| DOCKET | |
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| 09-AFC-7 | |
| DATE | MAY 14 2010 |
| RECD. | MAY 19 2010 |

May 17, 2010

Alan Solomon
Project Manager
California Energy Commission
1516 Ninth Street
Sacramento, CA 95814

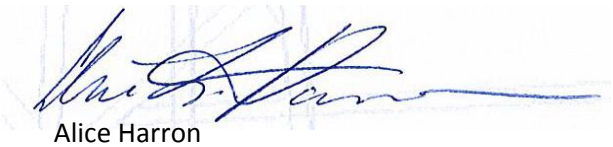
RE: **Palen Solar Power Project, Docket No. 09-AFC-7**
*Desert Tortoise Connectivity Letter*
*Technical Area: Biological Resources*

Dear Mr. Solomon:

Attached please find the following *Desert Tortoise Connectivity Letter.*

If you have any questions on this submittal, please feel free to contact me directly.

Sincerely,



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# Wildlife Movement and Desert Tortoise Habitat Connectivity

## Palen Solar Power Project

## Docket No. 09-AFC-7

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May 14, 2010

Ms. Susan Sanders
California Energy Commission
1516 Ninth Street
Sacramento, California 95814

**Subject: Wildlife Movement and Desert Tortoise Habitat Connectivity, Palen Solar Power Project (PSPP) Docket No. 09-AFC-7**

Dear Ms. Sanders:

The purpose of this letter is to present findings of surveys and analysis of wildlife movement along the Interstate 10 (I-10) corridor in the vicinity of the Palen Solar Power Project (PSPP or Project), and also to evaluate the potential effects of the PSPP on desert tortoise (*Gopherus agassizii*) movement and population connectivity. Mark Massar with the Bureau of Land Management (BLM) requested the wildlife movement analysis on March 25, 2010. Per the request of the BLM, AECOM, Inc. (AECOM) surveyed all potential wildlife underpasses on I-10 between the Desert Center exit to the west and the Wiley Wells Road exit to the east (32 miles). It was requested that each of these 24 crossings be evaluated in terms of suitability for use by different classes of wildlife (i.e., large mammal, small mammal, reptile). A memorandum summarizing the survey findings was prepared and delivered to BLM under separate cover on April 13, 2010. No comments have been received from BLM to date.

## Introduction

The proposed PSPP is located approximately 10 miles east of Desert Center, and 0.5 mile north of the I-10 corridor in eastern Riverside County, California. The Project would be located within a 5,212-acre right-of-way (ROW) owned by the Federal government and administered by the BLM. Environmental analysis of the Project presented in the Staff Assessment/Draft Environmental Impact Statement (SA/DEIS) determined there would be adverse effects to wildlife movement and genetic connectivity, particularly to species with normal dispersal distances smaller than the area of the project, including desert tortoise.

## Methods

Based on direction received from BLM, opportunities for wildlife species to cross under I-10 were inventoried along a 32-mile segment of the freeway running from Desert Center to Wiley Well (Figure 1). Underpasses were evaluated for potential wildlife use by AECOM wildlife biologists Dana Morin and Michael Anguiano on April 5, and April 6, 2010.

All potential underpasses were recorded using Geographical Positioning System (GPS) equipment. Each potential crossing was then accessed by hiking from truck trails south of I-10. The type of underpass (e.g., box culvert, bridge, etc.) was recorded and the four corners of each underpass structure were recorded with GPS. The length (distance from the southern approach to the northern approach) and width (distance between the walls of an

underpass) were calculated using Geographical Information System (GIS) software. In addition, the minimum height of each underpass was measured. The minimum height was used because many crossings were over washes with a natural substrate bottom and height varied with erosion through the underpass. These measurements were used to calculate an openness ratio for each underpass ([width x height]/length). An openness ratio indicates the relative openness of a structure. Larger openness ratios are typically more conducive to wildlife use. Existing ROW fencing at each underpass was evaluated to determine if fencing along I-10 could prevent wildlife access to underpasses.

Photographs were taken at each underpass of the southern and northern approaches. All photographs taken are included in the attached CD. Any animal sign detected in the immediate vicinity of an approach or in an underpass was recorded and additional notes were taken if an approach would not be suitable for a specific wildlife species. Factors that may increase or restrict potential use of a wildlife underpass were also recorded. Examples of such factors would be presence of desert dandelion (*Malacothrix glabrata*), a known forage species for desert tortoise, or if there was evidence of human presence.

Vegetation cover was estimated for the southern approach, the middle of the crossing, and the northern approach. Surveys were conducted during spring when annual cover was high, but only perennial species were used to estimate cover. Cover was estimated visually using the following categories:

- Bare = 0%
- Sparse = 5% - 15%
- Moderate = 15% - 30%
- Medium = 30% - 60%
- Dense = 60% - 85%

Dominant perennial species were identified to genus and listed for the southern approach, middle of the crossing, and northern approach of each crossing.

**Results**

The location of each underpass is shown in Figure 1. Variables for each underpass are listed in the GIS database included on the CD with this submittal. A total of 24 underpasses were surveyed over 30 miles along I-10. Twenty-one of the 24 underpasses are open span bridges with openings in the median and wash habitat throughout. Sizes of the open span bridges varied from 10.7 to 59.4 meters in width, 2.2 to 4.5 meters in height, and 56.7 to 97.8 meters in length. Openness ratio for the open span bridges varied from 0.5 to 3.4, all of which indicate potential use for all wildlife species in the area.

Overall, two types of fencing were present along the I-10 ROW: 5-strand barbed wire and fencing with square netting chicken wire (openings 6 inches by 6 inches) at the bottom and 2 to 3 strands of barbed wire from 1.5 meters to the top of the fence. Both fencing types were approximately 2 meters in height. At most underpasses fencing is either cut away for the

width of the crossing or cut away for at least one 3-meter segment at each approach. In addition, the fencing is not suitable to prevent access to the roadway as wildlife can easily move over or under it and the fencing does not funnel wildlife to the underpass openings, but allows access to the roadway. In addition, fencing in the openings between spans is often missing or in disrepair and thus allows access to the median and roadway.

Wildlife species detected at the undercrossings included lizards, rodent (*Peromyscus* sp., *Dipodomys* sp., *Neotoma* sp.), rabbit (*Sylvilagus* sp.), roadrunner (*Geococcyx californianus*), ground squirrel (*Spermophilus* sp.), fox, and coyote (*Canis latrans*). Bobcat (*Lynx rufus*) and mule deer (*Odocoileus hemionus*) sign were detected to the south of several underpasses to the west of PSPP.

In general, the washes on the western side of the 32-mile survey segment have greater cover and diversity with more distinct hydrology than those to the east. The northern approaches to the east were often dominated by grasses and mustard species, providing little protection for wildlife. Dominant perennial plant species identified at underpasses includes cheesebush (*Hymenoclea salsola*), brickellbush (*Brickellia* sp.) scorpion weed (*Phacelia* sp.), *Psorothamnus* sp., cattle saltbush (*Atriplex polycarpa*), brittlebush (*Encelia farinosa*), white bursage (*Ambrosia dumosa*), creosote (*Larea tridentata*), mesquite, ironwood (*Olneya tesota*), and palo verde.

Five underpasses (10, 11, 12, 13, and 14) were surveyed in the immediate vicinity of the PSPP (Figure 2). Figure 2 also includes the boundary of the proposed PSPP and the Reconfigured Alternative disturbance area and DT observations gathered during protocol surveys conducted by AECOM in 2009 and 2010. All five underpasses in the vicinity of the PSPP are open span bridges with openings in the median and wash habitat throughout.

Underpass 10 (Figure 1, Sheet 3) is located to the southwest of the PPSP. It is 3.0 meters in height, 30.1 meters wide, and 60.3 meters in length resulting in an openness ratio of 1.5, suitable for all wildlife species in the area. There is 5-strand barbed-wire fencing between spans on the median, but the fencing has been cut at either approach. In addition, the fencing is not suitable to prevent access to the roadway as wildlife can easily move over or under it. There is moderate vegetative cover in the wash to the south and between spans including *Psorothamnus* sp. and cheesebush (*Hymenoclea salsola*). Additionally, there is ironwood (*Olneya tesota*), mesquite (*Prosopsis glandulosa*), and palo verde (*Cercidium floridum*) in the wash to the north. Coyote (*Canis latrans*) and rodent (*Peromyscus* sp.) tracks were found through the underpass.

Underpass 11 (Figure 1, Sheet 4) is located south of the PSPP. It is 3.3 meters in height, 24.3 meters wide, and 58.4 meters in length resulting in an openness ratio of 1.4, suitable for all wildlife species in the area. The 5-strand barbed-wire fencing has been cut at both approaches and is not suitable to prevent access to the roadway as wildlife can easily move over or under it. There is no ROW fence between spans, and the western side of the underpass between spans slopes gently up to the roadway, providing easy access to all wildlife species. The southern approach and area between the spans has dense vegetative

cover including cheesebush, *Psorothamnus* sp., creosote (*Larea tridentata*), and palo verde. The northern approach to the wash has moderate vegetative cover including *Psorothamnus* sp. cheesebush and ironwood. Coyote, rodent, rabbit (*Sylvilagus* sp.), lizard, and roadrunner (*Geococcyx californianus*) tracks were found through the underpass.

Underpass 12 (Figure 1, Sheet 4) is located to the south of the PSPP. It is 3.3 meters in height, 17.3 meters wide, and 57.8 meters in length resulting in an openness ratio of 1.0, suitable for all wildlife species in the area. The 5-strand barbed-wire fencing has been cut at either approach and is not suitable to prevent access to the roadway as wildlife can easily move over or under it. There is no ROW fence between spans. The southern approach contains moderate, diverse shrub cover including cheesebush, cattle saltbush (*Atriplex polycarpa*), and white bursage (*Ambrosia dumosa*). Between spans is sparsely vegetated with cheesebush and creosote and the northern approach has moderate cover including cheesebush and mesquite. Coyote, rodent, rabbit (*Sylvilagus* sp.), and lizard tracks were found through the underpass.

Underpass 13 (Figure 1, Sheet 5) is located to the southeast of the PSPP. It is 3.0 meters in height, 23.2 meters wide, and 56.9 meters in length resulting in an openness ratio of 1.2, suitable for all wildlife species in the area. The 5-strand barbed-wire fencing has been cut at either approach and is not suitable to prevent access to the roadway as wildlife can easily move over or under it. There is no ROW fence between spans. The southern approach contains moderate shrub cover including cheesebush, white bursage, and mesquite. There is sparse cover between spans including *Psorothamnus* sp. and cheesebush. The northern approach is open with a few large *Psorothamnus* sp. and mesquite. Coyote, rodent, rabbit, ground squirrel (*Ammospermophilus* sp.) and lizard tracks were found through the underpass.

Underpass 14 (Figure 1, Sheet 5) is located to the southeast of the PSPP beyond the eastern border of the Project footprint. The location of underpass 14 is in an area where the distance between the Palen Mountains and habitat to the south of I-10 is shortest, representing an area with a relatively high likelihood of movement between these areas. It is 4.5 meters in height, 10.7 meters wide, and 60.1 meters in length resulting in an openness ratio of 0.8, suitable for all wildlife species in the area. The 5-strand barbed-wire fencing extends across the southern approach but has been cut at the northern approach. The fencing is not suitable to prevent access to the roadway as wildlife can easily move over or under it. There is no ROW fence between spans. The southern approach contains moderate shrub cover including cheesebush and *Psorothamnus* sp. The wash is bare and sandy between spans and the northern approach is open with a few large *Psorothamnus* sp., palo verde and mesquite. Coyote, rodent, roadrunner, and lizard tracks were found through the underpass.

**Conclusions**

While current underpasses are located at washes for hydrological reasons, all habitat to the north and south of I-10 is suitable for wildlife habitation and movement. Thus, these

underpasses provide connectivity and safe movement corridors between the habitat to the north and south of the I-10 corridor. However, there is likely attempted movement in upland areas as well. Current fencing does not keep wildlife from accessing I-10 or funnel animals to the underpasses.

Implementation of the PSPP would not affect undercrossings in the project vicinity. All would remain open and DT could still cross under I-10. No evidence of DT use of the undercrossings was detected during the survey. There are 24 underpasses occurring along the existing washes in the 32-mile stretch between Wiley Wells Road and Desert Center that could facilitate movement of a migrating DT in a north-south direction (see Figure 1). Although DT are more likely to utilize movement corridors to the west and east of the PSPP (discussed in more detail below), the proposed DT-proof fencing along the perimeter of the solar fields, as required by conditions proposed in the SA/DEIS, could impede DT movement. The Applicant therefore proposes to install a large box culvert underneath the project access road to facilitate the movement of DT and other wildlife (see location on Figure 2). The culvert will connect the undercrossings south of the PSPP with open areas to the west.

The shortest distance between higher value habitat in the Palen and Chuckwalla Mountains is to the east of the Project disturbance area. Results of 2010 DT buffer surveys, which were conducted further east than in 2009 near the base of the Palen Mountains, suggest greater DT activity in this area as compared to the PSPP study area. Additionally, the shortest distance to higher value habitat likely near the Eagle and Coxcomb Mountains is west of the Project disturbance area. Underpasses to the west and east of the Project disturbance area would continue to facilitate movement to these areas despite project implementation (see Figure 1).

It was determined that there are many points along I-10 suitable for wildlife undercrossing, including by desert tortoise. The proposed PSPP would place a barrier a short distance north of two of these crossings. Examining these particular undercrossings in a regional context, however, suggests that they may be less important than other available undercrossings to the east and west of the PSPP. As was discussed in the draft SA/DEIS, the PSPP site is located on the margins of a sand transport zone. To the north of the site sand dunes occur with increasing frequency as a result of the northwest to southeast orientation of the sand transport system. Further north is the Palen Dry Lake which is inhospitable for tortoises. While desert tortoises will cross desert pavement and dunes, areas of heavy dune concentration and areas consisting purely of dunes offer little in the way of forage and make burrowing difficult. These areas are likely not a regular part of tortoises' home ranges.

The need to retain routes providing opportunities for movement of tortoises between populations south of I-10 and areas further north is understood. This movement, ultimately providing connection and exchange of genetic material between desert tortoise populations, would likely occur, assuming suitable climatic conditions, through the combination of juvenile dispersal and gradual northerly and/or southerly expansion of the home ranges of succeeding generations of tortoises. The placement of the PSPP does not block areas important for this home range expansion. Tortoises moving north from south of I-10 would

confront an obstacle in the form of dunes and the Palen Dry Lake. The same features provide a barrier to tortoises moving south from northern portions of the Chuckwalla Valley. Tortoises seeking to establish new home ranges in this region would be forced into the bajada to the west of the proposed PSPP or to areas at the foot of the Palen Mountains to the east of the dunes. The placement of the PSPP, surrounded by tortoise fencing, simply places a more definitive barrier further south in an area that likely does not function as an effective desert tortoise movement corridor due to physiographic features. Additionally, the shortest distance between higher value habitat in the Palen and Chuckwalla Mountains is several miles to the east of the Project disturbance area. The shortest distance between the Chuckwalla Mountains to higher value habitat likely near the Eagle and Coxcomb Mountains is west of the Project disturbance area.

The placement of the PSPP north of I-10 will not significantly impact desert tortoise movement and population connectivity. Such movement, and the resultant connectivity, would occur via routes to the east and west of the PSPP due to the presence of extensive dune systems and Palen Dry Lake. Ample undercrossings (more than 20), completely unaffected by the proposed PSPP, exist to facilitate this movement across I-10. As an additional measure to facilitate desert tortoise movement, the applicant agrees to install a concrete box culvert under the access road leading to the site from the Corn Springs interchange (see Figure 2). This will prevent tortoises from becoming enclosed in an area bounded by the highway and the PSPP tortoise fence.

Sincerely,

Mr. William Graham
Principal
AECOM

Enclosures: Figure 1. I-10 Wildlife Crossing Analysis in the Project Vicinity
Figure 2. Desert Tortoise Observations and Wildlife Connectivity
CD. Photos of underpasses, Shapefiles and Metadata

cc: Alan Solomon, CEC
Larry LePre, Bureau of Land Management
Alice Harron, Solar Millennium

Desert Center

Sheet 1

Sheet 2

Sheet 3

Sheet 4

Sheet 5

Sheet 6

Sheet 7

Sheet 8

Sheet 9

Wiley's Well

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 24

CHUCKWALLA VALLEY

CHUCKWALLA MOUNTAINS

Map Location


Legend

- Project Disturbance Area
- Access Routes
- Crossings Under I-10
- Map Extent

Source: ESRI 2010; AECOM 2010

1 inch = 2 miles

Miles

0 1 2 4

**Palen Solar Power Project**
**Figure 1**
**I-10 Wildlife Crossing Analysis in the Project Vicinity**

AECOM

Date: April 2010

Path: P:\2009\09080081 Sol Mil Palen\6.0 GIS\6.3 Layout\Reports\CEC_Staff_Assessment\PSPP_CrossingsUnderI10_Overview.mxd, 04/13/10, SteinB


Map Location


Legend

- Crossings Under I-10
- Washes Within 500-feet of Crossing
- Access Routes

Source: ESRI 2010; AECOM 2010

N
W
E
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1 inch = 1,000 feet

0 1,000 2,000 Feet

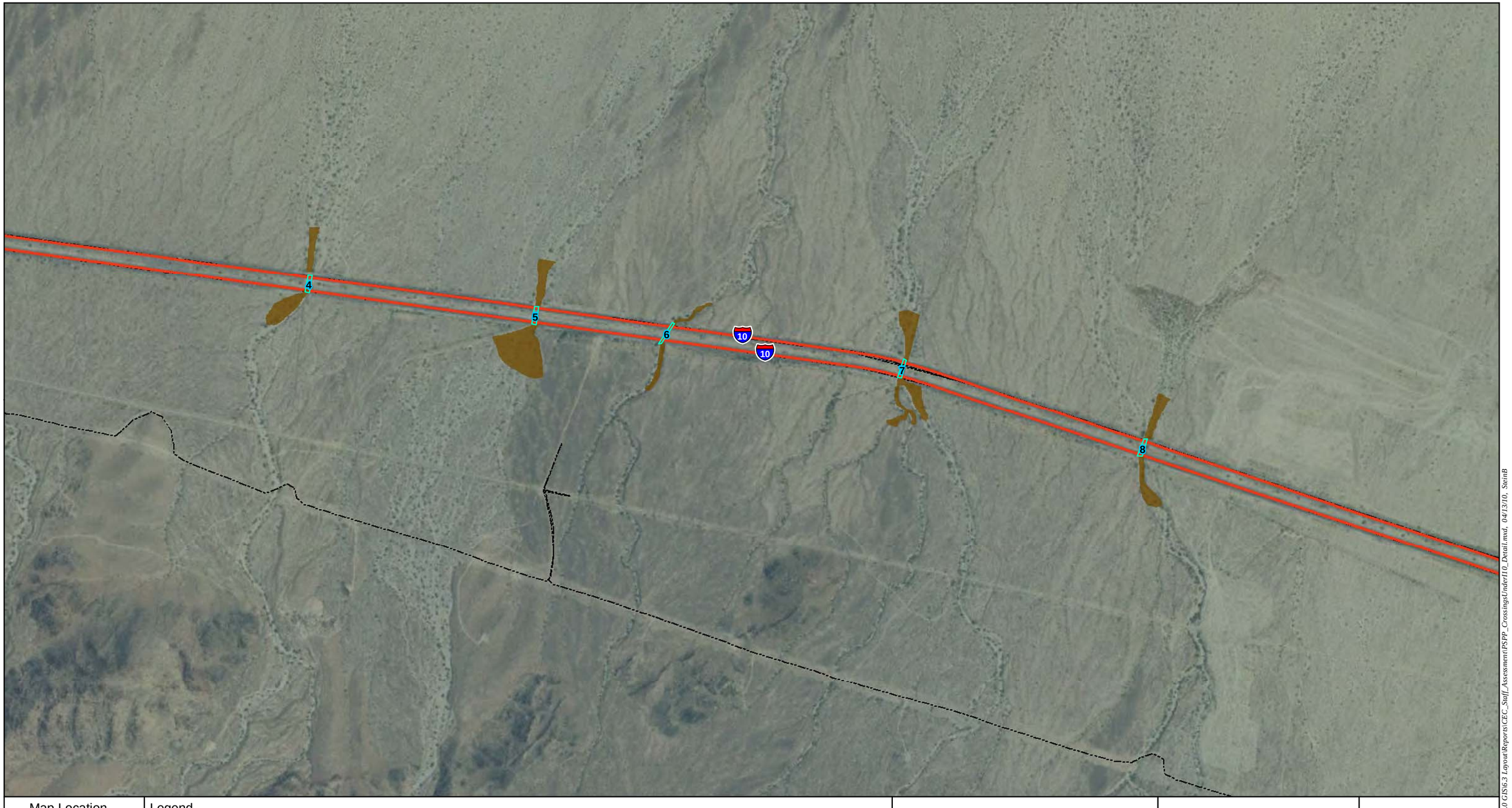
**Palen Solar Power Project**
**Figure 1**
**I-10 Wildlife Crossing Analysis in the Project Vicinity**

Sheet 1

AECOM

Date: April 2010

Path: P:\2009\09080081 Sol Mil Palen\6.0 GIS\6.3 Layout\Reports\CEC_Staff_Assessment\PSPP_CrossingsUnder110_Detail.mxd, 04/13/10, SteinB




Map Location


Legend

- Crossings Under I-10
- Washes Within 500-feet of Crossing
- Access Routes

Source: ESRI 2010; AECOM 2010

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1 inch = 1,000 feet

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**Palen Solar Power Project**
**Figure 1**
**I-10 Wildlife Crossing Analysis in the Project Vicinity**

Sheet 2

AECOM

Date: April 2010

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**Figure 1**

Map Location


Legend

- Crossings Under I-10
- Washes Within 500-feet of Crossing
- Access Routes

Source: ESRI 2010; AECOM 2010

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1 inch = 1,000 feet

0 1,000 2,000 Feet

**Palen Solar Power Project**
**Figure 1**
**I-10 Wildlife Crossing Analysis in the Project Vicinity**

Sheet 3

AECOM

Date: April 2010

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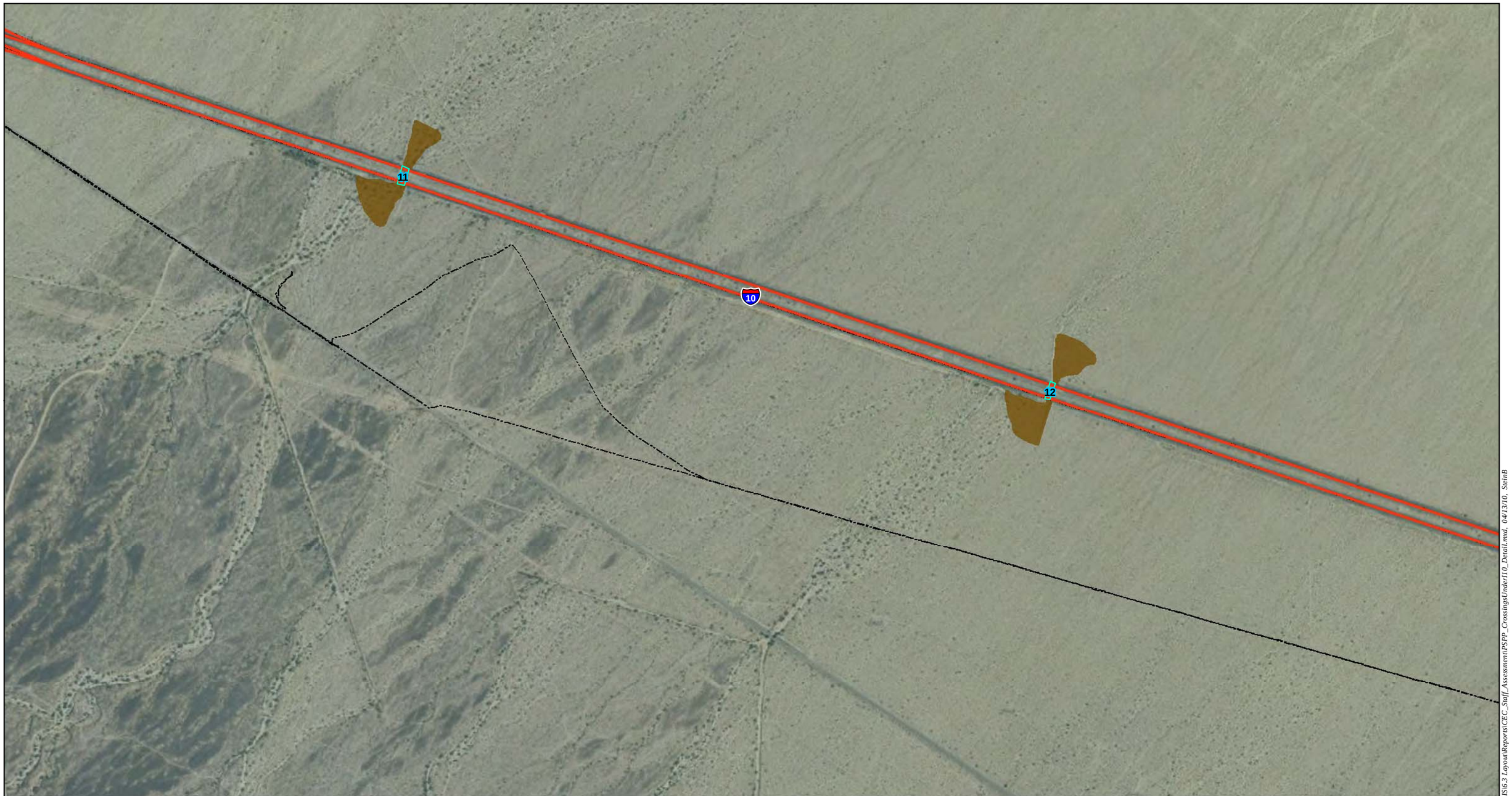


Map Location


Legend

- Crossings Under I-10
- Washes Within 500-feet of Crossing
- Access Routes

Source: ESRI 2010; AECOM 2010

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1 inch = 1,000 feet

0 1,000 2,000 Feet

**Palen Solar Power Project**
**Figure 1**
**I-10 Wildlife Crossing Analysis in the Project Vicinity**

Sheet 4

AECOM

Date: April 2010

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Map Location


Legend

- Crossings Under I-10
- Washes Within 500-feet of Crossing
- Access Routes

Source: ESRI 2010; AECOM 2010

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1 inch = 1,000 feet

0 1,000 2,000 Feet

**Palen Solar Power Project**
**Figure 1**
**I-10 Wildlife Crossing Analysis in the Project Vicinity**

Sheet 5

AECOM

Date: April 2010

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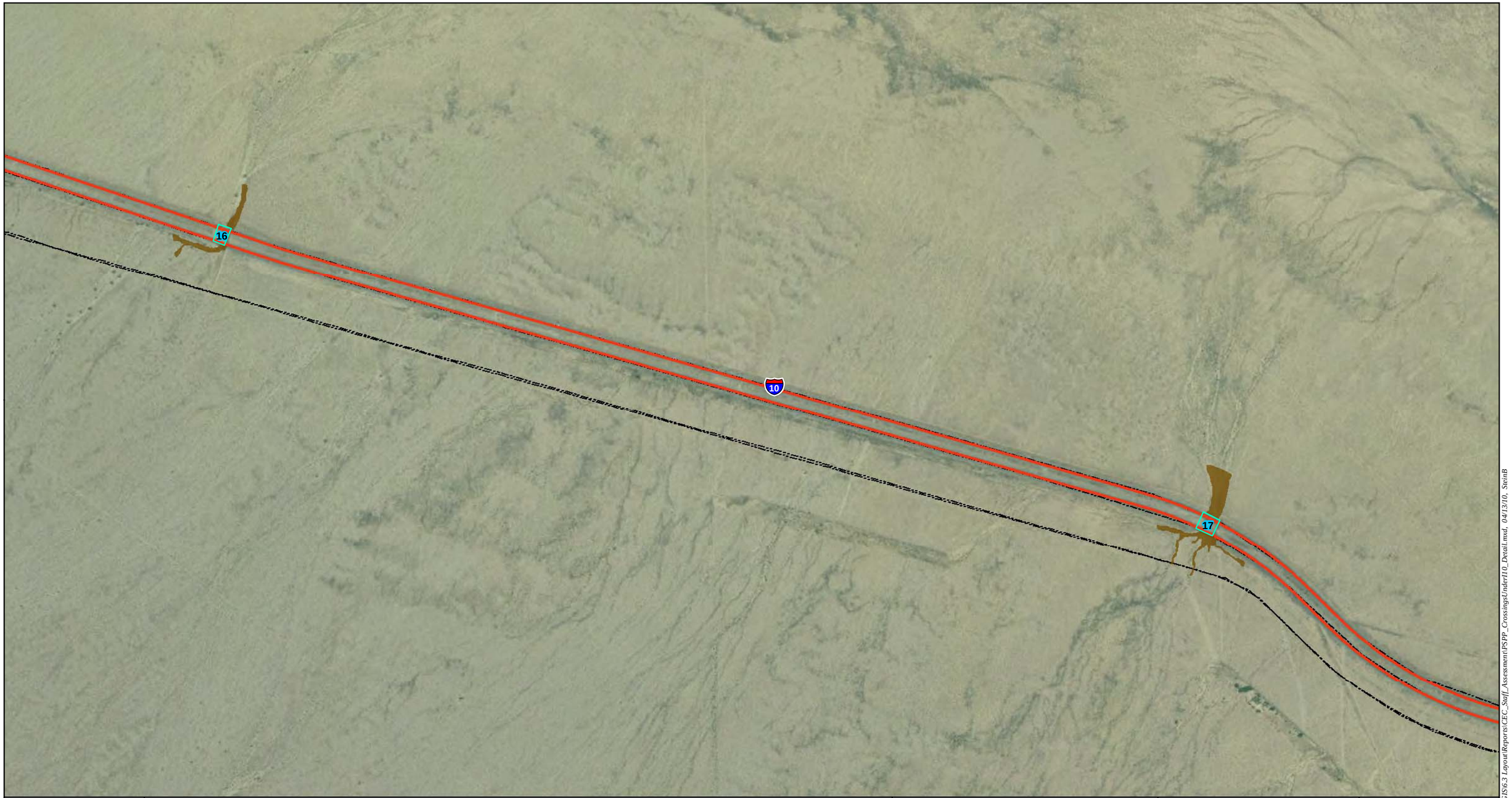


Map Location


Legend

- Crossings Under I-10
- Washes Within 500-feet of Crossing
- Access Routes

Source: ESRI 2010; AECOM 2010

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1 inch = 1,000 feet

0 1,000 2,000 Feet

**Palen Solar Power Project**
**Figure 1**
**I-10 Wildlife Crossing Analysis in the Project Vicinity**

Sheet 6

AECOM

Date: April 2010

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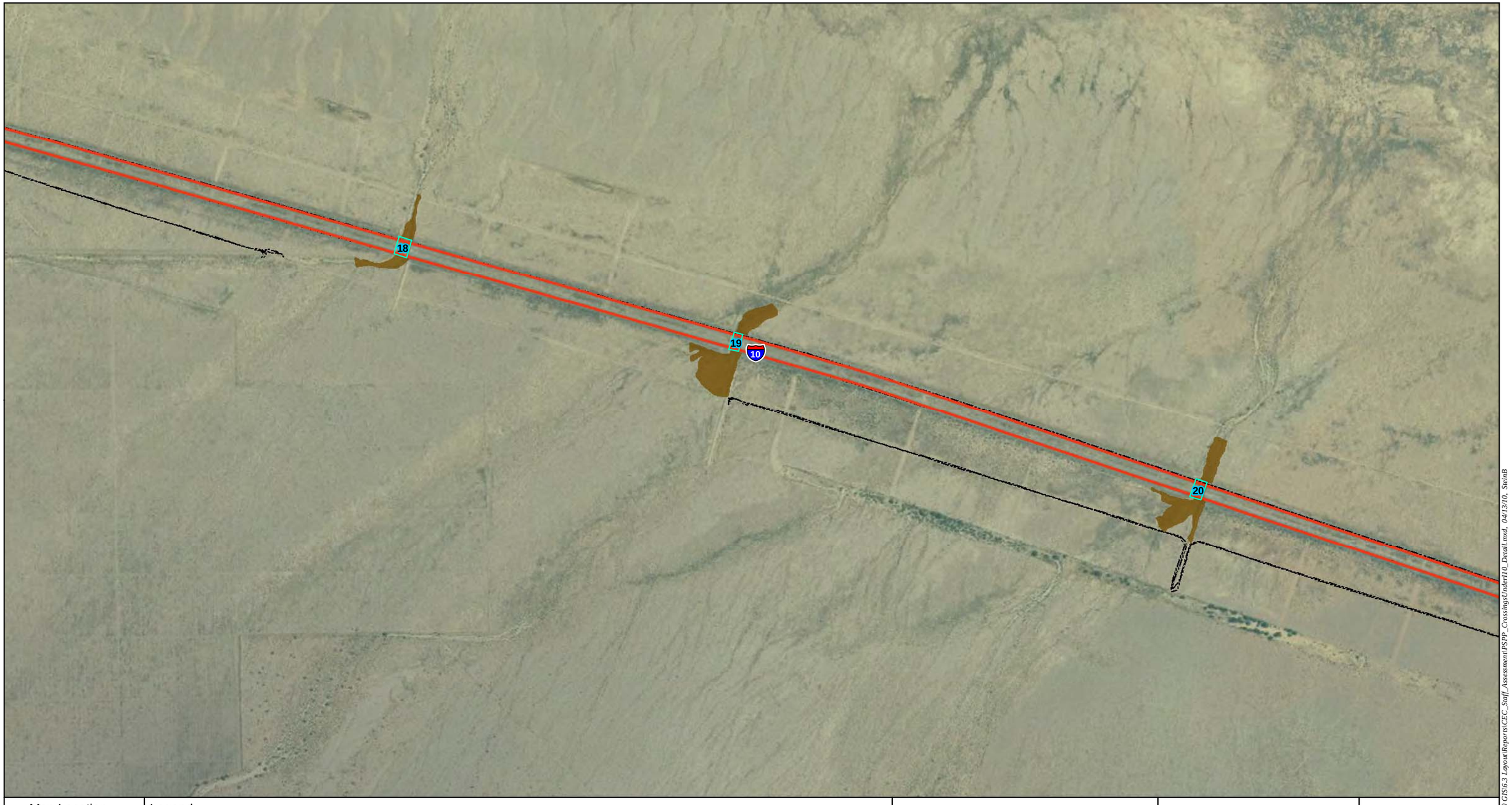


Map Location


Legend

- Crossings Under I-10
- Washes Within 500-feet of Crossing
- Access Routes

Source: ESRI 2010; AECOM 2010

N
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1 inch = 1,000 feet

0 1,000 2,000 Feet

**Palen Solar Power Project**
**Figure 1**
**I-10 Wildlife Crossing Analysis in the Project Vicinity**

Sheet 7

AECOM

Date: April 2010

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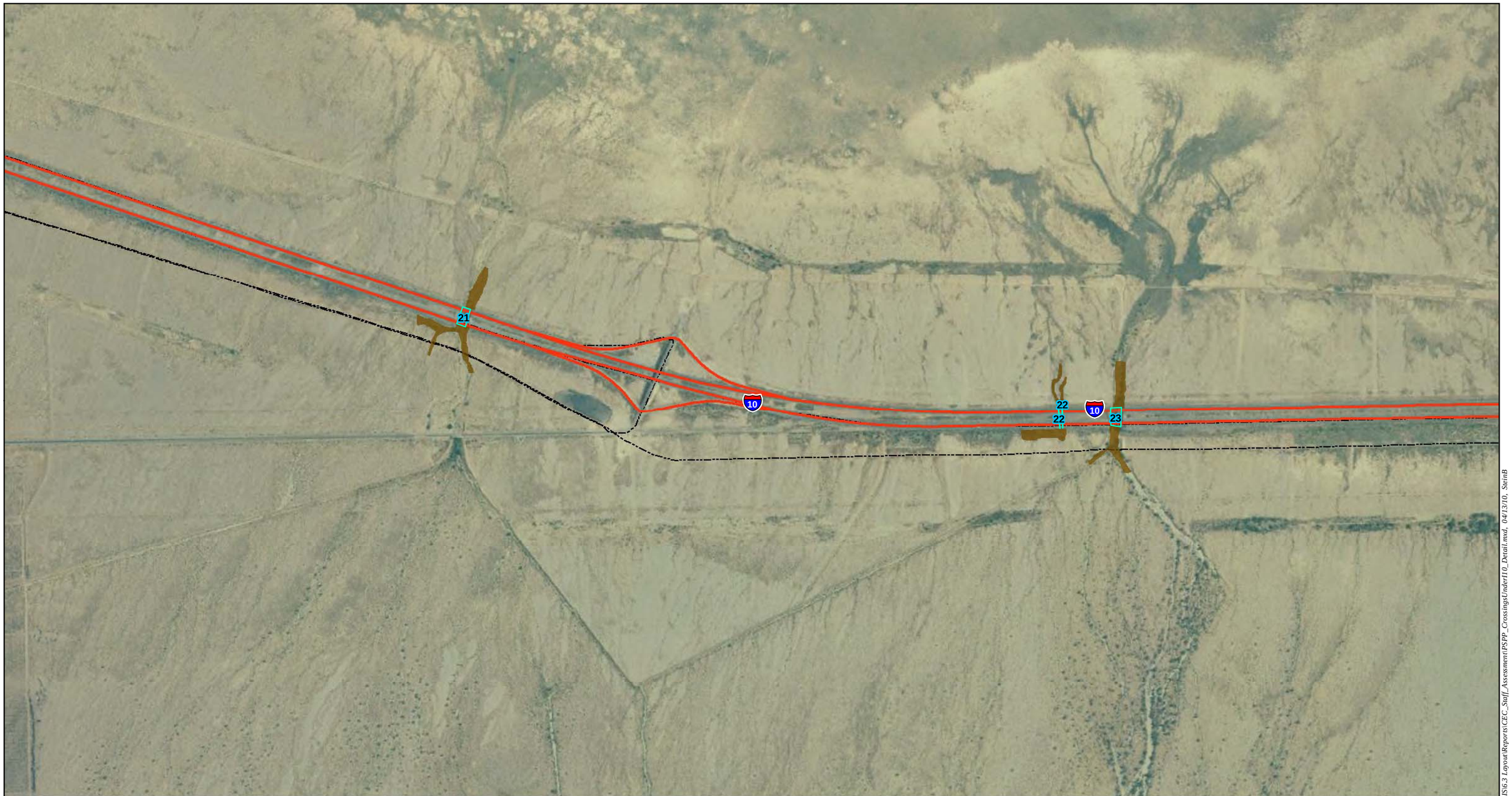


Map Location


Legend

- Crossings Under I-10
- Washes Within 500-feet of Crossing
- Access Routes

Source: ESRI 2010; AECOM 2010

N
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1 inch = 1,000 feet

0 1,000 2,000 Feet

**Palen Solar Power Project**
**Figure 1**
**I-10 Wildlife Crossing Analysis in the Project Vicinity**

Sheet 8

AECOM

Date: April 2010

Path: P:\2009\09080081 Sol Mil Palen\6.0 GIS\6.3 Layout\Reports\CEC_Staff_Assessment\PSPP_CrossingsUnderI10_Detail.mxd, 04/13/10, SteinB


Map Location


Legend

- Crossings Under I-10
- Washes Within 500-feet of Crossing
- Access Routes

Source: ESRI 2010; AECOM 2010

N
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1 inch = 1,000 feet

0 1,000 2,000 Feet

**Palen Solar Power Project**
**Figure 1**
**I-10 Wildlife Crossing Analysis in the Project Vicinity**

Sheet 9

AECOM

Date: April 2010

Path: P:\2009\09080081 Sol Mil Palen\6.0 GIS\6.3 Layout\Reports\CEC_Staff_Assessment\PSPP_CrossingsUnderI10_Detail.mxd, 04/13/10, SteinB

Location of Proposed Crossing

Sheet 4

Project Disturbance Area
Reconfigured Alternative
BRSA
Crossings Under I-10

Map Location


Legend

DETO Observations
(as of May 11, 2010)
- Adult Tortoise
- Juvenile Tortoise
- Tortoise Burrow (Active) - Class 1
- Tortoise Burrow - Class 2
- Tortoise Burrow - Class 3
- Tortoise Burrow - Class 4 or 5
- Tortoise Scat - Class 1
- Tortoise Scat - Class 2
- Tortoise Scat - Class 3
- Tortoise Scat - Class 4
- Tortoise Carcass - Class 3
- Tortoise Carcass - Class 4
- Tortoise Pallet (Active) - Class 1
- Tortoise Pallet - Class 4 or 5
- Tortoise Tracks
- Tortoise Bone Fragment - Mineralized
- Tortoise Bone Fragment - Not Mineralized

Source: ESRI 2010; AECOM 2010

N
W E
S

1 inch = 2,500 feet

0 2,500 5,000 Feet

**Palen Solar Power Project**

**Figure 2**
**Desert Tortoise Observations and Wildlife Connectivity**

AECOM

Date: May 2010

Path: P:\2009\09080081 Sol Mil Palen\6.0 GIS\6.3 Layout\Reports\CEC_Staff_Assessment\PSPP_Desert_Tortoise_Observations_and_Wildlife_Connectivity_May2010.mxd, 05/12/10, NdemoM

**STATE OF CALIFORNIA**
**ENERGY RESOURCES CONSERVATION AND DEVELOPMENT COMMISSION**

| | |
|---|---|
| ***In the Matter of:***<br>**APPLICATION FOR CERTIFICATION**<br>**for the *PALEN SOLAR POWER PROJECT*** | **Docket No. 09-AFC-7**<br>**PROOF OF SERVICE**<br>***(Revised 5/14/2010)*** |

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## DECLARATION OF SERVICE

I, Carl Lindner, declare that on, May 17, 2010, I served and filed copies of the attached **Palen Desert Tortoise Connectivity Report,** dated May 14, 2010 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_palen]**.
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:**

_____ sent electronically to all email addresses on the Proof of Service list;

__**X**__ 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 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-7
1516 Ninth Street, MS-4
Sacramento, CA 95814-5512

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I declare under penalty of perjury that the foregoing is true and correct.