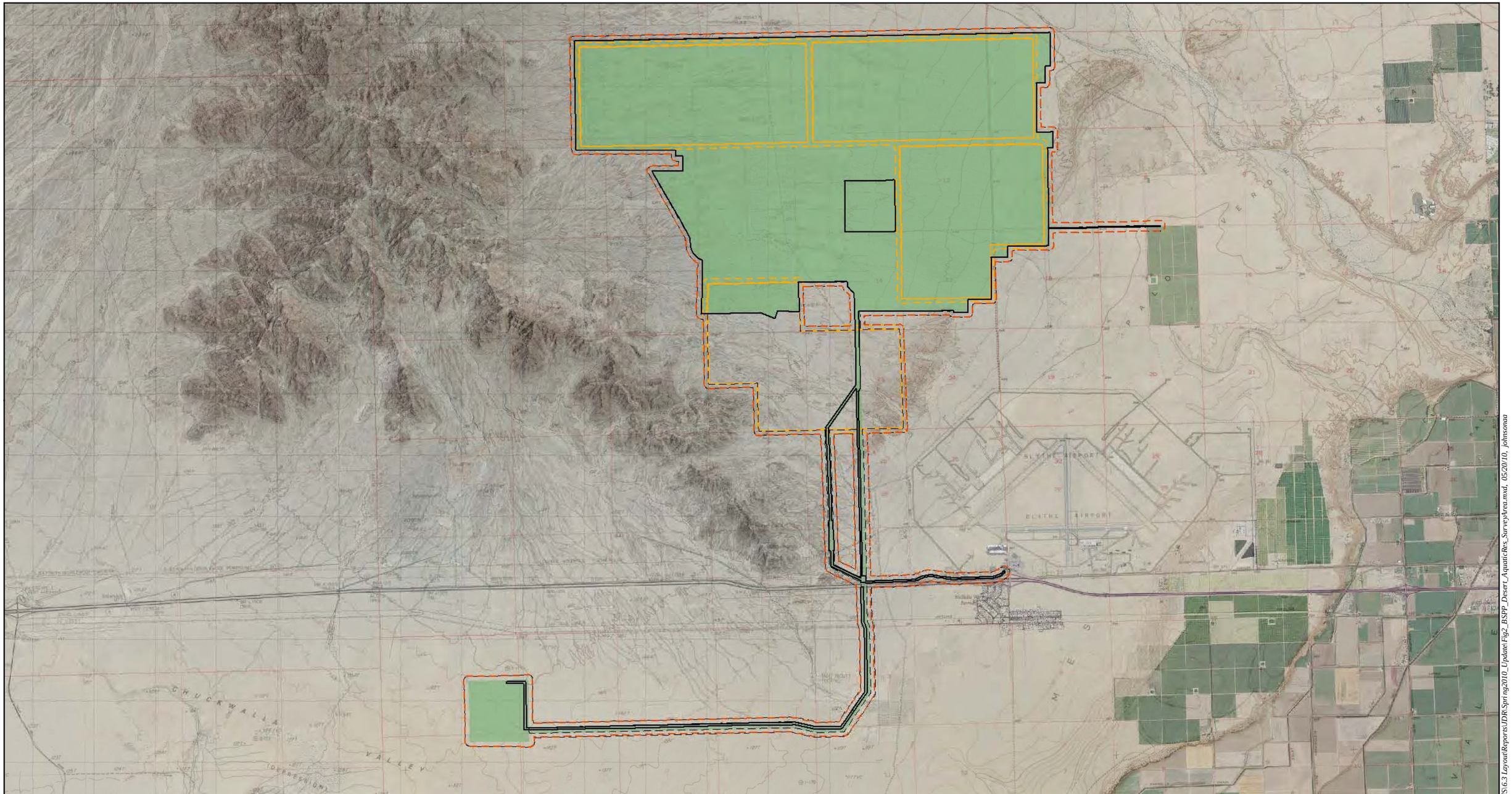

Map Location

Legend

- Desert Aquatic Resources Survey Area (DARSA)
- Proposed Project Study Area
- Proposed Project DARSA
- Project Disturbance Area
- Reconfigured Alternative DARSA
- Reconfigured Alternative Disturbance Area

Source: NAIP 2009; USGS; AECOM 2010

N W E S

1 inch = 5,000 feet

0 6,000 12,000 Feet

Blythe Solar Power Project
Revised Jurisdictional Waters Report

Figure 2
Desert Aquatic Resources Survey Area

AECOM

Date: May 2010

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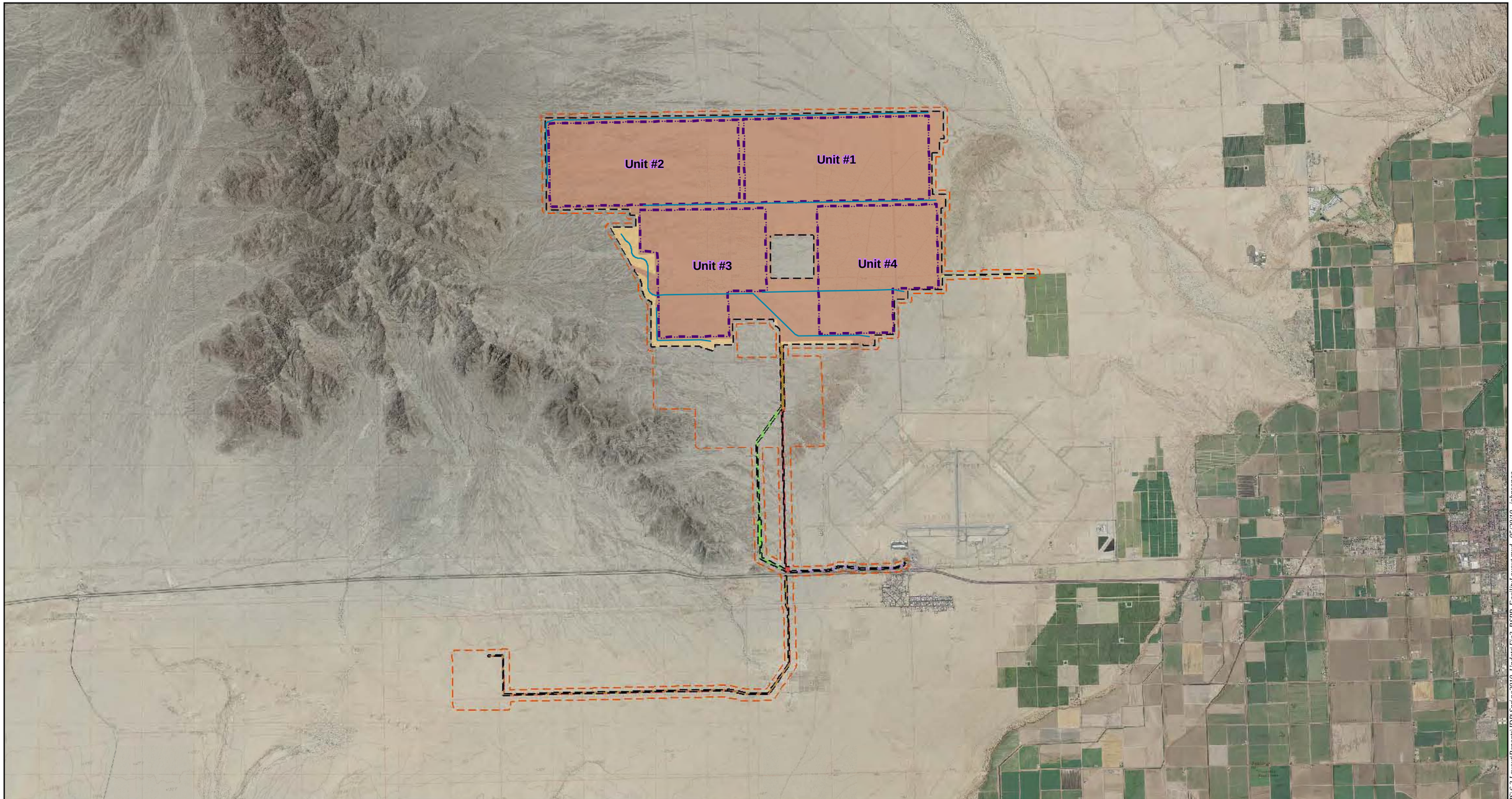

Map Location

Legend

- Desert Aquatic Resources Survey Area
- Project Disturbance Area
- Black Rock Rd Access (17.29 acres)
- Disturbance Area 2009 (7,024.51acres)
- Additional Disturbance Areas 2010 (420.88 acres)
- Gen-Tie Alignment Deviation (37.21 acres)
- Temporary Construction Power (4.10 acres)
- Utility Corridor (125.82 acres)
- Gen-Tie Alignment/Utility Corridor Overlap (99.94 acres)

Facilities Layout

- Solar Unit
- Rerouted Drainage

Source: NAIP 2009; ESR 2010I; AECOM 2010

N W E S

1 in = 6,000 feet

0 6,000 12,000 Feet

Blythe Solar Power Project
Revised Jurisdictional Waters Report

Figure 3
Project Facility Layout

AECOM

Date: May 2010

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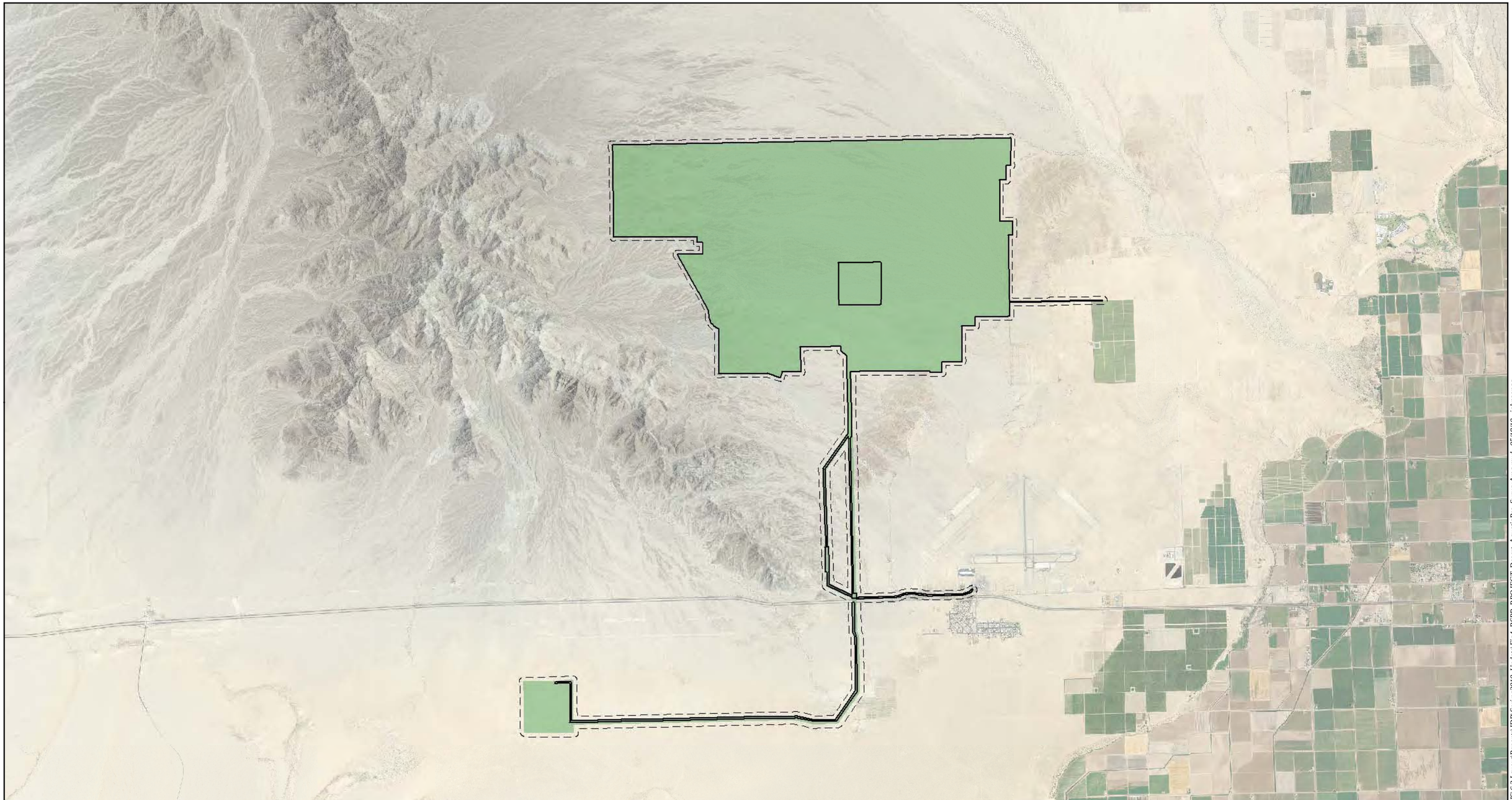

Map Location

Legend

- Proposed Project Study Area
- Project Disturbance Area
- Proposed Project DARSA

Source: NAIP 2009; AECOM 2010

N
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1 inch = 6,000 feet

0 6,000 12,000 Feet

Blythe Solar Power Project
Revised Jurisdictional Waters Report

Figure 4
Project Desert Aquatic Resources Survey Area

AECOM

Date: May 2010

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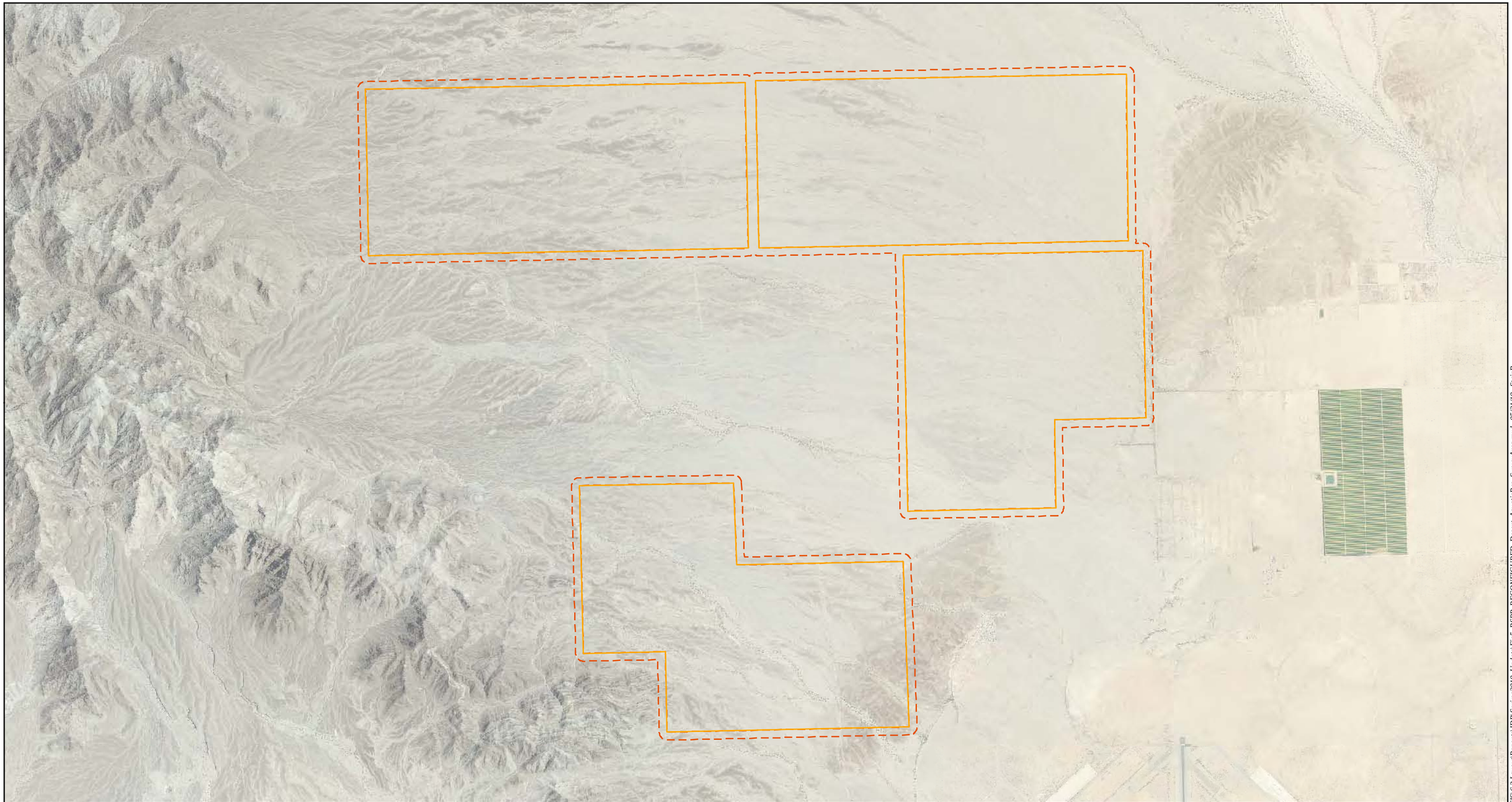

Map Location

Legend

- Reconfigured Alternative Disturbance Area
- Reconfigured Alternative Desert Aquatic Resources Survey Area

Source: NAIP 2009; AECOM 2010

N
W E
S

1 inch = 3,000 feet

0 3,000 6,000 Feet

Blythe Solar Power Project
Revised Jurisdictional Waters Report

Figure 5
Reconfigured Alternative Desert Aquatic Resources Survey Area

AECOM

Date: May 2010

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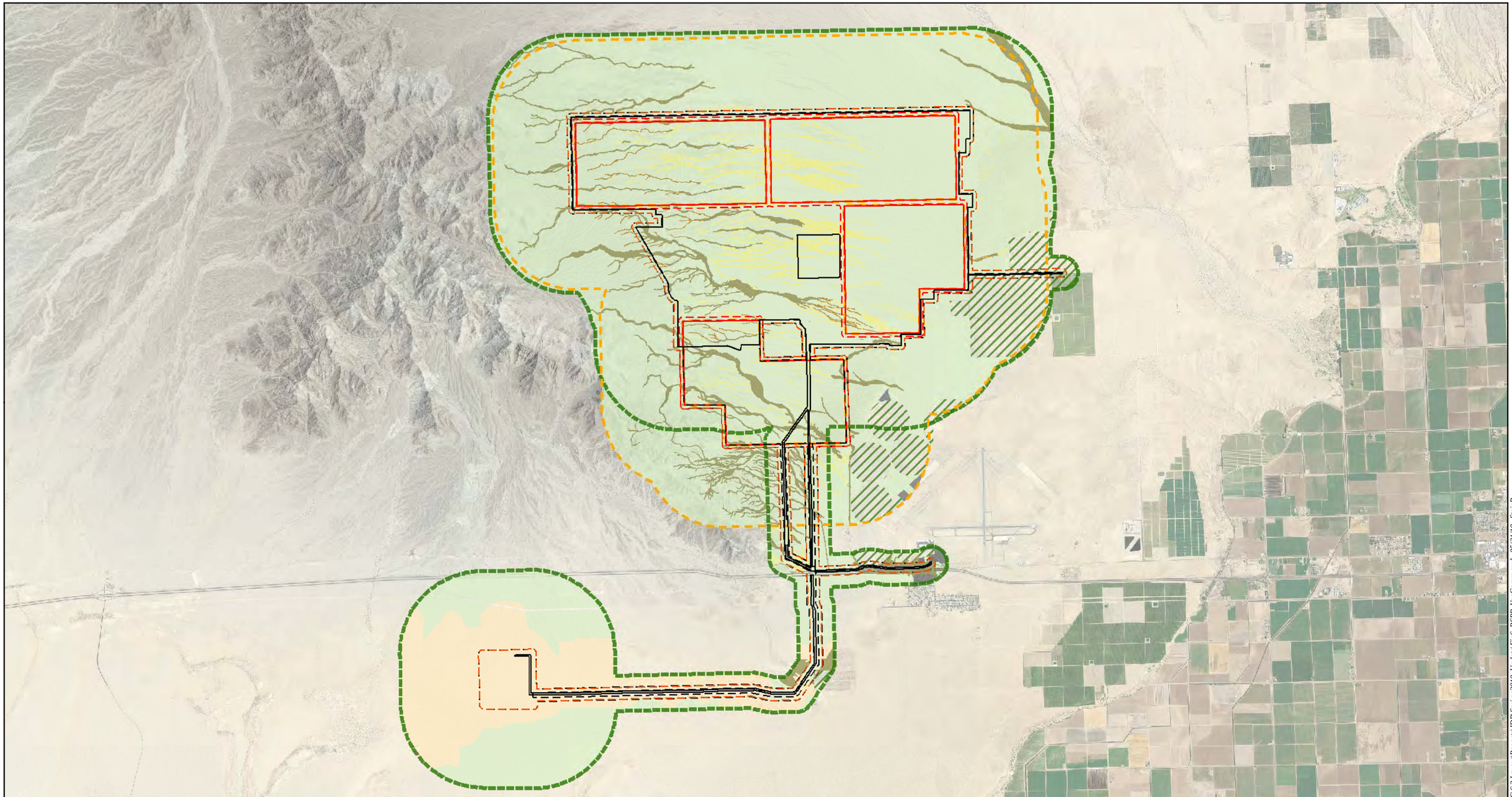

Map Location

Legend

- Desert Aquatic Resources Survey Area
- Project Disturbance Area
- Proposed Project Desert Aquatic Resources Survey Area
- Proposed Project BRSA
- Reconfigured Alternative Disturbance Area
- Reconfigured Alternative Desert Aquatic Resources Survey Area
- Reconfigured Alternative BRSA

Source: NAIP 2009; AECOM 2010

Vegetation Communities

Riparian

- Creosote Bush - Big Galleta Grass Association
- Desert Dry Wash Woodland
- Unvegetated Ephemeral Dry Wash

Upland

- Sonoran Creosote Bush Scrub
- Stabilized and Partially Stabilized Desert Dunes

Other

- Agriculture (Active and Fallow)
- Developed

N W E S

1 inch = 6,000 feet

0 6,000 12,000 Feet

Blythe Solar Power Project Revised Jurisdictional Waters Report

Figure 6 Vegetation Communities

AECOM

Date: May 2010

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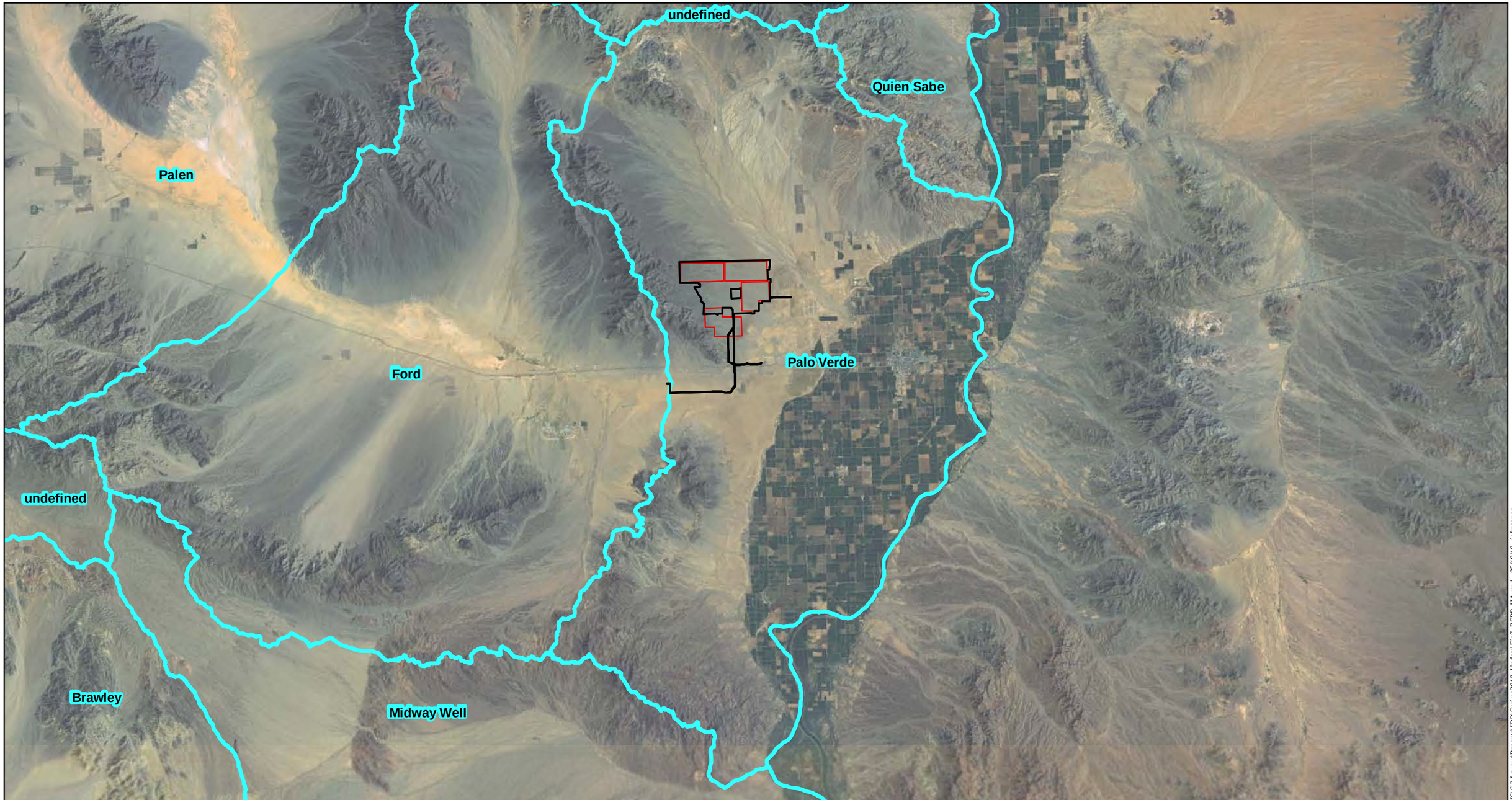

Map Location

Legend

- Project Disturbance Area
- Reconfigured Alternative Disturbance Area
- Hydrologic Areas

Source: ESRI; CDFG; AECOM 2010

N
W E
S

1 inch = 5 miles

0 5 10 Miles

Blythe Solar Power Project
Revised Jurisdictional
Waters Report

Figure 7
Hydrologic Areas

AECOM

Date: May 2010

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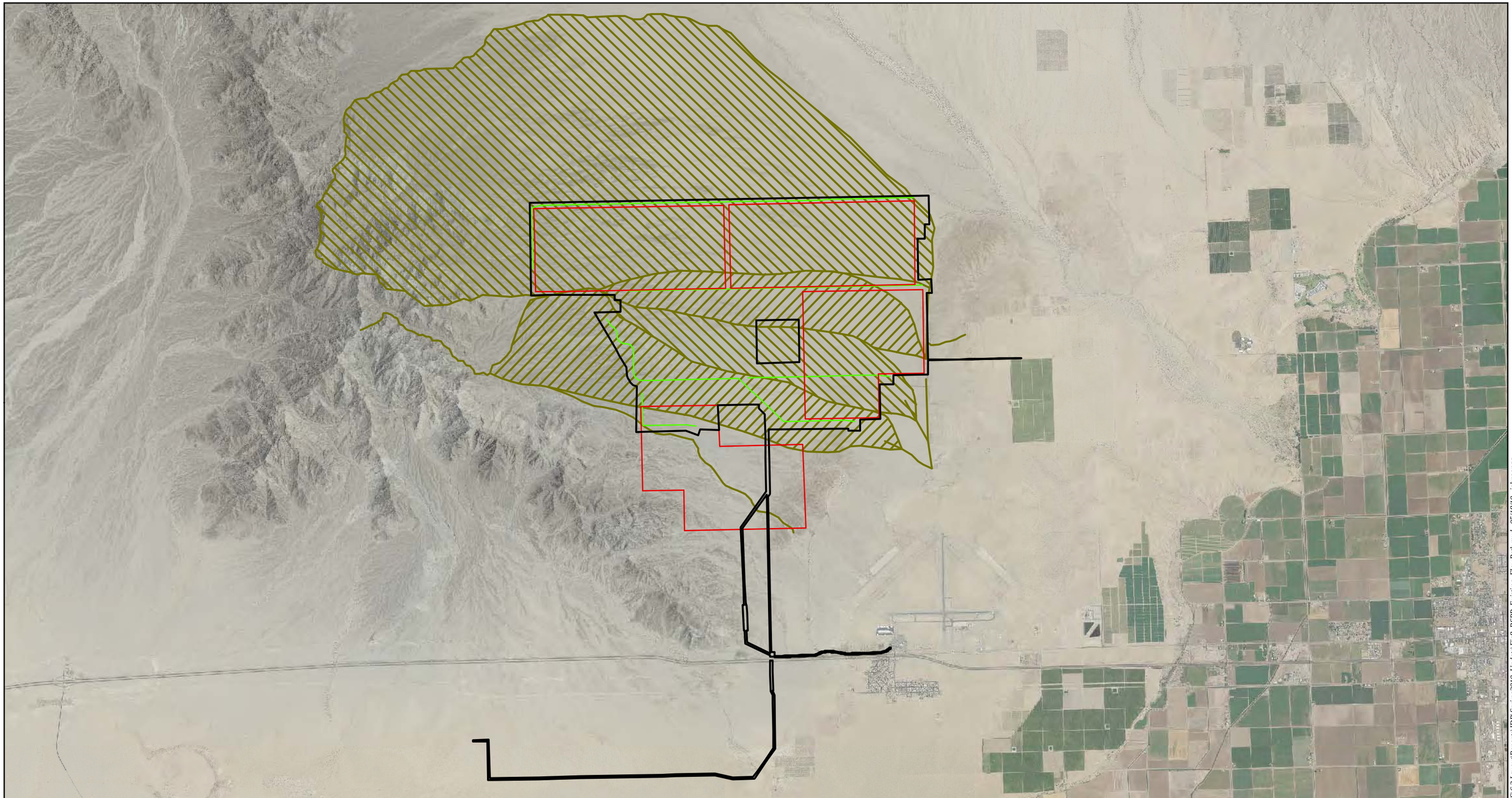

Map Location

Legend

- Project Disturbance Area
- Reconfigured Alternative Disturbance Area
- Existing Flow Paths
- Rerouted Drainages

Source: NAIP 2009; NECO; AECOM 2010

N
W E
S

1 inch = 6,000 feet

0 6,000 12,000 Feet

Blythe Solar Power Project
Revised Jurisdictional Waters Report

Figure 8
Existing Flow Paths

AECOM

Date: May 2010

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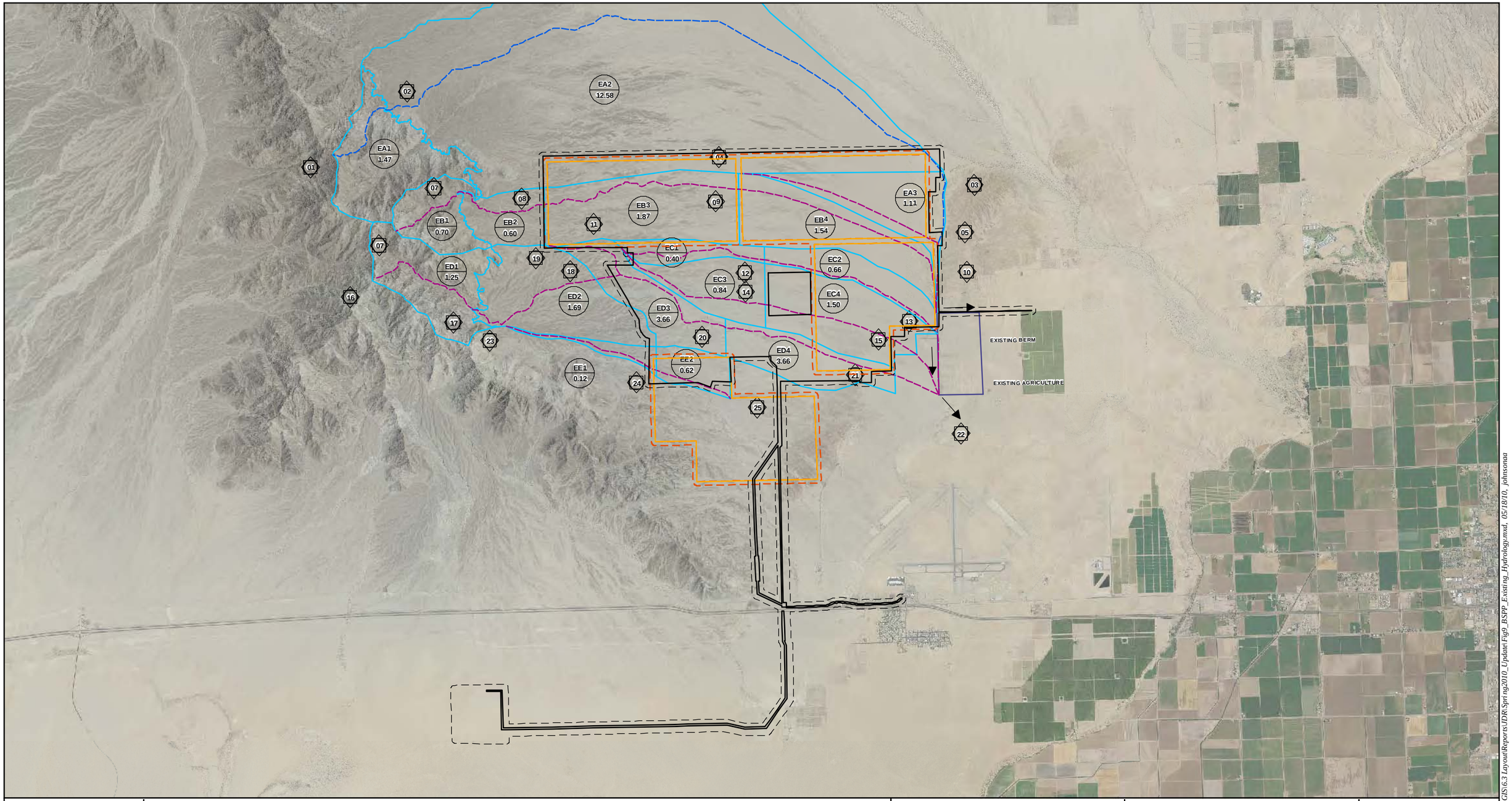

Map Location

Legend

- Project Disturbance Area
- Proposed Project DARSA
- Reconfigured Alternative Disturbance Area
- Reconfigured Alternative Desert Aquatic Resources Survey Area
- Agriculture
- Ex-Hydrology-Area
- Ex-Hydrology-Fl
- Drainage Area
- Hydrology-Area
- Hydrology-Fl

EA — DRAINAGE AREA NAME
15.35 — AREA (SQ. MILES)

NODE NUMBER 01 Q= 100 YEAR DISCHARGE
V= 100 YEAR VOLUME

Source: NAIP 2009; NECO; AECOM 2010

N W E S

1 inch = 6,000 feet

0 6,000 12,000 Feet

Blythe Solar Power Project
Revised Jurisdictional Waters Report

Figure 9
Existing Hydrology Map

AECOM

Date: May 2010

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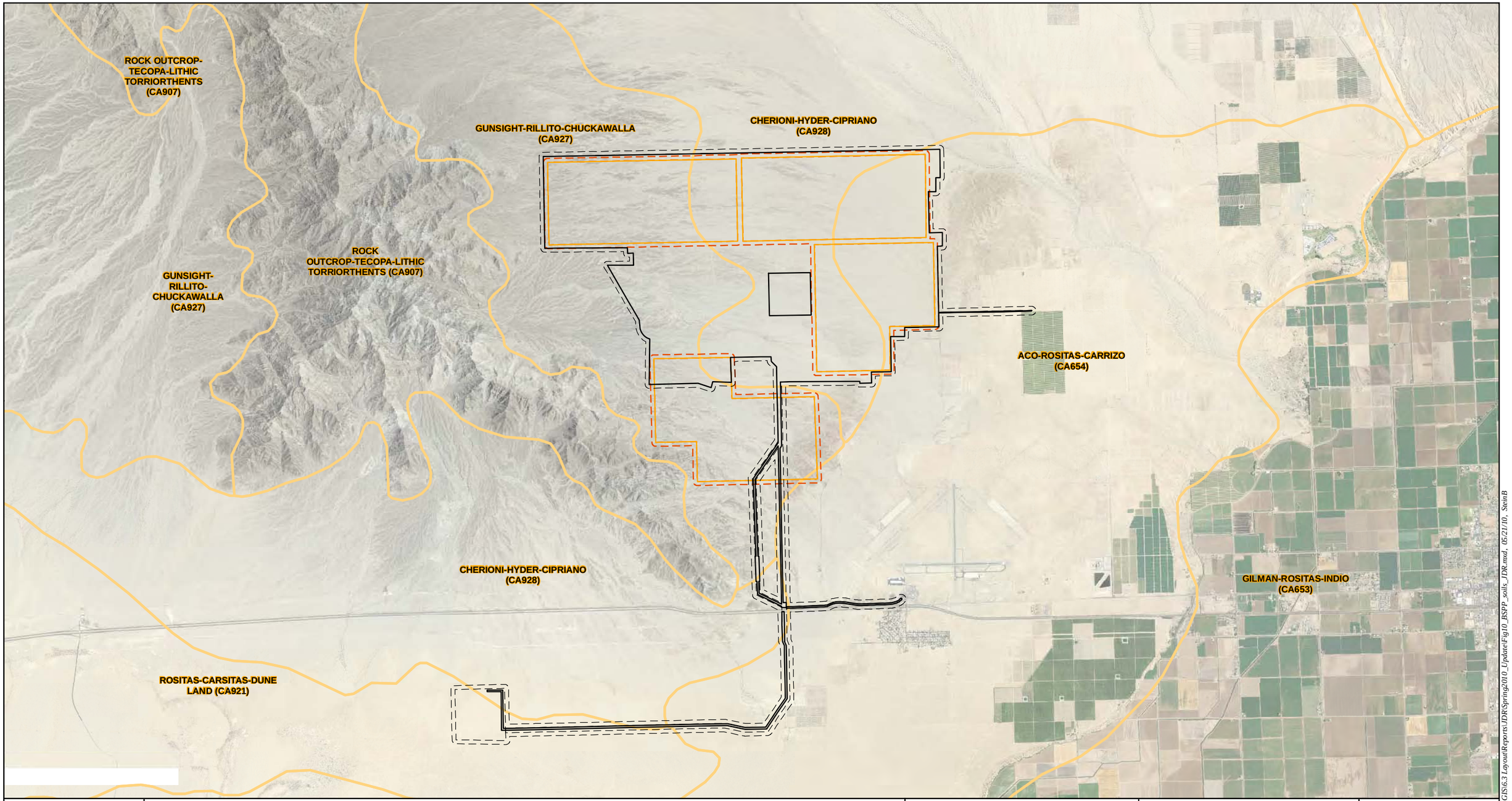

Map Location

Legend

- Project Disturbance Area
- Proposed Project Desert Aquatic Resources Survey Area
- Reconfigured Alternative Disturbance Area
- Reconfigured Alternative Desert Aquatic Resources Survey Area
- Soil Types

Source: NAIP 2009; AECOM 2009; SSURGO 2009

N W E S

1 inch = 6,000 feet

0 6,000 12,000 Feet

Blythe Solar Power Project
Revised Jurisdictional Waters Report

Figure 10
Soils

AECOM

Date: May 2010

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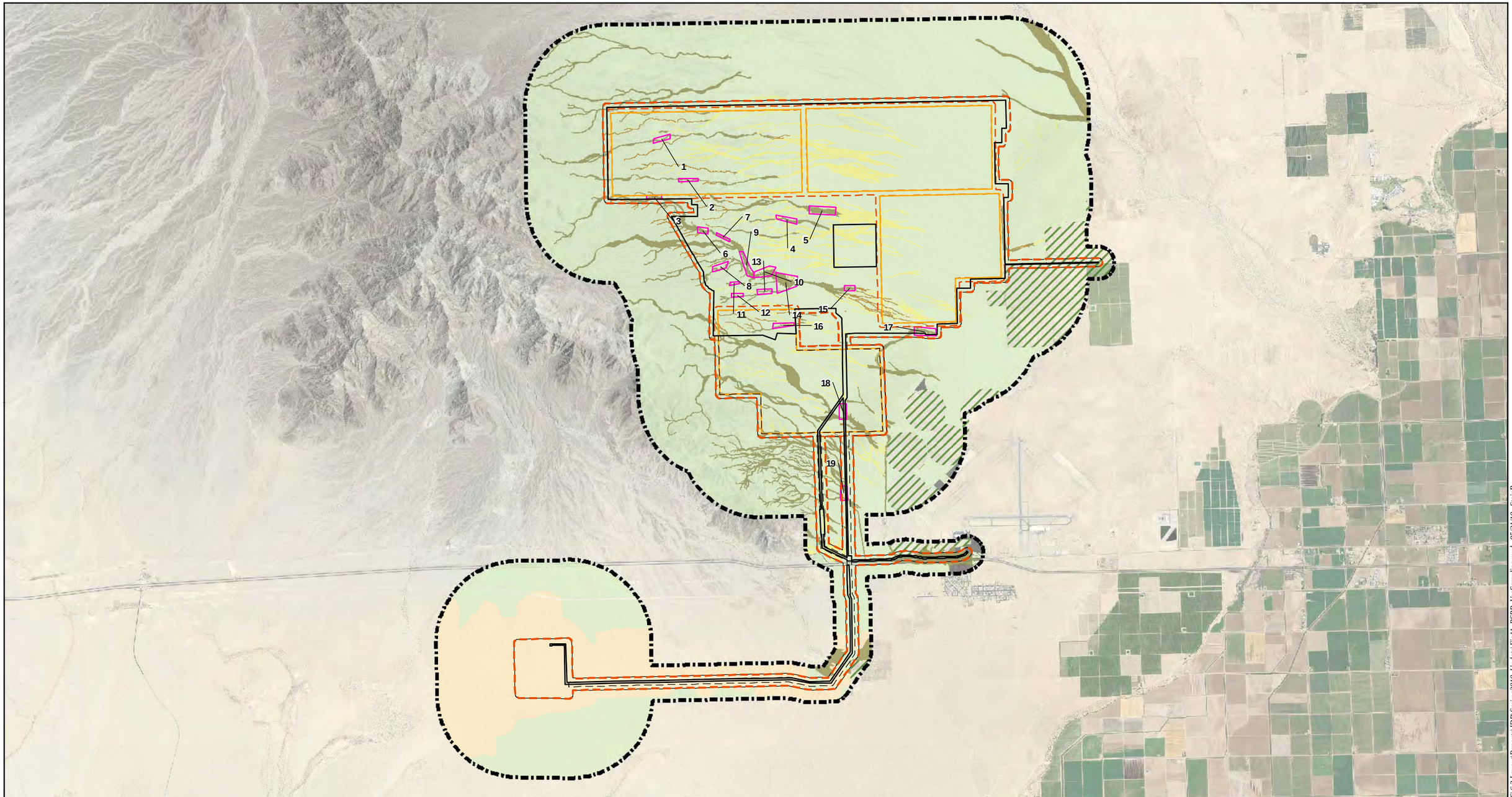


Map Location

Legend

- Desert Aquatic Resources Survey Area
- Project Disturbance Area
- Proposed Project Desert Aquatic Resources Survey Area
- Reconfigured Alternative Disturbance Area
- Reconfigured Alternative Desert Aquatic Resources Survey Area
- Biological Resources survey Area (BRSA)
- Vegetation Subsampling Areas

Source: NAIP 2009; AECOM 2010

N W E S

1 inch = 6,000 feet

0 6,000 12,000 Feet

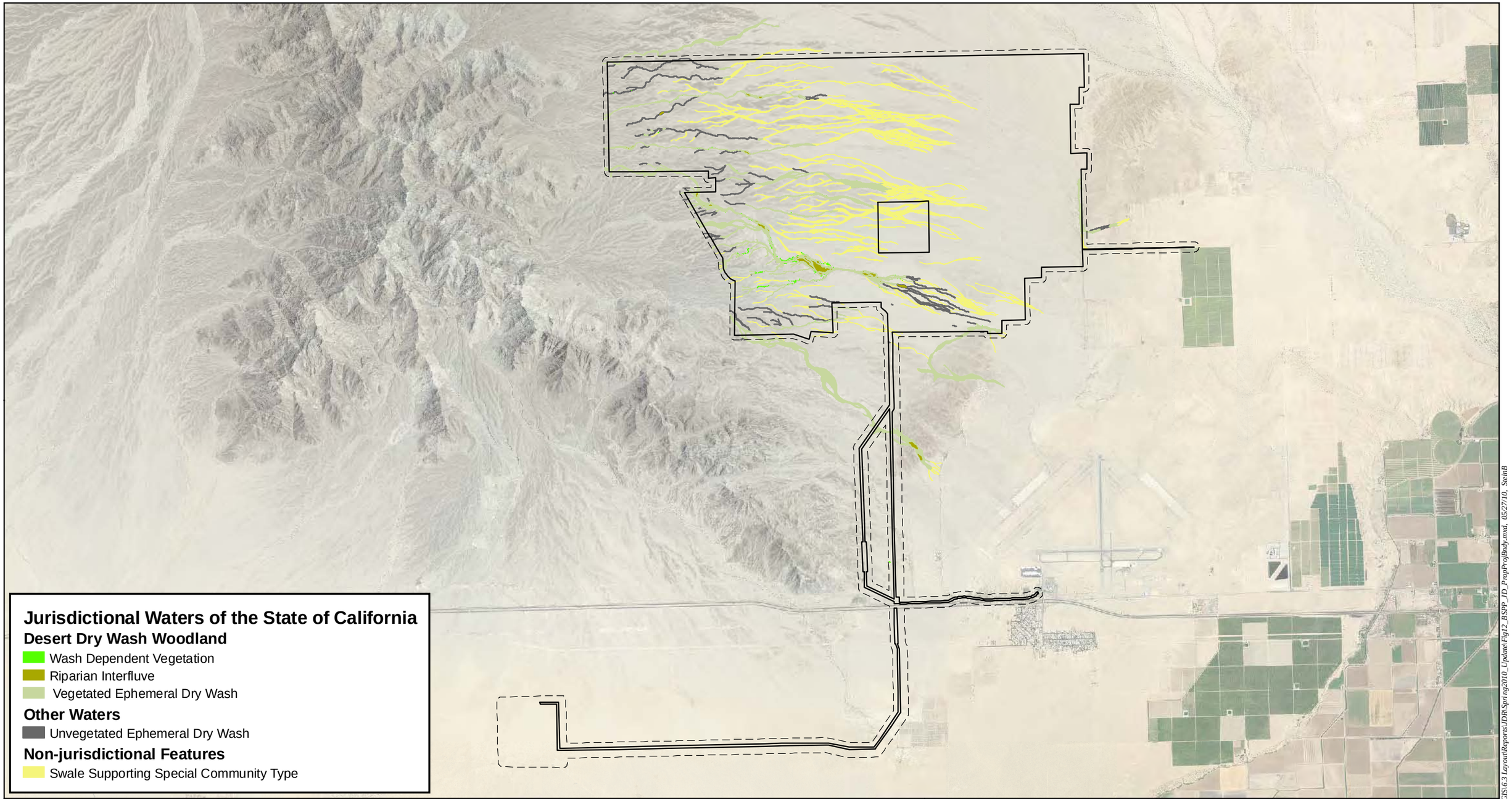
Blythe Solar Power Project
Revised Jurisdictional Waters Report

Figure 11
Wash-Dependent Vegetation Subsampling

AECOM

Date: May 2010

Path: P:\2009\09080082 Sol MII Blythe\6.0 GIS\6.3 Layout\Reports\JDR\Spring2010_Update\Fig11_BSPP_VegSampling.mxd, 05/21/10, SteinB



Map Location

Legend

- Proposed Project DARSA
- Project Disturbance Area

Source: NAIP 2009; AECOM 2010

N
W E
S

1 inch = 5,000 feet

0 5,000 10,000 Feet

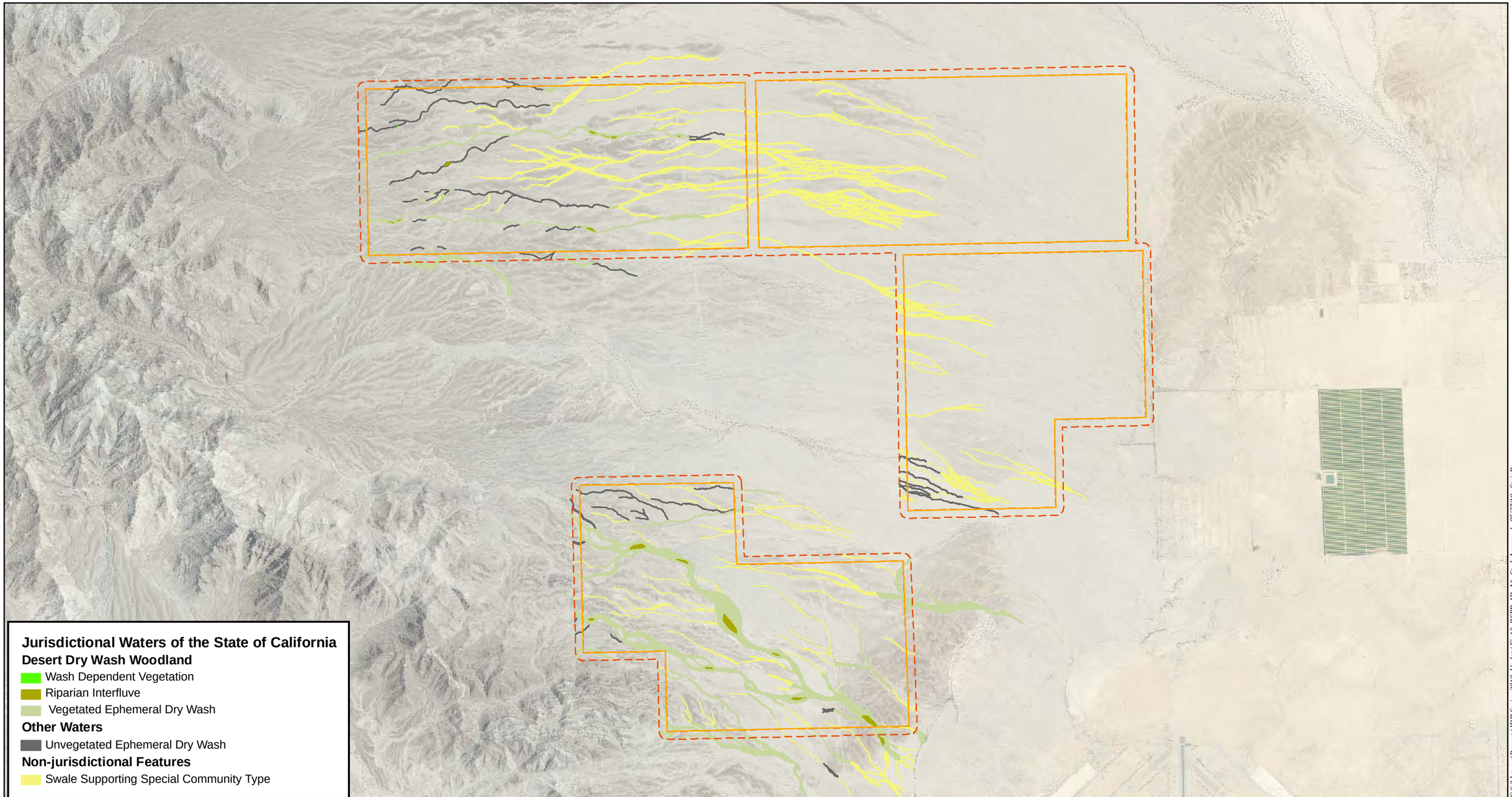
Blythe Solar Power Project
Revised Jurisdictional Waters Report

Figure 12
Jurisdictional Waters
Proposed Project DARSA

AECOM

Date: May 2010

Path: P:\2009\09080082 Sol Mil Blythe\6.0 GIS\6.3 Layout\Reports\JDR\Spring2010_Update\Fig12_BSPP_JD_PropProjBndy.mxd, 05/27/10, SteinB



Map Location

Legend

Reconfigured Alternative Disturbance Area

Reconfigured Alternative Desert Aquatic Resources Survey Area

Source: NAIP 2009; AECOM 2010

N
W E
S

1 inch = 3,000 feet

0 3,000 6,000 Feet

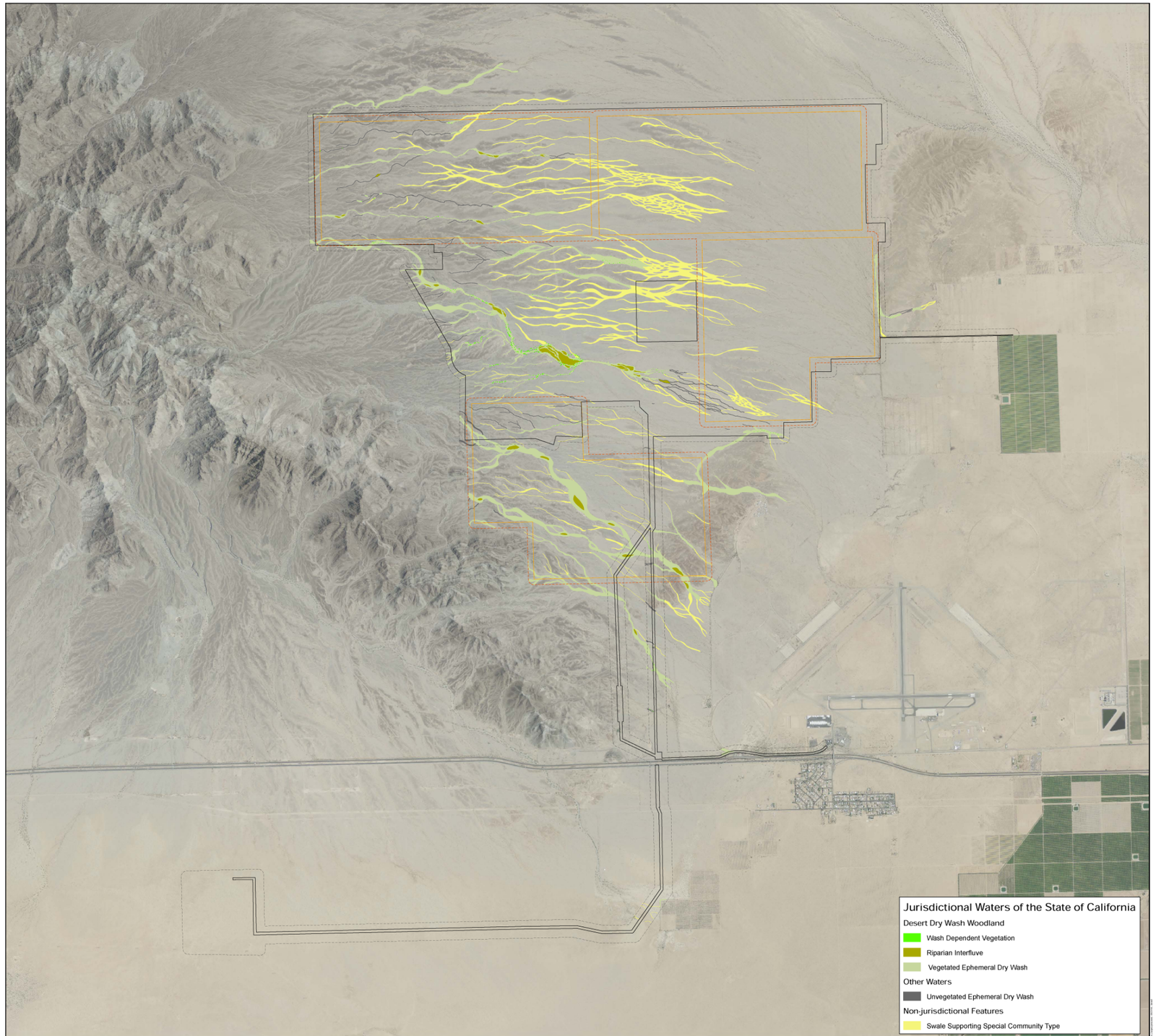
Blythe Solar Power Project
Revised Jurisdictional Waters Report

Figure 13
Jurisdictional Waters
Reconfigured Alternative
DARSA

AECOM

Date: May 2010

Path: P:\2009\09080082 Sol Mil Blythe\6.0 GIS\6.3 Layout\Reports\JDR\Spring2010_Update\Fig13_BSPP_JD_Alt_StudyArea.mxd, 05/27/10, SteinB



Map Location

Legend

- Project Disturbance Area
- Proposed Project Desert Aquatic Resources Survey Area
- Reconfigured Alternative Disturbance Area
- Reconfigured Alternative Desert Aquatic Resources Survey Area

Source: NAIP 2005; AECOM 2009

N W E S

1 inch = 1,250 feet

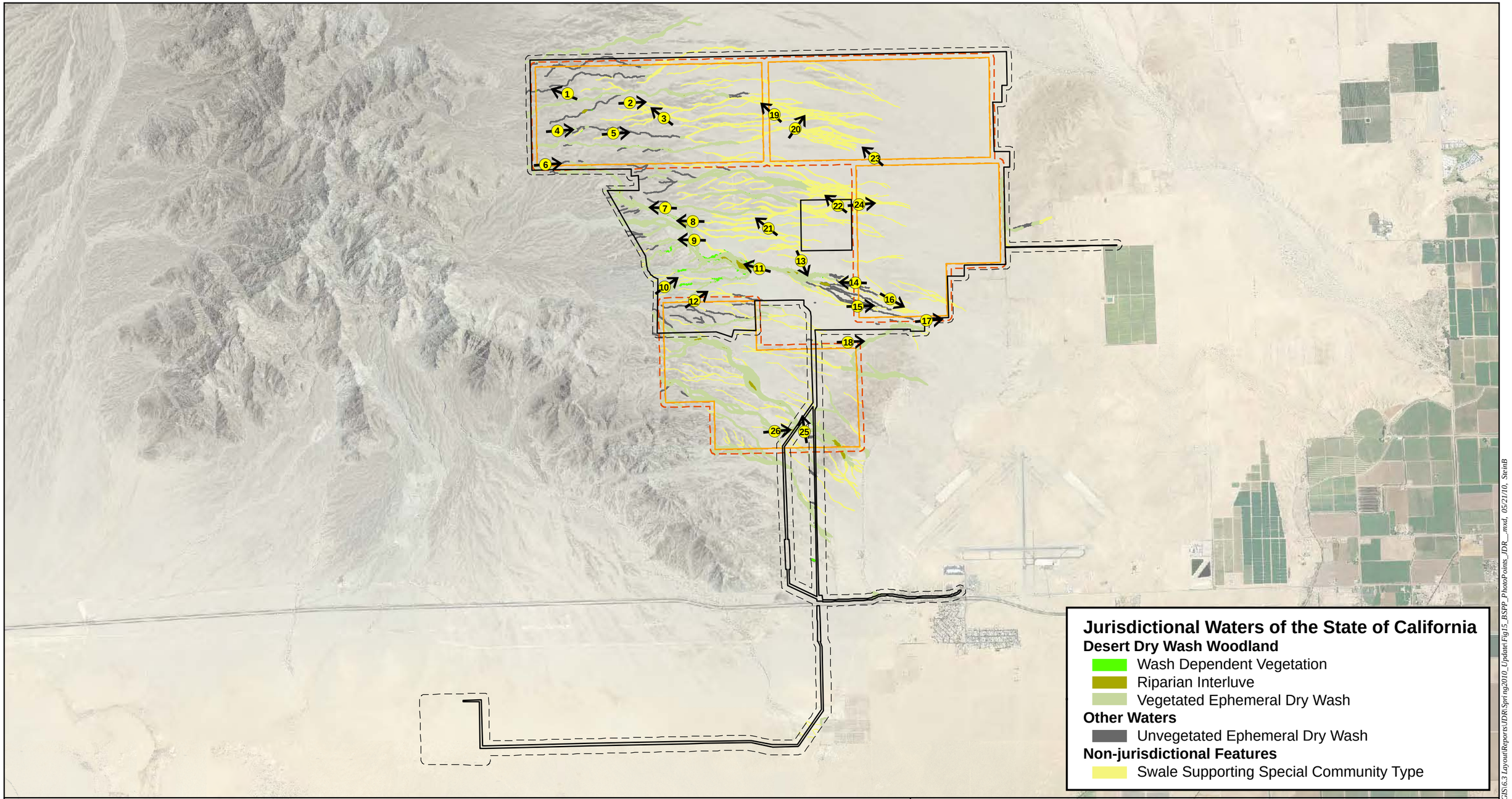
0 1,250 2,500 3,750 5,000 Feet

Blythe Solar Power Project
Revised Jurisdictional
Waters Report

Figure 14
Jurisdictional Waters of the State
Desert Aquatic Resources
Survey Area

AECOM

Date: May 2010



Map Location

Legend

- Proposed Project Desert Aquatic Resources Survey Area
- Project Disturbance Area
- Reconfigured Alternative Disturbance Area
- Reconfigured Alternative Desert Aquatic Resources Survey Area

Source: NAIP 2009; AECOM 2009

N W E S

1 inch = 5,000 feet

0 5,000 10,000 Feet

Blythe Solar Power Project
Revised Jurisdictional Waters Report

Figure 15a
Photo Point Locations

AECOM

Date: May 2010

Path: P:\2009\09080082 Sol Mil Blythe\6.0 GIS\6.3 Layout\Reports\JDR\Spring2010_Update\Fig15_BSPP_PhotoPoints_JDR__mxd, 05/21/10, SteinB

Photograph 1: Looking west (upstream) at a secondary unvegetated ephemeral dry wash. Note that the dominant vegetation along the banks consists of upland species and wash is unvegetated with small amounts of cobble.

Photograph 2: Looking east at a swale lacking a defined bed and bank and dominated by upland vegetation. These features are found throughout the disturbance area within shallow depression adjacent to the desert pavement.

Map Location

Blythe Solar Power Project Jurisdictional Delineation Report

Figure 15b Representative Photographs 1 and 2

Solar Millennium

AECOM

Date: August 2009

Photograph 3: Looking northwest across the desert pavement. Note the concentration of creosote bush scrub occupying depressions within the landscape. These features were predominantly classified as swales as they were lacking in a defined bad and bank and populated by upland vegetation.

Photograph 4: Looking east (downstream) at a 4-foot wide unvegetated ephemeral dry wash.

Map Location

Blythe Solar Power Project
Revised Jurisdictional Delineation Report

Figure 15c
Representative Photographs 3 and 4

Solar Millennium

AECOM

Date: November 2009

Photograph 5: Looking east at a ephemeral dry wash populated by wash dependent plant species (including catclaw and ironwood) growing within and adjacent to the channel, shrubs and iron wood.

Photograph 6: Looking east from the edge of the disturbance area across the primary wash. Note the sandy substrate with cobble and scarcity of vegetation within the wash.

Map Location

Blythe Solar Power Project
Revised Jurisdictional Delineation Report

Figure 15d
Representative Photographs 5 and 6

Solar Millennium

AECOM

Date: November 2009

Photograph 7: Looking west (upstream) at the primary wash. Note the presence of cobble in the channel and the dense wash dependent vegetation.

Photograph 8: Looking west (upstream) at the primary wash. The wash in this area is less confined than in other areas and as such the wash dependent vegetation is more prevalent outside of the primary channel. Note the sandy substrate (entisols) and the alluvial deposition composing the channel.

Map Location

Blythe Solar Power Project
Revised Jurisdictional Delineation Report

Figure 15e
Representative Photographs 7 and 8

Solar Millennium

AECOM

Date: November 2009

Photograph 9: Looking west (upstream) at the primary wash. Note the prevalence of wash dependent trees on and at the base of the bank, including ironwood and blue palo verde

Photograph 10: Looking northeast at a swale/erosive feature that drains to the primary wash. This was a common feature along the primary wash, often occurring in depressions in the desert pavement. Note the lack of a defined bed and bank and the presence of upland vegetation occupying this feature.

Map Location

Blythe Solar Power Project
Revised Jurisdictional Delineation Report

Figure 15f
Representative Photographs 9 and 10

Solar Millennium

AECOM

Date: November 2009

Photograph 11: Looking west (upstream) at the primary wash. East of this point the wash splits into two large channels that surround a large riparian interfluve. Note the southern bank along the right side of the photo and the dense wash dependent vegetation throughout the wash.

Photograph 12: Looking northeast at a small 3-5 foot wide secondary channel that feeds into the primary channel onsite. Note the defined bed and bank in the foreground and the density of big galleta grass within the channel.

Map Location

Blythe Solar Power Project
Revised Jurisdictional Delineation Report

Figure 15g
Representative Photographs 11 and 12

Solar Millennium

AECOM

Date: November 2009

Photograph 13: Looking southeast at the southern bank of the primary wash. Note the transition from wash dependent vegetation at the base of the slope to creosote bush at the top of the bank.

Photograph 14: Looking west at the southern channel of the primary drainage. Note the prevalence of wash dependent trees including ironwood and blue palo verde. Note the sandy soil characteristic on an entisol and alluvial deposition.

Map Location

Blythe Solar Power Project
Revised Jurisdictional Delineation Report

Figure 15h
Representative Photographs 13 and 14

Solar Millennium

AECOM

Date: November 2009

Photograph 15: Looking east where primary wash begins to abate into the upland.

Photograph 16: Looking east where small unvegetated ephemeral dry wash transitions to swale features. Note the lack of a defined bad and bank.

Map Location

Blythe Solar Power Project
Revised Jurisdictional Delineation Report

Figure 15i
Representative Photographs 15 and 16

Solar Millennium

AECOM

Date: November 2009

Photograph 17: Looking east at the terminus of a secondary wash where the bed and bank fades out and water becomes sheet flow across the uplands.

Photograph 18: looking east at a vegetated ephemeral dry wash. Note the prevalence of wash dependent species including big galleta grass and ironwood.

Map Location

Blythe Solar Power Project
Revised Jurisdictional Delineation Report

Figure 15j
Representative Photographs 17 and 18

Solar Millennium

AECOM

Date: November 2009

Photograph 19: Looking northwest at vegetated swales (creosote-big galleta grass) and desert pavement.

Photograph 20: Looking northeast at vegetated swales (creosote-big galleta grass).

Map Location

Blythe Solar Power Project
Revised Jurisdictional Delineation Report

Figure 15k
Representative Photographs 19 and 20

Solar Millennium

AECOM

Date: November 2009

Photograph 21: Looking northwest. Vegetated swale. Note well developed big galleta grass and subtle fluvial features

Photograph 22: Looking northwest at vegetated swale (creosote-big galleta grass). Note subtle fluvial features.

Map Location

Blythe Solar Power Project
Revised Jurisdictional Delineation Report

Figure 15l
Representative Photographs 21 and 22

Solar Millennium

AECOM

Date: November 2009

Photograph 23: Looking northwest at vegetated swales (creosote-big galleta grass).

Photograph 24: Lookiing northeast at cessation of swale and big galleta grass. Note how swale abates into the landsccape.

Map Location

Blythe Solar Power Project
Revised Jurisdictional Delineation Report

Figure 15m
Representative Photographs 23 and 24

Solar Millennium

AECOM

Date: November 2009

Photograph 25: Looking north (upstream) at a secondary channel that forms as a result of onsite swale features terminating and coalescing along a segment of desert pavement before dissipating again into the upland. Note the desert pavement berm along the right side of the photo and the dense coverage of wash dependent vegetation.

Photograph 26: Looking east at a large secondary wash that bisects the utility corridor. Much of this feature is bound by desert pavement to the north and south. Note the dense coverage of wash dependent species along the outer boundary of the channel. Note the sandy soil characteristic on an entisol and alluvial deposition.

Map Location

Blythe Solar Power Project
Revised Jurisdictional Delineation Report

Figure 15n
Representative Photographs 25 and 26

Solar Millennium

AECOM

Date: November 2009

ATTACHMENT 2

APPROVED JD FORM

APPROVED JURISDICTIONAL DETERMINATION FORM
UNITED STATES Army Corps of Engineers

This form should be completed by following the instructions provided in Section IV of the JD Form Instructional Guidebook.

SECTION I: BACKGROUND INFORMATION

A. REPORT COMPLETION DATE FOR APPROVED JURISDICTIONAL DETERMINATION (JD):

B. DISTRICT OFFICE, FILE NAME, AND NUMBER: Los Angeles District, South Coast Branch, Blythe Solar Power Plant

C. PROJECT LOCATION AND BACKGROUND INFORMATION:

State: CA County/parish/borough: Riverside City: Approximately 8.5 miles northwest of Blythe, CA (refer to Figures 1-4 in the Jurisdictional Delineation Report [JDR]).

Center coordinates of site (lat/long in degree decimal format): Lat. 33.672328° **N**, Long. -114.727844° **W**
Universal Transverse Mercator: 11 N 711399.24 mE 3728992.41 mN

Name of nearest waterbody: Colorado River (approximately 15 miles east of project location) and the Salton Sea (approximately 60 miles southwest of project location).

Name of nearest Traditional Navigable Water (TNW) into which the aquatic resource flows: N/A

Name of watershed or Hydrologic Unit Code (HUC): Imperial Reservoir (HUC 15030104)

☒ Check if map/diagram of review area and/or potential jurisdictional areas is/are available upon request (refer to Figures 3 through 15p in the JDR).

☐ Check if other sites (e.g., offsite mitigation sites, disposal sites, etc.) are associated with this action and are recorded on a different JD form.

D. REVIEW PERFORMED FOR SITE EVALUATION (CHECK ALL THAT APPLY):

☐ Office (Desk) Determination. Date:

☐ Field Determination. Date(s):

SECTION II: SUMMARY OF FINDINGS

A. RHA SECTION 10 DETERMINATION OF JURISDICTION.

There **are no** "*navigable waters of the UNITED STATES*" within Rivers and Harbors Act (RHA) jurisdiction (as defined by 33 CFR part 329) in the review area. [*Required*]

☐ Waters subject to the ebb and flow of the tide.

☐ Waters are presently used, or have been used in the past, or may be susceptible for use to transport interstate or foreign commerce. Explain:

B. CWA SECTION 404 DETERMINATION OF JURISDICTION.

There **are no** "*waters of the UNITED STATES*" within Clean Water Act (CWA) jurisdiction (as defined by 33 CFR part 328) in the review area. [*Required*]

1. Waters of the UNITED STATES

a. Indicate presence of waters of UNITED STATES in review area (check all that apply):[1]

☐ TNWs, including territorial seas
☐ Wetlands adjacent to TNWs
☐ Relatively permanent waters[2] (RPWs) that flow directly or indirectly into TNWs
☐ Non-RPWs that flow directly or indirectly into TNWs
☐ Wetlands directly abutting RPWs that flow directly or indirectly into TNWs
☐ Wetlands adjacent to but not directly abutting RPWs that flow directly or indirectly into TNWs
☐ Wetlands adjacent to non-RPWs that flow directly or indirectly into TNWs
☐ Impoundments of jurisdictional waters
☐ Isolated (interstate or intrastate) waters, including isolated wetlands

b. Identify (estimate) size of waters of the UNITED STATES in the review area:

Non-wetland waters: linear feet: width (ft) and/or acres.
Wetlands: acres.

---

[1] Boxes checked below shall be supported by completing the appropriate sections in Section III below.

[2] For purposes of this form, an RPW is defined as a tributary that is not a TNW and that typically flows year-round or has continuous flow at least "seasonally" (e.g., typically 3 months).

c. Limits (boundaries) of jurisdiction based on: **Not Applicable**
Elevation of established OHWM (if known):

2. Non-regulated waters/wetlands (check if applicable):[3]
☒ Potentially jurisdictional waters and/or wetlands were assessed within the review area and determined to be not jurisdictional. Explain:

1. All ephemeral washes delineated within the disturbance area abate into the landscape and become a discontinuous ephemeral wash.
2. No ephemeral wash delineated within the disturbance area directly connected with the McCoy Wash, which is itself a large ephemeral wash that presents an indirect hydrological connection with the Colorado River.
3. The lack of hydrological connectivity of the ephemeral washes into storm drains, culverts, or ditches (no storm drains are present within the disturbance area).
4. The lack of hydrological connectivity (presenting a significant nexus [SNX] to any traditional navigable waterbody [TNW]) for washes occurring within the disturbance area.
5. The evaluation of the ephemeral washes not presenting a SNX to a TNW include the volume, duration, and frequency of the flow of water to a TNW (the Salton Sea, 60 miles southwest and the Colorado River, 15 miles east of the disturbance area).
6. Examination of the flow characteristics and functions of ephemeral washes (which do not support adjacent wetlands) has been determined not to present a significant effect on the chemical, physical, and biological integrity of downstream TNWs.
7. Lack of an ecological connection to TNWs. The ephemeral washes present a low to no potential or capacity to transfer nutrients and organic carbon (vital to support downstream foodwebs [e.g., macroinvertebrates] present in headwater streams or to convert carbon in leaf litter making it available to species downstream), nor present habitat services such as providing spawning areas for recreationally or commercially important species in downstream waters.

SECTION III: CWA ANALYSIS

A. TNWs AND WETLANDS ADJACENT TO TNWs

The agencies will assert jurisdiction over TNWs and wetlands adjacent to TNWs. If the aquatic resource is a TNW, complete Section III.A.1 and Section III.D.1. only; if the aquatic resource is a wetland adjacent to a TNW, complete Sections III.A.1 and 2 and Section III.D.1.; otherwise, see Section III.B below.

1. TNW
Identify TNW: .

Summarize rationale supporting determination: .

2. Wetland adjacent to TNW
Summarize rationale supporting conclusion that wetland is "adjacent": .

B. CHARACTERISTICS OF TRIBUTARY (THAT IS NOT A TNW) AND ITS ADJACENT WETLANDS (IF ANY):

This section summarizes information regarding characteristics of the tributary and its adjacent wetlands, if any, and it helps determine whether or not the standards for jurisdiction established under *Rapanos* have been met.

The agencies will assert jurisdiction over non-navigable tributaries of TNWs where the tributaries are "relatively permanent waters" (RPWs), i.e. tributaries that typically flow year-round or have continuous flow at least seasonally (e.g., typically 3 months). A wetland that directly abuts an RPW is also jurisdictional. If the aquatic resource is not a TNW, but has year-round (perennial) flow, skip to Section III.D.2. If the aquatic resource is a wetland directly abutting a tributary with perennial flow, skip to Section III.D.4.

---

[3] Supporting documentation is presented in Section III.F.

A wetland that is adjacent to but that does not directly abut an RPW requires a significant nexus evaluation. Corps districts and EPA regions will include in the record any available information that documents the existence of a significant nexus between a relatively permanent tributary that is not perennial (and its adjacent wetlands if any) and a traditional navigable water, even though a significant nexus finding is not required as a matter of law.

If the waterbody[4] is not an RPW, or a wetland directly abutting an RPW, a JD will require additional data to determine if the waterbody has a significant nexus with a TNW. If the tributary has adjacent wetlands, the significant nexus evaluation must consider the tributary in combination with all of its adjacent wetlands. This significant nexus evaluation that combines, for analytical purposes, the tributary and all of its adjacent wetlands is used whether the review area identified in the JD request is the tributary, or its adjacent wetlands, or both. If the JD covers a tributary with adjacent wetlands, complete Section III.B.1 for the tributary, Section III.B.2 for any onsite wetlands, and Section III.B.3 for all wetlands adjacent to that tributary, both onsite and offsite. The determination whether a significant nexus exists is determined in Section III.C below.

1. Characteristics of non-TNWs that flow directly or indirectly into TNW

(i) General Area Conditions:
Watershed size: **acres**
Drainage area: **acres**
Average annual rainfall: inches
Average annual snowfall: inches

(ii) Physical Characteristics:
(a) Relationship with TNW:
☐ Tributary flows directly into TNW.
☐ Tributary flows through **Pick List** tributaries before entering TNW.

Project waters are **Pick List** river miles from TNW.
Project waters are **Pick List** river miles from RPW.
Project waters are **Pick List** aerial (straight) miles from TNW.
Project waters are **Pick List** aerial (straight) miles from RPW.
Project waters cross or serve as state boundaries. Explain:

Identify flow route to TNW[5]: .
Tributary stream order, if known: .

(b) General Tributary Characteristics (check all that apply):
Tributary is: ☐ Natural
☐ Artificial (man-made). Explain: .
☐ Manipulated (man-altered). Explain: .

Tributary properties with respect to top of bank (estimate):
Average width: feet
Average depth: feet
Average side slopes: **Pick List**

Primary tributary substrate composition (check all that apply):
☐ Silts ☐ Sands ☐ Concrete
☐ Cobbles ☐ Gravel ☐ Muck
☐ Bedrock ☐ Vegetation. Type/% cover:
☐ Other. Explain: .

Tributary condition/stability [e.g., highly eroding, sloughing banks]. Explain: .
Presence of run/riffle/pool complexes. Explain: .
Tributary geometry: **Pick List**
Tributary gradient (approximate average slope): %

---

4 Note that the Instructional Guidebook contains additional information regarding swales, ditches, washes, and erosional features generally and in the arid West.

5 Flow route can be described by identifying, e.g., tributary a, which flows through the review area, to flow into tributary b, which then flows into TNW.

(c) Flow:
Tributary provides for: **Pick List**
Estimate average number of flow events in review area/year: **Pick List**
Describe flow regime: .
Other information on duration and volume: .

Surface flow is: **Pick List**. Characteristics: .

Subsurface flow: **Pick List**. Explain findings: .
☐ Dye (or other) test performed: .

Tributary has (check all that apply):
☐ Bed and banks
☐ OHWM[6] (check all indicators that apply):
☐ clear, natural line impressed on the bank
☐ changes in the character of soil
☐ shelving
☐ vegetation matted down, bent, or absent
☐ leaf litter disturbed or washed away
☐ sediment deposition
☐ water staining
☐ other (list): .
☐ the presence of litter and debris
☐ destruction of terrestrial vegetation
☐ the presence of wrack line
☐ sediment sorting
☐ scour
☐ multiple observed or predicted flow events
☐ abrupt change in plant community
☐ Discontinuous OHWM.[7] Explain: .

If factors other than the OHWM were used to determine lateral extent of CWA jurisdiction (check all that apply):
☐ High Tide Line indicated by:
☐ oil or scum line along shore objects
☐ fine shell or debris deposits (foreshore)
☐ physical markings/characteristics
☐ tidal gauges
☐ other (list): .
☐ Mean High Water Mark indicated by:
☐ survey to available datum;
☐ physical markings;
☐ vegetation lines/changes in vegetation types.

(iii) Chemical Characteristics:
Characterize tributary (e.g., water color is clear, discolored, oily film; water quality; general watershed characteristics, etc.).
Explain: .
Identify specific pollutants, if known: .

(iv) Biological Characteristics. Channel supports (check all that apply):
☐ Riparian corridor. Characteristics (type, average width): .
☐ Wetland fringe. Characteristics: .
☐ Habitat for:
☐ Federally Listed species. Explain findings: .
☐ Fish/spawn areas. Explain findings: .
☐ Other environmentally-sensitive species. Explain findings: .
☐ Aquatic/wildlife diversity. Explain findings: .

2. Characteristics of wetlands adjacent to non-TNW that flow directly or indirectly into TNW

(i) Physical Characteristics:
(a) General Wetland Characteristics:
Properties:
Wetland size: acres
Wetland type. Explain: .

---

[6] A natural or man-made discontinuity in the OHWM does not necessarily sever jurisdiction (e.g., where the stream temporarily flows underground, or where the OHWM has been removed by development or agricultural practices). Where there is a break in the OHWM that is unrelated to the waterbody's flow regime (e.g., flow over a rock outcrop or through a culvert), the agencies will look for indicators of flow above and below the break.

[7] Ibid.

Wetland quality. Explain: .
Project wetlands cross or serve as state boundaries. Explain: .

(b) General Flow Relationship with Non-TNW:
Flow is: **Pick List**. Explain: .

Surface flow is: **Pick List**. Characteristics: .

Subsurface flow: **Pick List**. Explain findings: .
☐ Dye (or other) test performed: .

(c) Wetland Adjacency Determination with Non-TNW:
☐ Directly abutting
☐ Not directly abutting
☐ Discrete wetland hydrologic connection. Explain: .
☐ Ecological connection. Explain: .
☐ Separated by berm/barrier. Explain: .

(d) Proximity (Relationship) to TNW
Project wetlands are **Pick List** river miles from TNW.
Project waters are **Pick List** aerial (straight) miles from TNW.
Flow is from: **Pick List**.
Estimate approximate location of wetland as within the **Pick List** floodplain.

(ii) Chemical Characteristics:
Characterize wetland system (e.g., water color is clear, brown, oil film on surface; water quality; general watershed characteristics; etc.). Explain: .
Identify specific pollutants, if known: .

(iii) Biological Characteristics. Wetland supports (check all that apply):
☐ Riparian buffer. Characteristics (type, average width): .
☐ Vegetation type/percent cover. Explain: .
☐ Habitat for:
☐ Federally Listed species. Explain findings: .
☐ Fish/spawn areas. Explain findings: .
☐ Other environmentally-sensitive species. Explain findings: .
☐ Aquatic/wildlife diversity. Explain findings: .

3. Characteristics of all wetlands adjacent to the tributary (if any)
All wetland(s) being considered in the cumulative analysis: **Pick List**
Approximately acres in total are being considered in the cumulative analysis.

For each wetland, specify the following:

Directly abuts? (Y/N)	Size (in acres)	Directly abuts? (Y/N)	Size (in acres)

Summarize overall biological, chemical and physical functions being performed: .

C. SIGNIFICANT NEXUS DETERMINATION

A significant nexus analysis will assess the flow characteristics and functions of the tributary itself and the functions performed by any wetlands adjacent to the tributary to determine if they significantly affect the chemical, physical, and biological integrity of a TNW. For each of the following situations, a significant nexus exists if the tributary, in combination with all of its adjacent wetlands, has more than a speculative or insubstantial effect on the chemical, physical and/or biological integrity of a TNW. Considerations when evaluating significant nexus include, but are not limited to the volume, duration, and frequency of the flow of water in the tributary and its proximity to a TNW, and the functions performed by the tributary and all its adjacent wetlands. It is not appropriate to determine significant nexus based solely on any specific threshold of distance (e.g. between a tributary and

its adjacent wetland or between a tributary and the TNW). Similarly, the fact an adjacent wetland lies within or outside of a floodplain is not solely determinative of significant nexus.

Draw connections between the features documented and the effects on the TNW, as identified in the *Rapanos* Guidance and discussed in the Instructional Guidebook. Factors to consider include, for example:

- Does the tributary, in combination with its adjacent wetlands (if any), have the capacity to carry pollutants or flood waters to TNWs, or to reduce the amount of pollutants or flood waters reaching a TNW?
- Does the tributary, in combination with its adjacent wetlands (if any), provide habitat and lifecycle support functions for fish and other species, such as feeding, nesting, spawning, or rearing young for species that are present in the TNW?
- Does the tributary, in combination with its adjacent wetlands (if any), have the capacity to transfer nutrients and organic carbon that support downstream foodwebs?
- Does the tributary, in combination with its adjacent wetlands (if any), have other relationships to the physical, chemical, or biological integrity of the TNW?

Note: the above list of considerations is not inclusive and other functions observed or known to occur should be documented below:

1. **Significant nexus findings for non-RPW that has no adjacent wetlands and flows directly or indirectly into TNWs.** Explain findings of presence or absence of significant nexus below, based on the tributary itself, then go to Section III.D: .

2. **Significant nexus findings for non-RPW and its adjacent wetlands, where the non-RPW flows directly or indirectly into TNWs.** Explain findings of presence or absence of significant nexus below, based on the tributary in combination with all of its adjacent wetlands, then go to Section III.D: .

3. **Significant nexus findings for wetlands adjacent to an RPW but that do not directly abut the RPW.** Explain findings of presence or absence of significant nexus below, based on the tributary in combination with all of its adjacent wetlands, then go to Section III.D: .

D. DETERMINATIONS OF JURISDICTIONAL FINDINGS. THE SUBJECT WATERS/WETLANDS ARE (CHECK ALL THAT APPLY):

1. **TNWs and Adjacent Wetlands.** Check all that apply and provide size estimates in review area:
   - ☐ TNWs: linear feet, width (ft) Or, acres.
   - ☐ Wetlands adjacent to TNWs: acres.

2. **RPWs that flow directly or indirectly into TNWs.**
   - ☐ Tributaries of TNWs where tributaries typically flow year-round are jurisdictional. Provide data and rationale indicating that tributary is perennial: .
   - ☐ Tributaries of TNW where tributaries have continuous flow "seasonally" (e.g., typically three months each year) are jurisdictional. Data supporting this conclusion is provided at Section III.B. Provide rationale indicating that tributary flows seasonally: .

   Provide estimates for jurisdictional waters in the review area (check all that apply):
   - ☐ Tributary waters: linear feet, width (ft).
   - ☐ Other non-wetland waters: acres.
     Identify type(s) of waters: .

3. **Non-RPWs[8] that flow directly or indirectly into TNWs.**
   - ☐ Waterbody that is not a TNW or an RPW, but flows directly or indirectly into a TNW, and it has a significant nexus with a TNW is jurisdictional. Data supporting this conclusion is provided at Section III.C.

   Provide estimates for jurisdictional waters in the review area (check all that apply):
   - ☐ Tributary waters: linear feet, width (ft).
   - ☐ Other non-wetland waters: acres.
     Identify type(s) of waters: .

4. **Wetlands directly abutting an RPW that flow directly or indirectly into TNWs.**
   - ☐ Wetlands directly abut RPW and thus are jurisdictional as adjacent wetlands.

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[8] See Footnote #3.

☐ Wetlands directly abutting an RPW where tributaries typically flow year-round. Provide data and rationale indicating that tributary is perennial in Section III.D.2, above. Provide rationale indicating that wetland is directly abutting an RPW: .

☐ Wetlands directly abutting an RPW where tributaries typically flow "seasonally." Provide data indicating that tributary is seasonal in Section III.B and rationale in Section III.D.2, above. Provide rationale indicating that wetland is directly abutting an RPW: .

Provide acreage estimates for jurisdictional wetlands in the review area: acres.

5. Wetlands adjacent to but not directly abutting an RPW that flow directly or indirectly into TNWs.

☐ Wetlands that do not directly abut an RPW, but when considered in combination with the tributary to which they are adjacent and with similarly situated adjacent wetlands, have a significant nexus with a TNW are jurisdictional. Data supporting this conclusion is provided at Section III.C.

Provide acreage estimates for jurisdictional wetlands in the review area: acres.

6. Wetlands adjacent to non-RPWs that flow directly or indirectly into TNWs.

☐ Wetlands adjacent to such waters, and have when considered in combination with the tributary to which they are adjacent and with similarly situated adjacent wetlands, have a significant nexus with a TNW are jurisdictional. Data supporting this conclusion is provided at Section III.C.

Provide estimates for jurisdictional wetlands in the review area: acres.

7. Impoundments of jurisdictional waters.[9]

As a general rule, the impoundment of a jurisdictional tributary remains jurisdictional.

☐ Demonstrate that impoundment was created from "waters of the UNITED STATES," or
☐ Demonstrate that water meets the criteria for one of the categories presented above (1-6), or
☐ Demonstrate that water is isolated with a nexus to commerce (see E below).

E. ISOLATED [INTERSTATE OR INTRA-STATE] WATERS, INCLUDING ISOLATED WETLANDS, THE USE, DEGRADATION OR DESTRUCTION OF WHICH COULD AFFECT INTERSTATE COMMERCE, INCLUDING ANY SUCH WATERS (CHECK ALL THAT APPLY):[10]

☐ which are or could be used by interstate or foreign travelers for recreational or other purposes.
☐ from which fish or shellfish are or could be taken and sold in interstate or foreign commerce.
☐ which are or could be used for industrial purposes by industries in interstate commerce.
☐ Interstate isolated waters. Explain: .
☐ Other factors. Explain: .

Identify water body and summarize rationale supporting determination: .

Provide estimates for jurisdictional waters in the review area (check all that apply):

☐ Tributary waters: linear feet, width (ft).
☐ Other non-wetland waters: acres.
Identify type(s) of waters: .
☐ Wetlands: acres.

F. NON-JURISDICTIONAL WATERS, INCLUDING WETLANDS (CHECK ALL THAT APPLY):

☒ If potential wetlands were assessed within the review area, these areas did not meet the criteria in the 1987 Corps of Engineers Wetland Delineation Manual and/or appropriate Regional Supplements.
☒ Review area included isolated waters with no substantial nexus to interstate (or foreign) commerce.
☐ Prior to the Jan 2001 Supreme Court decision in "*SWANCC*," the review area would have been regulated based solely on the "Migratory Bird Rule" (MBR).
☒ Waters do not meet the "Significant Nexus" standard, where such a finding is required for jurisdiction. Explain: see Section II.B.2 above and JDR.
☒ Other: (explain, if not covered above): refer to Figures and Hydrology Section in JDR.

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[9] To complete the analysis refer to the key in Section III.D.6 of the Instructional Guidebook.

[10] Prior to asserting or declining CWA jurisdiction based solely on this category, Corps Districts will elevate the action to Corps and EPA HQ for review consistent with the process described in the Corps/EPA *Memorandum Regarding CWA Act Jurisdiction Following Rapanos*.

Provide acreage estimates for non-jurisdictional waters in the review area, where the sole potential basis of jurisdiction is the MBR factors (i.e., presence of migratory birds, presence of endangered species, use of water for irrigated agriculture), using best professional judgment (check all that apply):

☐ Non-wetland waters (i.e., rivers, streams): linear feet, width (ft).
☐ Lakes/ponds: acres.
☐ Other non-wetland waters: acres. List type of aquatic resource: .
☐ Wetlands: acres.

Provide acreage estimates for non-jurisdictional waters in the review area that do not meet the "Significant Nexus" standard, where such a finding is required for jurisdiction (check all that apply):

☐ Non-wetland waters (i.e., rivers, streams): linear feet, width (ft).
☐ Lakes/ponds: acres.
☒ Other non-wetland waters: A total of acres.

List type of aquatic resource:

1. 10.81 acres of unvegetated ephemeral channel (*Riverine; Unconsolidated Bottom, Sand, Intermittently Flooded, Temporary, Well Drained/Fresh, Alkaline*),

2. 444.13 acres of vegetated ephemeral channel (Desert Dry Wash Woodland) (*Palustrine; Forested, Broad-Leaved, Evergreen, Intermittently Flooded/ Temporary, Well Drained/Fresh, Alkaline*). Vegetated ephemeral dry wash are desert washes that present an established bed, bank, and channel that support wash-dependent vegetation

Note: Only vegetated and unvegetated channel are considered as other nonwetland waters. Riparian interfluves are not included as other non-wetland waters because they do not exhibit an established bed or bank (as defined by 33 CFR 328.3[e] and other federal guidance [e.g., 2008 OHWM Delineation Manual, RGLs 88-06 and 05-05]) and are features which do not support wetland. Please refer to Table 10 in the JDR.

Note: Although Desert Dry Wash Woodland lacks the three characteristic features of a wetland (e.g., hydrophytic vegetation, hydric soils, and wetland hydrology) and is not considered a wetland community (as defined by 33 CFR 328.3[b]; 40 CFF 230.3[t]; the 1987 Manual; and the 2008 Supplement), this vegetation community still perform important wetland functions (*Review and Synopsis of Natural and Human Controls on Fluvial Channel Processes in the Arid West* ERDC/CRREL TR-07-16. Lichvar and Field 2007).

☐ Wetlands: acres.

SECTION IV: DATA SOURCES

A. SUPPORTING DATA. Data reviewed for JD (check all that apply - checked items shall be included in case file and, where checked and requested, appropriately reference sources below):

☒ Maps, plans, plots or plat submitted by or on behalf of the applicant/consultant: JDR with figures.
☐ Data sheets prepared/submitted by or on behalf of the applicant/consultant.
  ☐ Office concurs with data sheets/delineation report.
  ☐ Office does not concur with data sheets/delineation report.
☐ Data sheets prepared by the Corps: .
☐ Corps navigable waters' study: .
☐ UNITED STATES Geological Survey Hydrologic Atlas: .
  ☐ USGS NHD data.
  ☒ USGS 8 and 12 digit HUC maps.
☐ UNITED STATES Geological Survey map(s). Cite scale & quad name: 7.5' UNITED STATES Geological Survey (USGS) McCoy Wash (1975), McCoy Peak (1983), Ripley (1975), and Roosevelt Mine topographic quadrangles.
☐ USDA Natural Resources Conservation Service Soil Survey. Citation: .
☐ National wetlands inventory map(s). Cite name: .
☐ State/Local wetland inventory map(s): .
☐ FEMA/FIRM maps: The facility footprint is located within an area which presents possible but undetermined flood hazards (FEMA Flood Zone Designation D).

☐ 100-year Floodplain Elevation is: (National Geodetic Vertical Datum of 1929)
☒ Photographs: ☒ Aerial (Name & Date): USDA NAIP 2005.
or ☒ Other (Name & Date): Site Photos located in JDR (August 2009).
☐ Previous determination(s). File no. and date of response letter: .
☐ Applicable/supporting case law: .
☐ Applicable/supporting scientific literature: .
☒ Other information (please specify): Blythe Solar Plant Hydrology Report (AECOM 2009).

B. ADDITIONAL COMMENTS TO SUPPORT JD: refer to JDR and Figures.

ATTACHMENT 3

FIELD DATA AND SUBSAMPLING METHOD

Subsampling Method

To estimate total coverage of wash-dependent vegetation occurring within the major wash the weighted arithmetic mean was calculated where the estimate of absolute cover (χ) equals the sum of each sample of absolute cover (χi) multiplied by the area of each sample, or the weight (ωi), divided by the sum of all weights. The formula used was:
$\chi = \sum \omega i(\chi i)/\sum \omega i$ OR $X = \omega 1(\chi 1) + \omega 2(\chi 2) + \omega 3(\chi 3)\ldots / \omega 1 + \omega 2 + \omega 3\ldots$

Table 1
Primary Ephemeral Wash-Dependent Vegetation Cover Subsampling in the DARSA

Subsampling Area	Vegetated Ephemeral Dry Wash (DDWW)	Sampled Wash-Dependent Vegetation (DDWW)	Riparian Interfluve (DDWW)	Total Subsample area (ωi)	% Cover Wash-Dependent Vegetation (χi)	(ωi*χi)
1	1.22	0.02		1.24	1.61	0.02
2	0.5	0.13		0.63	20.63	0.13
3	1.52	0.33		1.86	17.74	0.33
4	0.1	0.14		0.24	58.33	0.14
5	2.1	0.46		2.56	17.97	0.46
6	2.13	0.23		2.39	9.62	0.23
7	0.83	0.38	0.01	1.22	31.15	0.38
8	0.83	0.35		1.18	29.66	0.35
9	3.85	1.32		5.17	25.53	1.32
10	2.68	1.09	2.36	6.15	17.72	1.09
11	0.18	0.13		0.31	41.94	0.13
12	0.21	0.18		0.39	46.15	0.18
13	0.57	0.29		0.86	33.72	0.29
14	4.92	1.85	8.03	14.8	12.50	1.85
15	0.55	0.07		0.62	11.29	0.07
16	0.59	0.19		0.78	24.36	0.19
17		0.31		0.31	100	0.31
18	0.96	0.26		1.26	20.63	0.26
19	0.71	0.22		0.99	22.22	0.22
SUM(ωi χi)*						*7.95*
SUM ωi						*42.96*
Weighted Mean SUM (ωi*χi)/SUM ωi						**0.19**

Raw Data (from GIS)

The raw GIS data for both the Proposed Project DARSA and Reconfigured Alternative DARSA are displayed below. These data were used to calculate the quantity of wash-dependent vegetation within the Proposed Project DARSA and Reconfigured Alternative DARSA based on subsampling results in the DARSA (see table above). While the subsampling method is detailed in the next section, the purpose of displaying this raw, unformatted data is to present in detail how the extrapolated wash-dependent vegetation is depicted in Table 6 of the JDR.

Table 2
Raw GIS Data for Jurisdictional Waters Occurring Within the Proposed Project DARSA

Sum of Acres	**Column Labels**			
Row Labels	**Inside**	**Upstream**	**Downstream**	**Grand Total**
DDWW	**197.04**	**7.22**	**137.49**	**341.76**
Riparian Interfluve	23.37	0.02	2.09	25.47
Vegetated Ephemeral Dry Wash	165.48	7.20	135.33	308.01
Wash-dependent Vegetation	8.20	0.01	0.07	8.28
Unvegetated Wash	**8.56**	**0.23**	**0.33**	**9.12**
Unvegetated Wash	8.56	0.23	0.33	9.12
Grand Total	**205.60**	**7.45**	**137.82**	**350.88**

Summing all DDWW gives a total of 341.76 acres (rounded to hundredths). However, substituting the 64.93 acres of extrapolated wash-dependent vegetation for the 8.28 acres of physically subsampled wash-dependent vegetation shown in Table 2 above, the total adds to 398.41 acres. The resultant 56.65 acres of "extra/overlap" area is due to the wash-dependent vegetation being interspersed throughout the non-subsampled area mapped as riparian interfluve and/or vegetated ephemeral dry wash. These areas cannot and should not be double-counted.

The 64.93 acres of wash-dependent vegetation is interspersed throughout the non-subsampled area mapped as riparian interfluve and/or vegetated ephemeral dry wash. Of this amount, 56.65 acres are extrapolated and 8.28 acres were physically mapped during subsampling. To ensure the extrapolated wash-dependent vegetation area was not double-counted, weighted proportions of the 56.65 acres were subtracted from both the 25.47 acres of riparian interfluve and the 308.01 acres of vegetated ephemeral dry wash. The ratio used for distributing the 56.65 acres was calculated as follows:

Table 3
Ratio Calculations for Distribution of Overlap for Components of Jurisdictional Waters of the State Occurring within the Proposed Project DARSA

For Riparian Interfluve (RI):	For Vegetated Ephemeral Dry Wash (VEDW):
(25.47 acres RI) / (25.47 acres RI + 308.01 acres VEDW) = 7.64% (56.65 acres)(0.0764) = **4.33 acres**	(308.01 acres VEDW) / (25.47 acres RI + 308.01 acres VEDW) = 92.36% (56.65 acres)(0.9236) = **52.32 acres**

Thus, 4.33 acres were subtracted from the riparian interfluve and 52.32 acres were subtracted from the vegetated ephemeral dry wash.

Table 4
Components of Jurisdictional Waters of the State Occurring within the Proposed Project DARSA

Type of Jurisdictional Water of the State	Acres
Unvegetated Ephemeral Dry Wash	9.12
Dry Desert Wash Woodland	341.76
Wash-Dependent Vegetation (based on weighted mean percent [19%])	*64.93*
Riparian Interfluve	*21.14*
Vegetated Ephemeral Dry Wash	*255.69*
Total Waters	**350.88**

Table 5
Raw GIS Data for Jurisdictional Waters Occurring Within the Reconfigured Alternative DARSA

Sum of Acres	Column Labels			Grand
Row Labels	Inside	Upstream	Downstream	Total
DDWW	**171.32**	**7.44**	**71.15**	**249.90**
Riparian Interfluve	12.78		1.04	13.81
Vegetated Ephemeral Dry Wash	157.84	7.44	69.52	234.80
Wash-dependent Vegetation	0.70		0.59	1.29
Unvegetated Wash	**4.96**	**1.28**	**0.59**	**6.83**
Unvegetated Wash	4.96	1.28	0.59	6.83
Grand Total	**176.28**	**8.72**	**71.74**	**256.73**

Summing all DDWW gives a total of 249.90 acres (rounded to hundredths). However, substituting the 47.48 acres of extrapolated wash-dependent vegetation for the 1.29 acres of physically subsampled wash-dependent vegetation shown in Table 5 above, the total adds to 296.09 acres. The resultant 46.19 acres of “extra/overlap” area is due to the wash-dependent vegetation being interspersed throughout the non-subsampled area mapped as riparian interfluve and/or vegetated ephemeral dry wash. These areas cannot and should not be double-counted.

The 47.48 acres of wash-dependent vegetation is interspersed throughout the non-subsampled area mapped as riparian interfluve and/or vegetated ephemeral dry wash. Of this amount, 46.19 acres are extrapolated and 1.29 acres were physically mapped during subsampling. To ensure the extrapolated wash-dependent vegetation area was not double-counted, weighted proportions of the 46.19 acres were subtracted from both the 13.81 acres of riparian interfluves and the 234.80 acres of vegetated ephemeral dry wash. The ratio used for distributing the 46.19 acres was calculated as follows:

Table 6
Ratio calculation for Distribution of Overlap for Components of Jurisdictional Waters of the State Occurring within the Reconfigured Alternative DARSA

For Riparian Interfluve (RI):	For Vegetated Ephemeral Dry Wash (VEDW):
(13.81 acres RI) / (13.81 acres RI + 234.80 acres VEDW) = 5.55% (46.19 acres)(0.0555) = **2.56 acres**	(234.80 acres VEDW) / (13.81 acres RI + 234.80 acres VEDW) = 94.55% (46.19 acres)(0.9455) = **43.63 acres**

Thus, 2.56 acres were subtracted from the riparian interfluve and 43.63 acres were subtracted from the vegetated ephemeral dry wash.

Table 7
Components of Jurisdictional Waters of the State Occurring within the Proposed Project DARSA

Type of Jurisdictional Water of the State	Acres
Unvegetated Ephemeral Dry Wash	6.83
Dry Desert Wash Woodland	249.90
Wash-Dependent Vegetation (based on weighted mean percent [19%])	*47.48*
Riparian Interfluve	*11.25*
Vegetated Ephemeral Dry Wash	*191.17*
Total Waters	**256.73**

ATTACHMENT F

WILDLIFE SPECIES DETECTED WITHIN THE COMBINED SURVEY AREA

WILDLIFE SPECIES DETECTED WITHIN THE COMBINED SURVEY AREA

Order	Scientific Name	Common Name
INVERTEBRATES		
Araneae		
	Family Theraphosidae	
	Aphonopelma chalcodes	desert tarantula
Order Coleoptera		Beetles
	Family *Meloidae*	Blister beetles
	Lytta magister	
Hymenoptera		Ants, Bees, Wasps and Sawflies
	Family Pompilidae	
	Pepsis sp.	tarantula hawk
Lepidoptera		Insects and Butterflies
	Family Danaidae	
	Danaus gilippus strigosus	striated queen
	Family Hesperidae	
	Erynnis funeralis	funereal duskywing
	Family Pieridae	
	Nathalis iole	dainty sulphur
	Pontia protodice	checkered white
	Family Lycaenidae	
	Brephidium exilis	pigmy blue
	Family Nymphalidae	
	Vanessa cardui	painted lady
	Vanessa virginiensis	Virginia lady
Orthoptera		Grasshoppers and Crickets
AMPHIBIANS		
Anura		**Frogs and Toads**
	Family Bufonidae	
	Bufo woodhousii	Woodhouse's toad
REPTILES		
Squamata		Lizards and Snakes
	Family Crotaphytidae	
	Crotaphytus collaris	collared lizard
	Crotaphytus bicinctores	great basin collared lizard
	Gambelia wislizenii	long-nosed leopard lizard
	Family Eublepharidae	
	Coleonyx variegatus	western banded gecko
	Family Iguanidae	
	Dipsosaurus dorsalis	desert iguana
	Sauromalus ater	common chuckwalla
	Family Phrynosomatidae	
	Uta stansburiana	side-blotched lizard
	Callisaurus draconoides	zebra-tailed lizard
	Sceloporus magister	desert spiny lizard
	Urosaurus graciosus	long-tailed brush lizard
	Phrynosoma platyrhinos	desert horned lizard
	Sceloporus magister	Desert spiny lizard
	*Uma scoparia**	Mojave fringe-toed lizard
	Family Teiidae	
	Cnemidophorus tigris	western whiptail

Order	Scientific Name	Common Name
	Family Colubridae	
	Chionactis occipitalis	western shovel-nosed snake
	Masticophis flagellum piceus	red coachwhip
	Pituophis melanoleucus	gopher snake
	Salvadora hexalepis	patch-nosed snake
	Sonora semiannulata	variable groundsnake
	Family Viperidae	
	Crotalus atrox	western diamond-backed rattlesnake
	Crotalus cerastes	sidewinder
	Crotalus mitchelli	speckled rattlesnake
Testundines		Turtles
	Family Testudinidae	
	Gopherus agassizii[1 2]	desert tortoise
BIRDS		
Ciconiiformes		Herons, Storks, Ibises, and Relatives
	Family Cathartidae	
	Cathartes aura	turkey vulture
Falconiformes		Diurnal Birds of Prey
	Family Accipitridae	
	Accipiter striatus[+]	sharp-shinned hawk
	Buteo jamaicensis	red-tailed hawk
	Buteo swainsoni[2]	Swainson's hawk
	Buteo regalis	ferruginous hawk
	Accipiter cooperii	Cooper's hawk
	*Circus cyaneus**	northern harrier
	Family Falconidae	
	Falco sparverius	American kestrel
	Falco mexicanus[+]	prairie falcon
Accipitriformes		
	Family Pandionidae	
	Pandion haliaetus	Osprey
Galliformes		Pheasants, Grouse, Quail and Relatives
	Family Odontophoridae	
	Callipepla californica	California quail
	Callipepla gambelii	Gambel's quail
Charadriiformes		Shorebirds, Gulls and Relatives
	Family Charadriidae	
	Charadrius vociferus	killdeer
	Family Scolopacidae	
Columbiformes		Pigeons and Doves
	Family Columbidae	
	Streptopelia decaocto	Eurasian collard dove
	Zenaida asiatica	white-winged dove
	Zenaida macroura	mourning dove
Caprimulgiformes		Goatsuckers and Relatives
	Family Caprimulgidae	
	Caprimulgus vociferus	whip-poor-will
	Chordeiles acutipennis	lesser nighthawk
	Phalaenoptilus nuttallii	common poorwill

Order	Scientific Name	Common Name
Cuculiformes		Cuckoos and Relatives
	Family Cuculidae	
	Geococcyx californianus	greater roadrunner
Strigiformes		Owls
	Family Strigidae	
	*Athene cunicularia**	burrowing owl
	Bubo virginianus	Great horned owl
Apodiformes		Hummingbirds and Swifts
	Family Apodidae	
	Aeronautes saxatalis	white-throated swift
	Family Trochilidae	
	Calypte anna	Anna's hummingbird
	Calypte costae	Costa’s hummingbird
Passeriformes		Song birds
	Family Tyrannidae	
	Empidonax oberholseri	dusky flycatcher
	Myiarchus cinerascens	ash-throated flycatcher
	Sayornis nigricans	black phoebe
	Sayornis saya	Say's phoebe
	Tyrannus verticalis	western kingbird
	Family Troglodytidae	
	Campylorhynchus brunneicapillus	cactus wren
	Salpinctes obsoletus	rock wren
	Family Laniidae	
	*Lanus ludovicianus**	loggerhead shrike
	Family Corvidae	
	Corvus corax	common raven
	Family Alaudidae	
	Eremophila alpestris[+]	horned lark
	Family Hirundinidae	
	Hirundo pyrrhonota	cliff swallow
	Hirundo rustica	barn swallow
	Stelgidopteryx serripennis	northern rough-winged swallow
	Tachycineta bicolor	tree swallow
	Tachycineta thalassina	violet-green swallow
	Family Regulidae	
	Regulus calendula	Ruby-crowned kinglet
	Family Remizidae	
	Auriparus flaviceps	verdin
	Family Mimidae	
	Mimus polyglottos	northern mockingbird
	Toxostoma sp.	thrasher
	Toxostoma lecontei	Le Conte’s thrasher
	Oreoscoptes montanus	Sage thrasher
	Family Muscicapidae	
	Polioptila melanura	black-tailed gnatcatcher
	Family Parulidae	
	Dendroica coronata	yellow-rumped warbler
	Dendroica petechia	yellow warbler
	Dendroica sp.	Townsend's or Hermit warbler
	Geothlypis tolmiei	Macgillivray's warbler
	Geothlypis trichas	Common yellowthroat

Order	Scientific Name	Common Name
	Vermivora celata	orange-crowned warbler
	Vermivora ruficapilla	Nashville warbler
	Wilsonia pusilla	Wilson's warbler
	Family Icteridae	
	Agelaius phoeniceus	red-winged blackbird
	Quiscalus mexicanus	Great-tailed grackle
	Euphagus cyanocephalus	Brewer's blackbird
	Family Cardinalidae	
	Pheucticus melanocephalus	black-headed grosbeak
	Family Emberizidae	
	Pipilo maculatus	Spotted Towhee
	Pipilo aberti	Abert's Towhee
	Amphispiza bilineata	Black-throated sparrow
	Spizella breweri	Brewer's sparrow
	Zonotrichia leucophrys	White Crowned Sparrow
	Spizella passerina	Chipping sparrow
	Family Fringillidae	
	Carpodacus mexicanus	house finch
	Family Sturnidae	
	Sturnus vulgaris	European Starling
	Family Vireonidae	
	Vireo cassinii	Cassin's vireo
	Vireo gilvus	Warbling vireo
Piciformes		
	Family Picidae	
	Picoides scalaris	Ladder-backed woodpecker
MAMMALS		
Lagomorpha		Rabbits, Hares, and Pikas
	Family Leporidae	
	Sylvilagus audubonii	Audobon's cottontail
	Lepus californica	black-tailed jackrabbit
Rodentia		Rodents
	Family Geomyidae	
	Thomomys bottae	Botta's pocket gopher
	Family Heteromyidae	
	Dipodomys sp.	kangaroo rat
	Dipodomys deserti	desert kangaroo rat
	Dipodomys merriami	Merriam's kangaroo rat
	Perognathus longimembris	little pocket mouse
	Chaetodipus sp.	pocket mouse species
	Family Scuiridae	
	Spermophilus tereticaudus	round-tailed ground squirrel
	Ammospermophilus leucurcus	antelope ground squirrel
	Family Cricetidae	
	Neotoma sp.	Woodrat
Carnivora		Carnivores
	Family Canidae	
	Vulpes macrotis arsipus	desert kit fox
	Urocyon cinereoargenteus	Grey fox
	Canis latrans	coyote
	Canis familiaris	domestic dog
	Family Mephitidae	

Order	Scientific Name	Common Name
	Mephitis mephitis	Striped skunk
	Family Mustelidae	
	*Taxidea taxus**	American badger
	Family Felidae	
	Lynx rufus	bobcat
Perissodactyla		Horses, Tapirs, and Relatives
	Family Equidae	
	Equus asinus	feral burro
Artiodactyla		Even-toed Ungulates
	Family Cervidae	
	Odocoileus hemionus	mule deer

[1] Federal threatened or endangered species
[2] State threatened or endangered species
[3] State fully protected species
*State Species of Special Concern
+State special animal/CDFG watch list

ATTACHMENT G

INFORMATION INDEX FOR DESERT TORTOISE SIGN

INFORMATION INDEX FOR DESERT TORTOISE SIGN
Burrows and Dens, Scats, and Shell Remains

From: USFWS *Field Survey Protocol for any Non-Federal Action That May Occur within the Range of the Desert Tortoise* (protocol) (USFWS 1992).

(1) Burrows and Dens:
1. currently active, with tortoise or recent tortoise sign
2. good condition, definitely tortoise; no evidence of recent use
3. deteriorated condition (please describe); definitely tortoise
4. deteriorated condition; possibly tortoise (please describe)
5. good condition; possibly tortoise (please describe)

(2) Scats:
1. wet (not from rain or dew) or freshly dried; obvious odor
2. dried with glaze; some odor; dark brown
3. dried; no glaze or odor; signs of bleaching (light brown), tightly packed material
4. dried; light brown to pale yellow, loose material; scaly appearance
5. bleached, or consisting only of plant fiber

(3) Shell Remains:
1. fresh or putrid
2. normal color; scutes adhere to bone
3. scutes peeling off bone
4. shell bone is falling apart; growth rings on scutes are peeling
5. disarticulated and scattered

ATTACHMENT H

REGULATORY AGENCY CORRESPONDENCE

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Ecological Services
Carlsbad Fish and Wildlife Office
6010 Hidden Valley Road, Suite 101
Carlsbad, California 92011

In Reply Refer To:
FWS-ERIV-09B0186-09SL0577

MAR 19 2009

Cecilia Meyer Lovell
EDAW Inc.
1420 Kettner Boulevard, Suite 500
San Diego, California 92101

Subject: Request for Information on Endangered and Threatened Species in the Vicinity of the Proposed Solar Millennium Blythe Project, Riverside County, California

Dear Ms. Lovell:

This letter responds to your March 2, 2009, letter (received March 4, 2009) requesting information on species of concern, including federally-listed or proposed species, or designated or proposed critical habitats that may occur in and around the Solar Millennium Blythe project solar thermal power generating facility being proposed on Bureau of Land Management (BLM) lands.

Section 7 of the Endangered Species Act of 1973 (Act), as amended, requires Federal agencies to consult with the U.S. Fish and Wildlife Service (Service) should it be determined that their actions may affect federally listed threatened or endangered species. Section 9 of the Act prohibits the "take" (*e.g.*, harm, harassment, pursuit, injury, kill) of federally listed wildlife. "Harm" is further defined to include habitat modification or degradation where it kills or injures wildlife by impairing essential behavioral patterns including breeding, feeding, or sheltering. Take incidental to otherwise lawful activities can be authorized under sections 7 (Federal consultations) and 10 (habitat conservation plans) of the Act.

If a proposed project is authorized, funded, or carried out by a Federal agency and may affect a listed species, then the Federal agency must consult with us on behalf of the applicant, pursuant to section 7 of the Act. During the section 7 process, measures to avoid and minimize project impacts to listed species and their habitat will be identified and incorporated into a biological opinion that includes an incidental take statement that exempts incidental take by the Federal agency and applicant.

TAKE PRIDE IN AMERICA

At this time, no candidate species occur within the vicinity of the proposed project. However, it appears that the federally-threatened desert tortoise (*Gopherus agassizii*) may occur on and/or in the vicinity of the proposed project. While we do not have site-specific species information for the proposed project area, federally-designated critical habitat for the desert tortoise (Chuckwalla Unit) is located south of the proposed project. Therefore, we recommend that you seek assistance from a biologist familiar with the habitat conditions and associated species, particularly desert tortoise, in and around the project site to assess the potential for direct, indirect and cumulative impacts likely to result from the proposed activity.

We also recommend that, for the 2009 field season, you conduct desert tortoise surveys following the Service's 1992 *Field Survey Protocol For Any Non-Federal Action That May Occur Within The Range Of The Desert Tortoise* and that all potentially suitable tortoise habitat in the action area associated with the proposed project be surveyed. The "action area" is defined by regulation as all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action (50 CFR §402.02). This analysis is not limited to the "footprint" of the action nor is it limited by the Federal agency's authority. Rather, it is a biological determination of the reach of the proposed action on listed species. Subsequent analyses of the environmental baseline, effects of the action, and levels of incidental take are based upon the action area.

Please also note that there may be BLM and State sensitive species concerns in this area. Therefore, we recommend that you contact the BLM and the California Department of Fish and Game to obtain lists of sensitive species that may occur in the vicinity of the proposed project and to determine which species may require surveys pursuant to the National Environmental Policy Act and California Environmental Quality Act.

Should you have any questions regarding this letter, survey protocols for federally-listed species, or your responsibilities under the Act, please call Tannika Engelhard of my staff at (760) 431-9440.

Sincerely,

for Karen A. Goebel
Assistant Field Supervisor

Enclosure

cc:
Kim Nicol, California Department of Fish and Game, Bermuda Dunes Field Office
Mark Massar, Bureau of Land Management, North Palm Springs Field Office

Federally Listed Species
Which Occur or May Occur on or Near the Proposed Solar Millennium Blythe Project, Riverside County, California

Common Name	Scientific Name	Status
REPTILES		
desert tortoise	*Gopherus agassizii*	T, CH

E: endangered
T: threatened
CH: critical habitat

EDAW | AECOM

EDAW Inc
1420 Kettner Boulevard, Suite 500, San Diego, California 92101
T 619.233.1454 F 619.233.0952 www.edaw.com

February 20, 2009

Julie Vance
California Department of Fish and Game
1234 East Shaw Avenue
Fresno, CA 95630

Dear Ms. Vance:

Subject: Biological Survey Methodologies for the Solar Millennium Projects

On behalf of Solar Millennium, LLC, EDAW/AECOM is submitting to the California Department of Fish and Game (CDFG) the attached summary of biological resource survey studies and methodologies for Solar Millennium's three proposed solar thermal power plant sites in the Mojave and Colorado Desert areas of California. The three plant sites include the Ridgecrest site located south of Ridgecrest in Kern County, the Palen and Blythe plant sites located near Desert Center and Blythe, respectively.

The AECOM Team is undertaking technical surveys and studies necessary to support Applications for Certification (AFC) submittals and related environmental documentation to be provided to the California Energy Commission (CEC) and the Bureau of Land Management (BLM). These studies will also be used to develop environmental baseline information to support applications to other federal, state, and local agencies.

Key to obtaining the approvals described above is the collection of data concerning the occurrence and distribution of biological resources on the three project sites. The biological site surveys and data collection must, of course, take into account the physical characteristics of the project sites, the life histories of the target species, and the guidelines and protocols promulgated by the resource agencies.

The data resulting from these surveys will be used for characterizing existing biological resource conditions on the project sites. Some modifications to solar plant component configurations may occur as a result of survey findings. The survey results will of course also be used to make determinations regarding project impacts, to formulate mitigation requirements, and to provide specific data needs of reviewing agencies.

A conference call meeting was held with representatives of CDFG, the US Fish and Wildlife Service (USFWS), the BLM, Solar Millennium, LLC, and the AECOM team on February 11, 2009. At that time EDAW/AECOM provided a summary of the biological surveys and protocols proposed for each of the three plant sites. After some discussion of the proposed survey protocols, it was requested by the agencies that a written summary of the survey methodologies, together with more detailed mapping of the proposed projects, be submitted. This letter provides the materials requested during the February 11, 2009 meeting.

In submitting this information, it is our hope to gain timely review and comment by CDFG and the other resource management agencies that participated in the meeting. It is Solar Millennium's desire to

share its expectations and comments in the planning stage for these studies so that the ensuing study bases and work products reflect the Department's input. This review, and ultimate survey protocol concurrence, is critical to meeting temporal requirements of various surveys and project delivery schedules.

During our call on February 11th, it was indicated that the agencies would review these materials during the week of February 23rd. It was further indicated that combined feedback from the agencies would be received during the first week in March. I will be contacting you shortly to establish a forum for receiving your feedback.

Please do not hesitate to contact me if I can provide any needed information in the interim.

Sincerely,

William Graham
Principal

bill.graham@edaw.com
ph. 619.233.1454

Protocal Trans Letter 2 20 09.doc

Proposed Survey Protocols for the Solar Millennium Parabolic Trough Solar Thermal Power Projects 2009

Desert Tortoise

- Surveys will be conducted according to the U.S. Fish and Wildlife Service (USFWS) *Field Survey Protocol For Any Federal Action That May Occur Within the Range of the Desert Tortoise* (January 1992), and modified to exclude the survey of Zone of Influence transects, as recommended by Ray Bransfield of the USFWS, Ventura Field Office. The rationale for this modification is that ZOI transect surveys would not provide much additional information for the forthcoming Section 7 consultation process, and that effects to the tortoise would be addressed through the consultation process. Although this recommendation was specific to the Ridgecrest site, the Solar Millennium project team is proposing that this modification to the standard survey methodology be applied to all three sites (i.e., applied to the Ridgecrest, Palen, and Blythe sites), since all would be going through similar consultation processes, and the projects are located on lands under the jurisdiction of the BLM. Although the CDFG has raised concerns regarding indirect effects of potential increases in raven and other predator populations due to the use of evaporation ponds in the project design, it should be noted that all three sites, with the possible exception of one unit at the Blythe site, will be using dry cooling, and that evaporation ponds will not be used in conjunction with dry cooling. There will be stormwater retention ponds, but they will hold water only for a few days of the year, and thus should not affect raven populations. Therefore, the Solar Millennium team is proposing that no ZOI transect surveys be conducted (including forgoing ZOI surveys along the CEC 0.75-mile and 1.0-mile buffer transects).
- Habitat assessments will be initiated in February and will be conducted by qualified biological teams. A Presence-or-Absence Survey (100 percent survey) over the entire project area will be conducted. Surveys will be initiated in mid-March, after it has been determined that desert tortoises are active and will continue roughly until the end of May.
- Intensive Surveys will be conducted at the completion of focused surveys to determine survey quality.
- While conducting biological surveys, all tortoise sign (live tortoises, shells, bones, scutes, limbs, scat, burrows, pallets, tracks, egg shell fragments, drinking sites etc.) will be mapped using GPS units and on field maps (scale 1”=200’). Other sensitive biological resources will be mapped during desert tortoise focused surveys (see General Biological Survey Details below).

Burrowing Owl

- Biologists will conduct focused surveys for the western burrowing owl (*Athene cunicularia)* according to the *BURROWING OWL SURVEY PROTOCOL AND MITIGATION GUIDELINES* prepared by The California Burrowing Owl Consortium (April 1993).
- The habitat assessment (Phase I Survey) for burrowing owl will be conducted in February by qualified biologists. The project site and surrounding 500’ buffer zone will be evaluated for the suitability for burrowing owl. Suitable habitat will be mapped in the field using high resolution field maps and GPS units. Any burrowing owls or burrowing owl sign observed during the Phase I survey will be recorded and mapped.
- The Phase II Burrow Survey will be initiated in mid-March and will be conducted concurrently with focused desert tortoise surveys. The burrow survey will consist of pedestrian transects spaced at

a maximum of 10 meters apart within suitable desert tortoise habitat and in any areas not suitable for tortoise may extend up to 30 meters. Biologists conducting tortoise surveys will map any burrowing owls, potential burrowing owl burrows and burrowing owl sign.

- Phase III surveys (burrowing owl surveys, census and mapping) will be initiated at the height of the breeding season (April 15th until July 15th) and will continue until all potential burrowing owl locations have been visited on four separate survey periods. Potential burrowing owl locations will be viewed initially using the vehicle as a blind (if possible) and in all cases, will be surveyed by biologists approaching the burrows on foot. Burrows will be assessed for any fresh burrowing owl activity and sign. Any sensitive species observed during these surveys will be recorded.

Mohave Ground Squirrel (Ridgecrest Site Only)

- Protocol-level surveys to be conducted per CDFG's Mohave Ground Squirrel Survey Guidelines (revised January 2003). Since the site acreage is greater than 180 acres a specialized survey methodology will need to be developed through consultation with CDFG, the project proponent and the lead agency
- The Ridgecrest site consists of monotypic creosote bush scrub that is generally open with large patches of shrubless areas. Preliminary analysis of the site by MGS expert Bill Vanherweg indicates that the site consists of marginal MGS habitat due to the scarcity of food plants.
- EDAW proposes to that MGS surveys consist of one trapping grid per Section of land (4 grids) plus two additional grids along the CEC buffers (at 0.75 and 1 mile from the outer edge of the proposed disturbance footprint) for a total of 6 grids. No trapping is proposed within the MGS Conservation Area south of Brown Road. All of the linear features for this site are within the site footprint, so no trapping grids are proposed for these items.

Botanical Surveys

Rare plant surveys will be conducted according to CNPS Survey Guidelines.

- Vegetation mapping of plant footprints and linear project features (per Holland 1986)
- Vegetation mapping of 1-mile buffer around plant footprint 1,000-foot buffer along linear features, per the *California Energy Commission – Recommended Biological Resources Field Survey Guidelines for Large Solar Projects* (May 2007)
- Focused surveys for special-status species (see species table provided separately)

General Biological Survey Details

While conducting surveys for desert tortoise, burrowing owl and rare plants, biologists will also be looking for and recording occurrences of other sensitive and listed wildlife species.

- **Burrowing Owl Burrow Data** – Phase II of the Burrowing Owl survey (mapping potential burrowing owl burrows) is to be conducted concurrently with the Desert Tortoise focused survey by the biologists conducting the desert tortoise survey. All potential burrowing owl burrows and any potential burrowing owl sign, including owl observations, white wash, pellets, feathers etc. will be recorded
- **Desert Tortoise Training** – All surveyors will be given Desert Tortoise Awareness training.
- **Rare Plants –** All surveyors will be briefed on potential rare plants within their survey area, including descriptions and photographs/drawings. Biologists will record co-ordinates and take

photographs of any potential occurrences of rare plants and communicate this information to an EDAW botanist for verification immediately.

- **Other Special Status Wildlife Species** – During desert tortoise, rare plant and burrowing owl surveys, any of the following biological resources will be noted and locations recorded:
    - Any observations of sensitive and/or listed mammal species sign including but not limited to:
        - Potential bat roosting sites – caves, abandoned buildings, cliffs etc.
        - Nelson's bighorn sheep or sign
        - American badger
        - Mojave ground squirrel
        - Desert kit fox burrows
    - Any observations of Mojave fringe-toed lizard (in dunes)
    - Any observations of sensitive and/or listed bird species including but not limited to:
        - Loggerhead shrike
        - LeConte's thrasher
        - Bendire's thrasher
        - Crissal's thrasher
        - Gilded flicker
        - Gila woodpecker
        - Raptors
            - Northern harrier
            - White-tailed kite
            - Cooper's hawk
            - Peregrine falcon
            - Prairie falcon
            - Swainson's hawk
            - Golden eagle
            - Ferruginous hawk

-----Original Message-----
From: Shelley_Ellis@ca.blm.gov [mailto:Shelley_Ellis@ca.blm.gov]
Sent: Friday, March 06, 2009 2:42 PM
To: Graham, Bill
Subject: RE: Surveys

Hi Bill,
The agencies had a conference call and determined various small changes to your proposed surveys. Kim Nicol from CA DFG will send the finalized survey requirements to Solar Millennium early next week . I believe the '92 ZOI's are not necessary, as Ray mentioned at the conference call that you attended at the BLM. BLM requires bird Point Counts on proposed solar sites, but that will be covered in the information that you receive on Monday (hopefully, on Monday) from CA DFG. So I was a bit premature in saying anything so soon.

Thanks, Shelley

Shelley Ellis
BLM Wildlife Biologist
300 S. Richmond
Ridgecrest
CA 93555
760-384-5426

"Graham, Bill"<Bill.Graham@edaw.com>To <Shelley_Ellis@ca.blm.gov>
03/06/2009 01:54 PM
Subject RE: Surveys

Shelley:

Some clarification please. In your subsequent email you indicated our proposed survey methodologies were acceptable, but here you indicate a need to follow the complete protocol. Our proposed methodology would incorporate CEC buffers but not complete 92 protocol ZOIs. We're OK either way but I just need clarification, as we start on Monday.

Regards,

Bill G.

-----Original Message-----
From: Shelley_Ellis@ca.blm.gov [mailto:Shelley_Ellis@ca.blm.gov]
Sent: Tuesday, March 03, 2009 3:03 PM
To: Graham, Bill
Subject: Surveys

Hi Bill,

I called Ray Bransfield with USFWS, and we concluded that you need
To follow the 1992 tortoise survey protocol. Do you have any questions about the botany survey? I can get you the BLM protocol, which I'm hoping is similar to the CEC protocol. We are not aware of any BLM special

status plant species there. The area needs to be 100% surveyed for burrowing owls, their burrows, and sign. They usually nest a little later than this. But they generally use the old burrows from previous years. The only other biological survey is the Mojave Ground Squirrel. For that, you need to talk to CA DFG. They never contacted me. BLM will defer to whatever they require. This is a list of all the plants we are aware of that occur on our BLM lands. Let me know if you need other information.

(See attached file: Plants_Checklist_0107.doc)

Thanks, Shelley

Shelley Ellis
BLM Wildlife Biologist
300 S. Richmond
Ridgecrest
CA 93555
760-384-5426

-----Original Message-----
From: Larry_LaPre@ca.blm.gov [mailto:Larry_LaPre@ca.blm.gov]
Sent: Tuesday, March 10, 2009 3:18 PM
To: lflapre@ca.blm.gov
Cc: Colin_Grant@blm.gov; Christopher_Otahal@ca.blm.gov;
Mark_Massar@ca.blm.gov; Shelley_Ellis@ca.blm.gov; Jesse_Irwin@ca.blm.gov
Subject: message to consulting biologists re bird studies

This message has several biologists listed as bcc recipients.

As you know, BLM is requiring bird point count surveys on solar sites as part of the baseline environmental information. For many years BLM and other agencies have used bird abundance and diversity as a general measure of the quality and productivity of a particular site. In addition, knowing the birds present will help later with compliance with the Migratory Bird Treaty Act, which disallows destruction of any active bird nests.

Colin Grant and I have had many calls from consulting biologists about the methodology, which follows Ralph et al 1992, with some modifications. The general guidelines are provided In the attachment below.

Since I spoke to you, BLM has decided that:

1. Point count duration is 10 minutes. This will prevent double-counting and allow the surveys to be completd before 9 AM or so, at least before it gets too hot.

2. BLM will be flexible on the locations of each point count transect. The requirement is one per square mile. On a ten square mile site, the ten transects do not have to be evenly spaced within each section. They should be put in the best areas for birds or the areas most representative of each vegetation community type.

3. BLM will be flexible on the time period for completing the spring surveys. The requirement is March and April, but the surveys can continue into May if you can't meet the early schedule or if it is better to do so because of late-nesting species. The flexibility is with the word "consecutive."

Stick to the time period, the transect length, the transect spacing and the count circle radius so that the studies from each site are comparable.

Thank you for your efforts in obtaining environmental baseline information which will assist BLM in evaluating the solar applications.

(See attached file: BLM Solar Facility Point Count Protocol.docx)

Dr. Larry LaPre
District Wildlife Biologist
California Desert District
Bureau of Land Management
22835 Calle San Juan de los Lagos
Moreno Valley, CA 92553
Phone: (951) 697-5218
Fax: (951) 697-5299
E-mail: llapre@ca.blm.gov

-----Original Message-----
From: Shelley_Ellis@ca.blm.gov [mailto:Shelley_Ellis@ca.blm.gov]
Sent: Tuesday, March 03, 2009 3:03 PM
To: Graham, Bill
Subject: Surveys

Hi Bill,

I called Ray Bransfield with USFWS, and we concluded that you need to follow the 1992 tortoise survey protocol. Do you have any questions about the botany survey? I can get you the BLM protocol, which I'm hoping is similar to the CEC protocol. We are not aware of any BLM special status plant species there. The area needs to be 100% surveyed for burrowing owls, their burrows, and sign. They usually nest a little later than this. But they generally use the old burrows from previous years. The only other biological survey is the Mojave Ground Squirrel. For that, you need to talk to CA DFG. They never contacted me. BLM will defer to whatever they require. This is a list of all the plants we are aware of that occur on our BLM lands. Let me know if you need other information.

(See attached file: Plants_Checklist_0107.doc)

Thanks, Shelley

Shelley Ellis
BLM Wildlife Biologist
300 S. Richmond
Ridgecrest, CA 93555
760-384-5426

-----Original Message-----
From: Shelley_Ellis@ca.blm.gov [mailto:Shelley_Ellis@ca.blm.gov]
Sent: Tuesday, March 03, 2009 3:19 PM
To: Graham, Bill
Subject: your survey protocols

Bill,

I looked again at the protocol attachment you e-mailed for the biological surveys, and those protocols will be fine as far as BLM is concerned.

Thanks, Shelley

Shelley Ellis
BLM Wildlife Biologist
300 S. Richmond
Ridgecrest, CA 93555
760-384-5426

Re: Solar Millennium Projects Biological Survey Protocols
From: Graham, Bill
Sent: Tuesday, July 28, 2009 11:31 AM
To: MeyerLovell, Cecilia
Subject: FW: Solar Millennium Projects Biological Survey Protocols

Bill Graham
Principal
D +1 619.764.6806 M +1 619.302.7426
New email: bill.graham@aecom.com
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www.edaw.com www.aecom.com

From: David Hacker [mailto:DHACKER@dfg.ca.gov]
Sent: Tuesday, March 17, 2009 4:00 PM
To: Julie Vance; Kimberly Nicol; Graham, Bill
Cc: Holly_Roberts@blm.gov; shelley_ellis@ca.blm.gov; Ryork@energy.state.ca.us; Luttrell, Mark; Ray_Bransfield@fws.gov; Tannika_Engelhard@fws.gov; Jessie Audette
Subject: RE: Solar Millennium Projects Biological Survey Protocols

Mr. Graham:

As we discussed on the February 10, 2009 WebEx meeting with CEC, DFG, BLM, and the USFWS, any predetermined mitigation under the West Mohave Plan pertains to BLM policy only. The State incidental take authorization requirement would be to "fully mitigate" the impacts of the Mohave ground squirrel taking, including all impacts on the species (14 CCR § 783.4). The location of those impacts relative to Brown Road would be important only if Brown Road is the boundary between areas of different habitat values. We look forward to working with you and your biologists to determine whether this is the case.

For Mohave ground squirrel survey methods, we've made recommendations in a forthcoming letter. The gist of it is that the proposed survey methods (1 trap grid per 640 acres) would be insufficient to determine absence, and that inferring presence based on habitat suitability and the nearby occurrences is an option. Trapping at the standard one grid per 80 acres is still an option as well. If you decide to forego trapping and pursue incidental take authorization, we'll work with you to develop mitigation based solely on habitat value. Please feel free to call with any questions.

Dave Hacker
Staff Environmental Scientist
California Department of Fish and Game
3196 South Higuera St., Suite A
San Luis Obispo, CA 93401
805.594.6152

>>> "Graham, Bill" <Bill.Graham@edaw.com> 3/13/2009 5:44 PM >>>

Kim:

Thank you very much for forwarding this joint agency review of our proposed biological survey protocols for the Solar Millennium projects at Ridgecrest, Palen and Blythe. We will implement this direction immediately in most cases. There are a few areas where we need some additional discussion. I summarize our understanding and short-term action items below, organized by species:

Desert Tortoise

We appreciate your collective acceptance of our DTO survey methodology. This will essentially conform to the 1992 USFWS protocol with the exception of ZOI surveys. We will survey the CEC required buffers.

We will endeavor to ensure that there are no violations of Section 9 of the ESA during survey activity.

We will forward you a complete list of desert tortoise surveyors, both EDAW AECOM employees and independent contractors, on Monday.

Burrowing Owl

It is our understanding that you desire additional detail regarding the criteria utilized for determining burrowing owl habitat. We will forward additional information concerning this issue shortly for the review of CDFG, BLM, and USFWS. You (Kim Nicol) will be our primary contact for any additional discussion of burrowing owl survey protocol.

You are correct in that, in the referenced passage, "desert tortoise" should be replaced with "burrowing owl."

Mojave Ground Squirrel

It is understood that the other agencies will defer to CDFG regarding MGS survey protocols. After discussions with senior CDFG staff, our thinking has changed regarding this issue. It is understood that MGS mitigation for the portion of the Ridgecrest site south of Brown Road, as a result of this areas location within the Western Mojave Plan's MGS Conservation Area, is predetermined. On remaining portions of the site, our current thinking is that a negotiated mitigation based on mutual assessment of habitat quality is appropriate. This strategy is largely a result of our being informed that negative survey results would not necessarily be regarded as evidence of a lack of MGS occupation.

Dave Hacker of CDFG will be our primary contact regarding MGS issues.

Botanical Surveys

It is understood that there is concurrence with the proposed botanical survey protocol, with the following additions:

1) Succulents/yucca/Joshua Trees/barrel cactus are to be mapped and counted. This will facilitate later salvage.

2) BLM sensitive species will be photodocumented.

General Biological Survey Details

There is general concurrence with our protocols.

All surveyors will attend Tortoise Awareness Training. It is understood that absolutely no handling of DTO is required.

Point Count Bird Surveys

Point Count Bird Surveys were not originally proposed by EDAW AECOM. We intend to have additional discussions with BLM concerning whether these surveys are in fact warranted. It is understood that resolution must be obtained in the very near future as a result of survey windows.

The instructions included regarding the point count surveys are noted. We have subsequently received additional direction from Larry LaPre; it is our understanding that he will be the primary point of contact regarding point count surveys. We have had several discussions with Dr. LaPre, and in the process have reached agreement regarding some modifications (e.g., count locations per transect, duration of each point count, etc.) to the methodology. Our assumption is that, should these surveys be implemented, surveys conducted in accordance with Dr. LaPre's instructions will be acceptable to the BLM.

Please contact me if the above differs from your understanding in any respect.

William Graham
Principal, Planning & Environment
EDAW D 619.764.6806 C 619.302.7426bill.graham@edaw.com

From: Kimberly Nicol [mailto:KNICOL@dfg.ca.gov]
Sent: Tue 3/10/2009 9:32 AM
To: Julie Vance; Graham, Bill
Cc: shelley_ellis@ca.blm.gov; David Hacker; Ryork@energy.state.ca.us; Luttrell, Mark; Ray_Bransfield@fws.gov; Tannika_Engelhard@fws.gov; Jessie Audette

Subject: Re: Solar Millennium Projects Biological Survey Protocols

Bill,

This email serves as a joint agency response to Solar Millennium’s request for review of their proposed biological survey protocols. The proposed survey protocol document, “Proposed Survey Protocols for the Solar Millennium Parabolic Trough Solar Thermal Power Projects, 2009” was provided to representatives of the following agencies via email on February 20, 2009, for review and concurrence: California Department of Fish and Game (CDFG), California Energy Commission (CEC), U.S. Bureau of

Land Management (BLM), and U.S. Fish and Wildlife Service (FWS). The following agency review and concurrence applies to Solar Millennium's Ridgecrest, Palen, and Blythe project sites only.

DESERT TORTOISE
CDFG, BLM, and FWS concur with the proposed protocol for this species. CEC also concurs with the proposed protocol with the addition of the following requirement:

? CEC Data Adequacy Regulations require project applicants to ".. . include a list of species actually observed and those with a potential to occur within 1 mile of the project site and 1000 feet from the outer edge of linear facility corridors".

Please note the FWS' concurrence on the survey protocol design does not authorize the take of desert tortoises. Take, as described in section 9 of the Endangered Species Act of 1973 (ESA), as amended, and the FWS' regulations is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. Harassment is defined by the FWS as intentional or negligent action that creates the likelihood of injury to listed species by annoying it to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding, or sheltering. Harm is further defined by the FWS to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering (50 CFR 17.3). Also note that, pursuant to the ESA and its implementing regulations, desert tortoises may not be handled in any manner without prior ESA authorization.

To ensure the quality of the protocol survey, we recommend that you provide the names and qualifications of the surveyors to FWS, CDFG, and BLM for review prior to initiating surveys.

BURROWING OWL
CEC, BLM, and FWS defer to CDFG regarding survey protocol for this species. CDFG has the following comments on the proposed survey protocol:

? The survey protocol should describe what criteria will be used to determine suitable burrowing owl habitat. This should be presented to CDFG, CEC, and BLM, prior to initiating the surveys.
? The proposed survey protocol states "The burrow survey will consist of pedestrian transects spaced at a maximum of 10 meters apart within suitable desert tortoise habitat and in any areas not suitable for tortoise may extend up to 30 meters." Should this say within suitable burrowing owl habitat? It is not clear why Phase II surveys would only occur in suitable tortoise habitat and not burrowing owl habitat.

Solar Millennium should contact Kim Nicol of CDFG for additional discussion on the survey protocol for burrowing owl.

MOHAVE GROUND SQUIRREL

CEC, BLM, and FWS defer to CDFG regarding survey protocols for this species. Solar Millennium should contact Dave Hacker of CDFG Region 4 for additional discussion on the survey protocol for this species at the Ridgecrest project site.

BOTANICAL SURVEYS
CDFG, CEC, and FWS concur with the proposed botanical survey protocols. BLM also concurs with the proposed protocols with the addition of the following:

? Solar Millennium should abide by BLM guidance/requirements regarding mapping/surveying for succulents/yucca/barrel cactus. If solar development of any of the sites is approved, BLM will require salvage and transplantation of the succulents. A count of the number of barrel cacti, Joshua trees, or Mojave yuccas should be compiled.
? BLM requests photographic documentation of any BLM sensitive species found.

GENERAL BIOLOGICAL SURVEY DETAILS
CDFG, CEC, BLM, and FWS concur with the proposed survey protocols/actions outlined in this section with the following clarifications/additions:

Desert Tortoise Training: please ensure that all surveyors attending Desert Tortoise Awareness training are aware that handling of desert tortoise during protocol surveys is not authorized and implementation of the survey protocol, as described by Solar Millennium does not require handling of desert tortoises in any manner.

Other Special Status Wildlife Species: BLM requires point count bird surveys on all solar development sites on their lands using the following protocol:
-one point count transect per square mile
-eight point count locations per transect
-point counts must be 250 meters apart
-one day a week for four consecutive weeks between March and April (breeding)
-one day a week for four consecutive weeks between November and January (wintering)
-each point count will be twenty minutes long with a 100 meter radius
-concentrate on areas where there will be birds (washes, high vegetation areas, ect)
-point counts will be conducted between 5-9 am Solar Millennium should contact the local BLM office for additional discussion on the bird survey protocol.

If you have any questions, please feel free to contact the above people.

Kim

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>>> "Graham, Bill" <Bill.Graham@edaw.com> 2/20/2009 6:38 PM >>>
Julie:

A cover letter and a memo summarizing the biological survey methodologies and protocols are attached. During the web meeting last week, you also requested more detailed site plans. These maps will be forwarded on Monday.

Regards,

William Graham
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ATTACHMENT I

LIST OF CUMULATIVE PROJECTS

Attachment I
List of Cumulative Projects

Project Name	Location/Jurisdiction	Shown on Figure 14?	Project Description	Biological Resources that Occur or Potentially Occur Onsite
Chevron/Solar Millennium, Blythe Solar Power Project (CACA 048811)	West of Blythe, to the north of the Interstate 10 corridor in Riverside County, California	Yes	The Blythe Solar Power Project is a 1,000 MW solar thermal project using parabolic trough technology; the plant's output will be generated by four identical 250 MW plants. The project is proposed on a 9,560-acre BLM ROW north of I-10 and approximately eight miles west of Blythe; approximately 7,251 acres of this total will be disturbed. The Project will include a 6.1-mile 500 kV transmission line to interconnect with the regional grid at the planned Midpoint Substation south of I-10. Construction is scheduled to begin at the end of 2010 and one 250 MW unit will come line in each of 2013, 2014, 2015, and 2016; the total construction period is estimated at 69 months. Construction employment is expected to average approximately 604 workers and to peak at approximately 1,000 workers. Total operational employment will be approximately 300 (75 per plant).	Special status species on the site include desert tortoise, and burrowing owl.
Optisolar (subsequently acquired by First Solar), Desert Quartzite Solar Farm (CACA 49377)	South side of I-10 approximately eight miles southwest of the City of Blythe in eastern Riverside County	Yes	The Desert Quartzite project is a 601 MW solar photovoltaic power generating facility, proposed on public lands on a 7,724-acre site (total size of BLM right of way [ROW] application). The site would interconnect to the proposed Midpoint Substation, which is proposed for a location adjacent to the Desert Quartzite facilities, thus there would be essentially no offsite transmission line. The existing Devers Palo Verde #1 transmission line runs through the southern portion of the Desert Quartzite site. The Mule Mountain Area of Critical Environmental Concern (ACEC) is adjacent to the south of the site. The Plan of Development (POD), indicates that facilities will be laid out to provide a "reasonable" buffer between the project and the ACEC. The total graded area that will contain all facilities is expected to be approximately 150 acres, about two percent of the total ROW area. The POD indicates that historic cultural resources may occur within the project area, but that no	The site is characterized as desert bush scrub and dry desert wash woodlands, and the special-status desert tortoise (DT) is found onsite in what is described as low-quality (Class III) DT habitat.

Project Name	Location/Jurisdiction	Shown on Figure 14?	Project Description	Biological Resources that Occur or Potentially Occur Onsite
			studies had yet been performed. The POD indicates a three to four year construction schedule, but does not indicate expected construction start or operational dates. Construction might start in mid-2010 and the facility might come on line in roughly 2013 to 2014. The POD indicates an average workforce of 250 (peak of 400-500). The operational workforce is expected to be approximately 10 workers.	
Optisolar (subsequently acquired by First Solar), Desert Sunlight Solar Farm (CACA 048649)	North of Desert Center	Yes	The DSSF will be a 550 MW solar photovoltaic (PV) electrical generating facility on BLM land with a ROW that would cover over 25,000 acres. This ROW would encompass both the generating facilities and an approximately XX-mile transmission corridor to interconnect the facilities with the regional grid at Southern California Edison's (SCE) planned Red Bluff Substation south of the plant site. The POD indicates a three-year construction schedule with an average workforce of 250 (peak of 400-500). The operational workforce is expected to be approximately 10 workers.	Special status species found on the site include desert tortoise (although it is considered low quality tortoise habitat), Western burrowing owl (WBO), desert kit fox, and Le Conte's thrasher.
Bullfrog Green Energy LLC, Mule Mountain Solar Project (CACA 49097)	South of I-10 west of Blythe (and adjacent to the Desert Quartzite Solar Farm site discussed above).	Yes	The Mule Mountain Project is a 500 MW concentrating PV power generating facility proposed on 6,629 acres of BLM-managed land. The project is to be developed in three separate, approximately 170 MW phases. The POD indicated that there were several transmission options under consideration, one of them being the planned Midpoint Substation close to the site. Approximately nine percent of the total site acreage would be impacted by project development. As indicated in the POD (Bullfrog, 2009) construction of the first 170 MW phase in planned for early 2011 and to continue until complete construction of the third phase in mid-2013. Because of the phased construction schedule, construction labor is estimated to be no more than 35-50 workers; a very small (less than 20) operational work force will be needed.	Primary identified special-status species are the Colorado fringe-toed lizard and perhaps WBO.

Project Name	Location/Jurisdiction	Shown on Figure 14?	Project Description	Biological Resources that Occur or Potentially Occur Onsite
Genesis Solar LLC, Genesis Solar Energy Project (CACA 48880)	Approximately two miles north of I-10 and 25 miles west of Blythe	Yes	This project is proposed to be developed on a 4,640-acre BLM ROW. Formerly known the Ford Dry Lake Project, the facility would be a 250 MW solar thermal generating facility utilizing parabolic trough technology. The POD indicates an assumed December 2010 project approval date (by both BLM and the CEC) and a 25-month construction schedule. The expected facility footprint is expected to be 1,800 acres of the 4,640-acre ROW; the project will include a four-mile offsite natural gas pipeline and a 5.5-mile transmission line, interconnecting with the currently under-construction Blythe Energy Center to Julian Hinds transmission line. The construction work force is expected to average 650 and peak at 950 workers; operating phase employment is estimated at 65.	The Project has performed DT and WBO surveys as well as other biological surveys; and identified special-status species include Mojave and Colorado fringe toed lizards, loggerhead shrike, WBO, short-eared owl, prairie falcon, and northern harrier. No live DTs were found but there were burrows and bones on the site and tracks and carcasses in the surrounding Zones of Influence.
enXco, Mule Mountain Soleil Project (CACA 49488)	North of I-10 and 10 miles west of Blythe.	Yes	The Mule Mountain Soleil project is a 200 MW solar photovoltaic generating facility. The site is proposed on a 2,100-acre BLM (including 40 acres for the transmission line ROW), with the project expected to disturb 1,640 acres of this total. Approximately 10 percent of the site would be cleared; other vegetation over 18 inches in height would be removed to ensure clearance for the PV panels (which are built low to the ground). The project is expected to come online in a phased manner of a 12-24 –month period with the first phase completed in late 2013; the entire project is to be completed by the end of 2014 to coincided with the planned startup of the Devers Palo Verde #2 transmission line. The construction workforce is expected to average 200 workers and peak at 500.	The site is expected to contain desert tortoise and Gila woodpecker, based on limited literature research only.
enXco, McCoy Soleil Project (CA 049490)	Approximately 10 miles north of Blythe	Yes	This is a 300 MW solar project using Solar Reserve's power tower technology. The project is proposed on a total BLM ROW of 13,959 acres (plus 136 acres for the transmission line). The project would include a 14-mile transmission line to the proposed Midpoint Substation south of I-10. The	The site is mostly creosote bush scrub and several special-status plants are considered possible on the site, including desert

Project Name	Location/Jurisdiction	Shown on Figure 14?	Project Description	Biological Resources that Occur or Potentially Occur Onsite
			project would involve a 2.5 square-mile heliostat (mirror) field with all the heliostats focused on a central 600-foot tall tower, of which the top 60 feet is the solar receiver. The sun's heat energy is used to power a conventional steam turbine; this Solar Reserve technology includes the use of molten salt for thermal storage which extends the time period during the day that the solar energy can generate electricity for the grid beyond the daytime hours. The project would temporarily disturb a total of 1911 acres during construction and 1808 acres permanently. Project construction is expected to take 30 months with commercial operation timed to coincide with the planned Devers Palo Verde #2 transmission line online date at the end of 2013. Construction manpower is expected to average approximately 250 and peak at 400-500. Operational manpower is estimated at 44 personnel. Access would be through the existing Arlington Mine Road.	tortoise and Harwood's milkvetch.
enXco, Desert Lily Soleil Project (CACA 49492)	Six miles north of Desert Center	Yes	This is a 100 MW photovoltaic power plant proposed on 1,216 acres of BLM ROW. The project would involve a 5-8 mile transmission line (an additional nearly 400 acres of BLM ROW) to the planned SCE substation near Desert Center [now referred to as the Red Bluff Substation]. According to the POD, the project would begin construction early in 2012 and become operational at the end of 2013. The construction workforce would average about 100 workers with a peak of approximately 300; 12 people would be required to operate and maintain the facility. Access to the site would be from Rice Road.	At the time of POD submittal, preliminary environmental studies were underway but no results were available; desert tortoise and the Coachella milkvetch were identified as special status species of concern.
Bullfrog Green Energy LLC, Big Maria Vista Solar Project (CACA 049702)	Approximately 12 miles northwest of Blythe	Yes	This 500 MW concentrated PV project is proposed on a total BLM ROW of 23,040 acres. The Project is proposed to be built in three 167 MW phases with each phase requiring a nine-month construction period. The three phases are expected to complete construction in early 2011, 2012, and 2013 respectively and common online in the middle of the same years. A total of approximately 1,200 acres is expected to be directly impacted by the project, about four percent of	The special status species considered likely to be encountered include the Colorado Desert fringe toed lizard, Palm Springs pocket mouse, Palm Springs round-tailed ground squirrel, as well as

Project Name	Location/Jurisdiction	Shown on Figure 14?	Project Description	Biological Resources that Occur or Potentially Occur Onsite
			the total ROW area. The project is expected to require a construction workforce of 35-50 and an operational work force of less than 20. The POD indicated that several transmission options are still under consideration.	desert tortoise and burrowing owl.
Chuckwalla Solar I LLC, Chuckwalla Solar I Project (CACA 048808)	Approximately one mile north of Desert Center, north of I-10	Yes	Chuckwalla Solar I is a 200 MW concentrated photovoltaic power plant. The Project is proposed on a 4083-acre BLM ROW and would be developed in several phases. The project plans to start construction at the beginning of 2011 and complete the first 25 MW phase in June 2011, the second 25 MW phase in December 2011, and two more 25 MW phases in June and December of 2012. The final 100 MW phase would be completed at the end of 20123. The project's point of interconnection with the regional grid would be at a new switchyard on the site that taps into an existing SCE 161 kV line site that crosses the site. The facility footprint would be approximately 125 acres. Construction employment would average approximately 150 workers and peak at as many as 250. Operation will require approximately 10 employees.	The site's dominant plant communities are desert dry wash woodland and Sonoran desert scrub. A biological resource assessment found no Federal or State threatened or endangered plant or wildlife species. No desert tortoises or ferruginous hawks were observed, but focused surveys are planned for DT, and the Coachella milkvetch and desert unicorn plants.
Solel, Mojave Solar Park/Desert Lily Project (CACA 049494)	Adjacent to the eastern boundary of Joshua Tree National Park and State Highway 177	Yes	The Mojave Solar Park (also referred to as "Desert Lily"), is proposed for a roughly 4,000-acre BLM ROW. The project will be a parabolic trough solar thermal facility with power output expected to be 500 MW, although the POD indicates that size and design were not finalized at the time of POD submittal. The facility solar fields (rows of parabolic mirrors) would cover approximately 3,000 acres. The facility would include a 10-mile natural gas pipeline and an 11-mile transmission line. Peak labor requirements were estimated at 1,800 with an average of approximately 800.	The site is described as being desert creosote brush.
7 Energy, Blythe Airport Solar 1 Project	East of the Solar Millennium Blythe project	No	This is a solar photovoltaic power generating facility being developed on 640 acres of property owned by the Blythe Airport. It currently is "in the environmental stages and anticipating a pretty aggressive construction timetable. ***<<Need additional info from applicant>>***	***<<Need additional info>>***

Project Name	Location/Jurisdiction	Shown on Figure 14?	Project Description	Biological Resources that Occur or Potentially Occur Onsite
Eagle Crest Energy Company, Eagle Crest Pumped Hydroelectric Storage Project (FERC Project 12509)	Eagle Mountain iron ore mine north of Desert Center, which is no longer in operation	No	In June 2009, Eagle Crest Energy (ECE) filed its Final Application with the Federal Energy Regulatory Commission for the proposed Eagle Mountain Pumped Storage project. The project would use off-peak energy to pump water from the lower reservoir to the upper reservoir during periods of low electrical demand and generate on-peak energy by conveying water from the upper to the lower reservoir through turbine generator units during periods of high electrical demand. The upper and lower reservoirs would be formed from existing mining pits; the facility would generally provide up to 1,300 MW. The project would involve a 13.5-mile transmission line to the planned Red Bluff Substation near Desert Center. Project construction is expected to take four years beginning in 2012. Peak construction would involve about 500 people.	<<***Need additional info***>>

STATE OF CALIFORNIA
ENERGY RESOURCES CONSERVATION AND DEVELOPMENT COMMISSION

In the Matter of:
APPLICATION FOR CERTIFICATION
for the *BLYTHE SOLAR POWER PROJECT*

Docket No. 09-AFC-6
PROOF OF SERVICE
(Revised 1/26/2010)

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DECLARATION OF SERVICE

I, Carl Lindner, declare that on June 16, 2010, I served and filed copies of the attached:

Biological Resources Technical Report

The original document, filed with the Docket Unit, is accompanied by a copy of the most recent Proof of Service list, located on the web page for this project at:

[http://www.energy.ca.gov/sitingcases/solar_millennium_blythe].

The document has been sent to the other parties in this proceeding (as shown on the Proof of Service list) and to the Commission's Docket Unit, in the following manner:

(*Check all that Apply*)

For service to all other parties:

___X__ sent electronically to all email addresses on the Proof of Service list;

_____ by personal delivery or by overnight delivery service or depositing in the United States mail at Camarillo, California with postage or fees thereon fully prepaid and addressed as provided on the Proof of Service list above to those addresses **NOT** marked "email preferred."

AND

For filing with the Energy Commission:

__X_ sending an original paper copy and one electronic copy, mailed and emailed respectively, to the address below (preferred method);

OR

_____ depositing in the mail an original and 12 paper copies, along with 13 CDs, as follows:

CALIFORNIA ENERGY COMMISSION
Attn: Docket No. 09-AFC-6
1516 Ninth Street, MS-4
Sacramento, CA 95814-5512

docket@energy.state.ca.us

I declare under penalty of perjury that the foregoing is true and correct.

Carl E. Lindner